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• BCA 6545, MCA 6545, B.Voc 6545

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DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

ABOUT THE DEPARTMENT

The **Electronics and Computer Engineering Department** is one of the most vibrant and evolving departments of **Arvind Gavali College of Engineering**. The department is backed by a team of well-qualified and UGC-approved faculty members dedicated to providing quality education. It is equipped with modern laboratories and facilities that support hands-on learning and innovation.

With the increasing demand for skilled engineers in domains such as electronics, embedded systems, software development, networking, and automation, the department is committed to producing industry-ready graduates. The academic curriculum is designed to ensure strong theoretical foundations, combined with real-world applications through practical work and project-based learning.

To enhance professional readiness, the department emphasizes industry exposure by arranging internships, industrial visits, workshops, and expert talks. This bridges the gap between classroom learning and industry expectations. The department also focuses on the development of software and hardware skills essential in today's technology-driven world. The department continues its mission to shape students into competent, ethical, and innovative engineers capable of contributing to the fast-changing global technology landscape.

"Innovation begins with Electronics, and Transformation happens through Computing."

DEPARTMENT VISION

To emerge as a leading department in Electronics and Computer Engineering, developing skilled and innovative engineers to serve the needs of industry and society through technology and ethical practice.

DEPARTMENT MISSION

M1	To enrich academic excellence by imparting quality education that fosters intellectual and technical growth.
M2	To nurture essential skills and capabilities in students, empowering them to succeed and thrive in their personal and professional endeavors.
M3	To instill social responsibility, ethical values, and environmental consciousness among students for sustainable development.

DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES (PEO)	
PEO 1	Graduates will be able to apply fundamental concepts of mathematics, science, and engineering to analyze and solve industrial and societal problems.
PEO 2	Graduates will develop effective solutions for real-world challenges by utilizing modern engineering tools, technical expertise, and soft skills.
PEO 3	Graduates will demonstrate professionalism with a strong sense of ethics, societal responsibility, and environmental awareness, contributing positively to the IT and automation engineering domains.

PROGRAM OUTCOMES (PO)	
PO 1	Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO 2	Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO 3	Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO 4	Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8)
PO 5	Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO 6	The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO 7	Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

PO 8	Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO 9	Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO 10	Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO 11	Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO 1	Graduates will be able to learn the advancements in the area of software and electronics.
PSO 2	Graduates will be capable of developing software and electronic systems that address real-world problems with a focus on societal needs and environmental sustainability.

MAPPING OF PEO's TO PO's

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11
PEO 1	3	3	0	2	2	2	0	0	0	0	1
PEO 2	2	2	3	2	3	0	0	2	2	3	2
PEO 3	0	0	0	0	0	3	3	2	2	2	2

MAPPING OF PEO's TO PSO's

	PSO 1	PSO 2
PEO 1	2	3
PEO 2	2	3
PEO 3	1	3

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DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

A. Definition of Credit:

1 Hr. Lecture (L) per week 1	**1 credit**
1 Hr. Tutorial (T) per week	**1 credit**
1 Hr. Practical (P) per week	**0.5 credits**
2 Hours Practical (Lab)/week	**1 credit**

B. Range of Credits:

A range of credits from 160 to 176 for a student to be eligible to get undergraduate degree in engineering. Student will be eligible to get undergraduate degree with honors 18 credits and/or minors 14 credits, if one completes additional credits.

C. Structure & Definition:

SR.NO	DEFINATION	CODE
1.	Basic Science Course	BSC
2.	Engineering Science Course	ESC
3.	Program Core Courses	PCC
4.	Program Elective Course	PEC
5.	Multi Minor	MDM
6.	Open Elective	OE
7.	Vocational and Skill Enhancement Course	VSEC
8.	Ability Enhancement Course	AEC
9.	Entrepreneurship /Economics/ Management Courses (Mgt./Economics/Mkt./Finance)	EEM
10.	Indian Knowledge System	IKS
11.	Value Education Course	VEC
12.	Research Methodology (Project)	ECL
13.	Common Egg. Project/Field Project (PBL/Seminar/Mini Project)	
14.	Project	
15.	Internship/OJT (PBL/Seminar/Mini Project/Virtual Internship/Physical)	
16.	Co-curricular Courses	CC

D. Credit Framework:

The minimum and maximum credit structure for different levels under the Four-year Bachelor's UG Programme with multiple entry and multiple exit options are as given below:

Level	Qualification Title	Credit Requirements		Semester	Year
		Minimum	Maximum		
4.5	One Year UG Certificate in Engg./ Tech.	40	44	2	1
5.0	Two Years UG Diploma in Engg./ Tech.	80	84	4	2
5.5	Three Years Bachelor's Degree in Vocation (B.Voc.) or B. Sc. (Engg./ Tech.)	120	124	6	3
6.0	4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg./ Tech. with Multidisciplinary Minor	160	164	8	4

Credits offered per Semester will be a minimum 20 and a maximum 22. While minimum credits are mandatory as per National Credit Framework, the Universities and Autonomous Engineering Colleges can evolve the mechanism for providing Semester/ Level wise credit attainment flexibility within the broad framework.

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E. Structure Categories of UG Program:

As per NEP Guidelines Proposed Scheme of Credit Distribution

	Year	FY		SY		TY		B. Tech.			
Sr. No.		I	II	III	IV	V	VI	VII	VIII	Actual	NEP Guidelines
1	Basic Science Course	8	8	--	--	--	--	--	--	16	14-18
2	Engineering Science Course	7	5	--	--	--	--	--	--	12	12-16
3	Program Core Courses	--	02	15	14	10	12	07	--	60	44-56
4	Program Elective Course	--	--	--	--	03	03	09	--	15	20
5	Multi Minor	--	--	03	03	03	03	02	--	14	14
6	Open Elective	--	--	02	03	03	--	--	--	08	08
7	Vocational and Skill Enhancement Course	01	04	--	--	01	01	--	--	07	08
8	Ability Enhancement Course	03	--	--	01	--	--	--	--	04	04
9	Entrepreneurship /Economics/ Management Courses (Mgt./Economics/Mkt./Finance)	--	--	--	--	--	--	--	03	03	04
10	Indian Knowledge System	--	02	--	--	--	--	--	--	02	02
11	Value Education Course	--	--	01	01	--	--	--	--	02	04
12	Research Methodology (Project)		--	--	--	--	--	--	04	04	04
13	Common Egg. Project/Field Project (PBL/Seminar/Mini Project)	--	--	--	--	01	--	--	--	01	02
14	Project	--	--	--	--	--	01	03	--	04	04
15	Internship/OJT (PBL/Seminar/Mini Project/Virtual Internship/Physical)	--	--	--	--	--	--	--	12	12	12
16	Co-curricular Courses	01	01	--	--	--	--	--	--	02	04
	Total Credits	20	22	21	22	21	20	21	19	**166**	
	Examination Total	900	900	950	1000	950	950	900	300	**6850**	
	Total Working Hours	26	27	25	26	25	24	26	37	**216**	
	NEP Guidelines	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**		**160-176**

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F. Semester wise credit distribution:

First Year B. Tech-2026-27(Common to all Branches, for Group A & B) **SEMESTER I**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	BSC	25BSE1101	Engineering Mathematics: Calculus and Algebraic Techniques	3	1	0	4	4	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	BSC	25BSE1001/ 25BSE1002	Engineering Physics/Modern Chemistry	3	0	0	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	ESC	25BSE1102	Basic Electrical & Electronics Engineering	3	0	0	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	ESC	25BSE1103	C Programming for Problem Solving	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	AEC	25BSE1104	Communication Skills	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	BSC	25BSE1001L/ 25BSE1002L	Engineering Physics Laboratory / Modern Chemistry Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
7	ESC	25BSE1102L	Basic Electrical & Electronics Engineering Laboratory	0	0	2	2	1	CA1	25		40
									CA2	25		
									OE	50	20	
8	ESC	25BSE1103L	C Programming for Problem Solving Laboratory	0	0	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
9	AEC	25BSE1104L	Communication Skills Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
10	VSEC	25BSE1105L	Engineering Practice Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
11	CC	25BSE1106L	Yoga	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
			Total	**13**	**1**	**12**	**26**	**20**		**900**		
Total Contact Hours –26 Total Credits – 20												

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First Year B. Tech-2026-27(Common for all Branches, for Group A & B) **SEMESTER II**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	BSC	25BSE1201	Engineering Mathematics: Calculus and Transform Methods	3	1	0	4	4	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	BSC	25BSE1001/ 25BSE1002	Engineering Physics/Modern Chemistry	3	0	0	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	ESC	25BSE1202	Engineering Mechanics	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	ESC	25BSE1203	Python Programming	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	VSEC	25BSE1204	Computer Aided Engineering Drawing	2	0	0	2	2	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
6	PCC	25PCC1201	Fundamentals of Industry Evolution	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	IKS	25BSE1205	Energy, Ecology & Environment	2	0	0	2	2	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
8	BSC	25BSE1001L/ 25BSE1002L	Engineering Physics Laboratory /Modern Chemistry Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
9	ESC	25BSE1203L	Python Programming Laboratory	0	0	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
10	VSEC	25BSE1204L	Computer Aided Engineering Drawing Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
11	VSEC	25BSE1205L	Design Thinking	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
12	CC	25BSE1206L	Community Services	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
			Total	**16**	**1**	**10**	**27**	**22**		**900**		
Total Contact Hours –27 Total Credits - 22												

***Student must complete two weeks internship after the semester, which will be evaluated on following semester.**

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Second Year B.Tech 2026-27 **SEMESTER – III**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	PCC	25ECE2301	Discrete Mathematical Structures	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ECE2302	Electronics Devices and Circuits	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PCC	25ECE2303	Digital Electronics & Microprocessor	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PCC	25ECE304	Data Structures	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	#MDM	25MMXXX2301	MDM I	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	*OE	25OE23XX	Open Elective-I	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	VEC	25VEC2002	Universal Human Values	1	--	--	1	1	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
8	PCC	25ECE2302L	Electronics Devices and Circuits Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
9	PCC	25ECE2303L	Digital Electronics & Microprocessor Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
10	PCC	25ECE2304L	Data Structures Laboratory using C++	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
11	#MDM	25MMXXX2301L	MDM I Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	

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12	Internship	25ECE2306L	Field Training/ Internship/ Industrial Training Evaluation					AU				
			Total	**17**		**8**	**25**	**21**		**950**		
Total Contact Hours – 25 Total Credits -21												

Open Electives I:

SR. NO.	COURSE CODE	COURSE NAME
1	25OE2301	Enhancing Soft Skill & Personality
2	25OE2302	Ethics in Engineering Practice
3	25OE2303	Introduction to Project Management

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Second Year B.Tech 2026-27 **SEMESTER – IV**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	PCC	25ECE2401	Analog and Digital Communication	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ECE2402	Microcontroller	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PCC	25ECE2403	Operating Systems	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PCC	25ECE2404	Object Oriented Programming and Computer Graphics	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	#MDM	25MMXXX2401	MDM II	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	*OE	25OE24XX	Open Elective- II	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	VEC	25VEC2001	Constitution of India	1	--	--	1	1	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
8	AEC	25AEC2001	Modern Language	1	--	--	1	1	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
9	PCC	25ECE2401L	Analog and Digital Communication Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
10	PCC	25ECE2402L	Microcontroller Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	--	--	
11	PCC	25ECE2404L	Object Oriented Programming &	--	--	2	2	1	CA1	25		40
									CA2	25		

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			Computer Graphics Laboratory						POE	50	20	
12	#MDM	25MMXXX2401L	MDM II Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
			Total	**18**		**8**	**26**	**22**		**1000**		
Total Contact Hours –26 Total Credits – 22												

***Student must complete two weeks internship after the semester, which will be evaluated on following semester.**

Open Elective Course II:

SR. NO.	COURSE CODE	COURSE NAME
1	25OE2401	Business Communication
2	25OE2402	E Business
3	25OE2402	Intellectual Property Rights

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Third Year B.Tech 2026-27 **SEMESTER – V**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	PCC	25ECE3501	Probability & Statistics	3	--	--	3	3	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
2	PCC	25ECE3502	Database Systems	3	--	--	3	3	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
3	PCC	25ECE3503	Computer Networks	3	--	--	3	3	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
4	PEC	25PEECE35XX	Program Elective I	3	--	--	3	3	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
5	#MDM	25MMXXX3501	MDM III	2	--	--	2	2	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
6	*OE	25OE35XX	Open Elective III	3	--	--	3	3	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
8	PCC	25ECE3502L	Database Systems Lab	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
9	VEC	25ECE3504L	Matlab Programming	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	--	--	
10	FP	25ECE3505L	Mini Project	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
11	#MDM	25MMXXX3501L	MDM III Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
12	Internship	25ECE3506L	Field Training/ Internship/ Industrial Training Evaluation	--	--	--	--	AU	--	--	--	--
			Total	**17**		**8**	**25**	**21**		**950**		
Total Contact Hours –25 **Total Credits – 21**												

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Program Elective Course I:

SR. NO.	COURSE CODE	COURSE NAME
1	25PEECE3501	Digital System & Design
2	25PEECE3502	Software Engineering
3	25PEECE3503	Signal Systems

Open Electives Course III:

SR. NO.	COURSE CODE	COURSE NAME
1	25OE3501	Employability and Skill Development
2	25OE3502	Business Fundamentals for Entrepreneurs
3	25OE3503	Patent Law for Engineers and Scientists

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Third Year B.Tech 2026-27 **SEMESTER – VI**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	PCC	25ECE3601	Theory of Competition	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ECE3602	Artificial Intelligence & Machine Learning	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PCC	25ECE3603	Internet of Things	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PCC	25ECE3603	Human Computer Interface	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	PEC	25PEECE36XX	Program Elective II	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	#MDM	25MMXXX3601	MDM IV	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	VSEC	25ECE3605L	Full Stack Development	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
8	PCC	25ECE3602L	Artificial Intelligence & Machine Learning Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
9	CEP	25ECE3606L	Project Phase I	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
10	#MDM	25MMXXX3601 L	MDM IV Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
			Total	**16**		**8**	**24**	**20**		**950**		
Total Contact Hours –25 Total Credits - 20												

***Student must complete two weeks internship after the semester, which will be evaluated on following semester.**

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Program Electives Course II:

Sr. No.	Course Code	Course Name
1	25PEECE3601	Embedded System
2	25PEECE3602	Distributed Systems
3	25PEECE3603	Digital Signal Processing

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B.Tech 2026-27 **SEMESTER – VII**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	PCC	25ECE4701	Cloud Computing	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ECE4702	Big Data Analytics	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PEC	25PEECE347XX	Program Elective III	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PEC	25PEECE447XX	Program Elective IV	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	PEC	25PEECE447XX	Program Elective V	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	#MDM	25MMXXX4701	MDM V	2	--	--	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	PCC	25ECE4701L	Cloud Computing Laboratory		--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
8	PEC	25PEECE47XXL	Program Elective IV Laboratory		--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
9	Project	25ECE4705L	Project Phase II		--	6	6	3	CA1	25		40
									CA2	25		
									OE	50	20	
10	Internship	25ECE4706L	Field Training/ Internship/ Industrial Training Evaluation		--	--	--	AU	--	--	--	--
			Total	**16**		**10**	**26**	**21**		**900**		

Total Contact Hours –26 **Total Credits – 21**

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Program Electives Course III:

Sr. No.	Course Code	Course Name
1	25PEECE4701	VLSI
2	25PEECE4702	Dev Ops
3	25PEECE4703	Digital Image Processing

Program Electives Course IV:

Sr. No.	Course Code	Course Name
1	25PEECE4704	Block Chain Technology
2	25PEECE4705	Mobile Application Development
3	25PEECE4706	Natural Language Processing

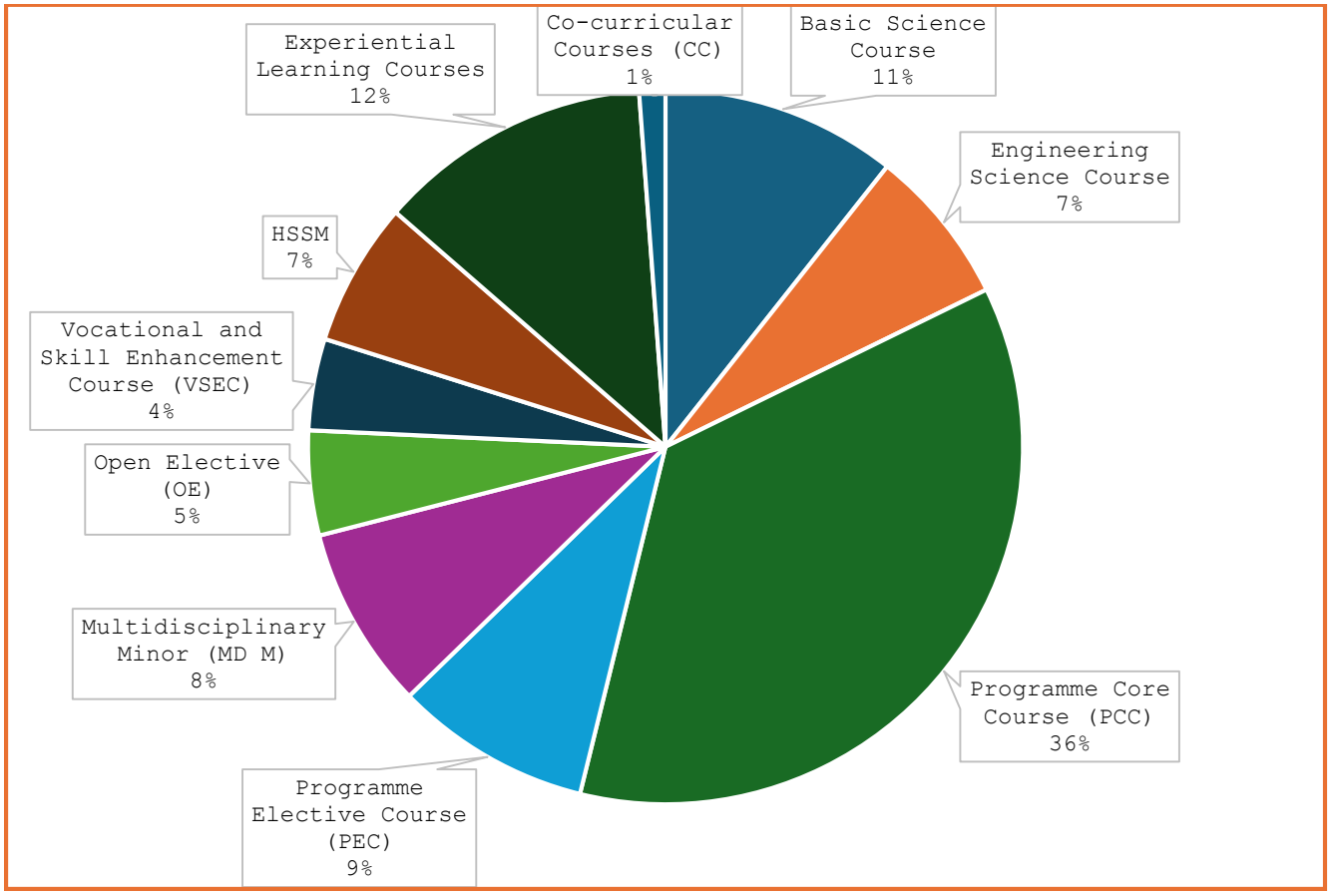
Program Electives Course V:

Sr. No.	Course Code	Course Name
1	25PEECE4707	Virtual Reality
2	25PEECE4708	Cryptography & Network Security
3	25PEECE4709	Deep Learning

B.Tech 2026-27 **SEMESTER – VIII**

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./ Week	Cr	Components	Max	Min for Passing	
1	HSSM	25HS4801	Finance Management	3			3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	ELC	25ELC4801	Research Methodology	4			4	4	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	ELC	25ECE4801	Industrial Internship/ Major Project/ Research Internship				30	12	CA	50		40
									OE	50	20	
			Total	**7**		**30**	**37**	**19**		**300**		
Total Contact Hours –37 Total Credits - 19												

G. Category wise Credit Distribution



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DEPARTMENT OF ELECTRONICS AND COMPUTER ENGINEERING

PCC: PROGRAM CORE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	25ECE2301	Discrete Mathematics	3			3	3
2	25ECE2302	Electronics Devices and Circuits	3			3	3
3	25ECE2303	Digital Electronics & Microprocessor	3			3	3
4	25ECE2304	Data Structures	3			3	3
5	25ECE2302L	Electronics Devices and Circuits Lab			2	2	1
6	25ECE2303L	Digital Electronics & Microprocessor Lab			2	2	1
7	25ECE2304L	Data Structures Lab			2	2	1
8	25ECE2401	Analog and Digital Communication	3			3	3
9	25ECE2402	Microcontroller	2			2	2
10	25ECE2403	Operating Systems	3			3	3
11	25ECE2404	Object Oriented Programming & Computer Graphics	3			3	3
12	25ECE2401L	Analog and Digital Communication Lab			2	2	1
13	25ECE2402L	Microcontroller Lab			2	2	1
14	25ECE2404L	Object Oriented Programming & Computer Graphics Lab			2	2	1
15	25ECE3501	Probability & Statistics	3			3	3
16	25ECE3502	Database Systems	3			3	3
17	25ECE3503	Computer Network	3			3	3
18	25ECE3502L	Database Systems Lab			2	2	1
19	25ECE3601	Theory of Computation	3			3	3
20	25ECE3602	Artificial Intelligence & Machine Learning	3			3	3
21	25ECE3603	Internet of Things	3			3	3
22	25ECE3604	Human Computer Interface	2			2	2
23	25ECE3602L	Artificial Intelligence & Machine Learning Lab			2	2	1

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24	25ECE4701	Cloud Computing	3			3	3
25	25ECE4703	Big Data Analytics	3			3	3
26	25ECE4701L	Cloud Computing Lab			2	2	1
Total			**50**	**--**	**18**	**68**	**59**

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PEC: PROGRAM ELECTIVE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25PEECE3501	Digital Systems & Design	3	-	-	3	3
2.	25PEECE3502	Software Engineering					
3.	25PEECE3503	Signal Systems					
4..	25PEECE3601	Embedded Systems	3	-	-	3	3
5.	25PEECE3602	Distributed Systems					
6.	25PEECE3603	Digital Signal Processing					
8.	25PEECE4701	VLSI	3	-		3	3
9.	25PEECE4702	Dev Ops					
10.	25PEECE4703	Digital Image Processing					
11.	25PEECE4704	Block Chain Technology	3			3	3
12.	25PEECE4705	Mobile Application Development					
13.	25PEECE4706	Natural Language Processing					
14.	25PEECE4704L	Block Chain Technology		-	2	2	1
15.	25PEECE4705L	Mobile Application Development					
16.	25PEECE4706L	Natural Language Processing					
17.	25PEECE4707	Virtual Reality	3			3	3
18.	25PEECE4708	Cryptography & Network Security					
19.	25PEECE4709	Deep Learning					
Total			**12**	**--**	**2**	**17**	**16**

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OEC: OPEN ELECTIVE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25OE2301	Enhancing Soft Skill & Personality	2	--	--	2	2
2.	25OE2302	Ethics in Engineering Practice					
3	25OE2303	Introduction to Project management					
4.	25OE2401	Business Communication	3	--	--	3	3
5.	25OE2402	E- Business					
6.	25OE2403	Intellectual Property Rights					
7.	25OE3501	Employability Skill Development	3	--	--	3	3
8.	25OE3502	Business Fundamentals for Entrepreneurs					
9.	25OE3503	Patent Law for Engineers and Scientists					
Total			**8**	**--**	**--**	**8**	**8**

VSEC:VOCATIONAL AND SKILL ENHANCEMENT COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25BSE1105L	Engineering Practice Laboratory	--	--	2	2	1
2.	25BSE1204	Computer Aided Engineering Drawing	2	--	--	2	2
3.	25BSE1204L	Computer Aided Engineering Drawing Laboratory			2	2	1
4.	25BSE1205L	Design Thinking			2	2	1
5.	25ECE3506L	Matlab Programming			2	2	1
6.	25ECE3606L	Full Stack Development			2	2	1
Total			**2**	**--**	**10**	**12**	**7**

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HUMANITIES SOCIAL SCIENCE AND MANAGEMENT COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25BSE1104	Communication Skills	2	--	--	2	2
2.	25BSE1104L	Communication Skills Laboratory	--	--	2	2	1
3	25BSE1205	Energy, Ecology & Environment	2	--	--	2	2
4.	25VEC2001	Constitution of India	1	--	--	1	1
5.	25VEC2001	Universal Human Values	1	--	--	1	1
6.	25AEC2401	Modern Language	1	--	--	1	1
7.	25HS4801	Finance Management	3	--	--	3	3
Total			**10**	**--**	**2**	**12**	**11**

EXPERIENTIAL LEARNING

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1	25ECE3505L	Mini Project	--	--	2	2	1
2	25ECE3606L	Project Phase I	--	--	2	2	1
3	25ECE4705L	Project Phase II	--	--	6	6	3
4	25ELC4801	Research Methodology	4	--	--	4	4
5	25ECE4801	Industrial Internship / Major Project/ Research Internship	--	--	--	30	12
Total			**4**	**--**	**40**	**44**	**21**

H.Multi-Disciplinary Minor Course

Multi-Disciplinary Minor: MDM Courses to be offered by ECE(Minor in Full Stack Development)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMECE2301	Introduction to web Development	2	--	2	4	3

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2.	25MMECE2401	Front End development React JS	2	--	2	4	2
3.	25MMECE3501	Backend Development with Node Js & express JS	2	--	2	4	3
4.	25MMECE3601	Database Management with MongoDB	2	--	2	4	3
5.	25MMECE4701	Cloud Deployment for MERN Application	2	--	2	2	2
Total			**10**	**--**	**18**	**14**	**14**

Multi-Disciplinary Minor For ECE Department Students(Minor in Mechatronics)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMMEC23XX	Introduction of Mechatronics	3	--	--	3	3
2.	25MMMEC24XX	Design of Mechatronics	2	--	--	2	2
3.	25MMMEC35XX	Sensor technology	3	--	--	3	3
4.	25MMMEC36XX	Mechatronics in Automotive System	3	--	--	3	3
5.	25MMMEC47XX	Industrial Automation	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

Multi-Disciplinary Minor For ECE Department Students(Minor in Electric Vehicle Technology)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMEEE2301	Fundamental of Electric Vehicles	3	--	--	3	3
2.	25MMEEE2401	Embedded System for EV	2	--	--	2	2
3.	25MMEEE3501	AI & IOT in Electric Vehicles	3	--	--	3	3
4.	25MMEEE3601	Autonomous & EV Technology	3	--	--	3	3
5.	25MMEEE4701	Emerging Trends in EV	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

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I. Exit courses

EXIT COURSE AFTER FIRST YEAR: ONE YEAR UG CERTIFICATION IN ELECTRONICS & COMPUTER ENGINEERING

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hr./W	Cr	Components	Max	Min for Passing	
1	VSEC	25ECEEX101	Certification Course in Digital Electronics	--	--	6	6	3	CA1	25		40
									CA2	25		
									POE	50	20	
2	VSEC	25ECEEX102	Certification Course in Python for Data Science	--	--	4	4	2	CA1	25		40
									CA2	25		
									POE	50	20	
3	VSEC	25ECEEX103	Certification Course in Object Oriented Programming	--	--	6	6	3	CA1	25		40
									CA2	25		
									POE	50	20	
Total				--	--	16	16	8		300		

EXIT COURSE AFTER SECOND YEAR: TWO YEAR UG DIPLOMA IN ELECTRONICS & COMPUTER ENGINEERING

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./W	Cr	Components	Max	Min for Passing	
1	VSEC	25ECEEX201	Certification Course in Database Systems	--	--	6	6	3	CA1	25		40
									CA2	25		
									POE	50	20	
2	VSEC	25ECEEX202	Certification Course in Computer Networks	--	--	4	4	2	CA1	25		40
									CA2	25		
									POE	50	20	
3	VSEC	25ECEEX203	Certification Course in Embedded Systems	--	--	6	6	3	CA1	25		40
									CA2	25		
									POE	50	20	
Total				--	--	16	16	8		300		

EXIT COURSE AFTER THIRD YEAR: THIRD YEAR BACHELOR'S DEGREE IN VOCATION (B.VOC) IN ELECTRONICS & COMPUTER ENGINEERING

Sr. No.	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs./W	Cr	Components	Max	Min for Passing	
1	VSEC	25ECEEX301	Certification Course in Cloud Computing	--	--	6	6	3	CA1	25	--	40
									CA2	25		
									POE	50	20	
2	VSEC	25ECEEX302	Certification Course in Mobile	--	--	4	4	2	CA1	25	--	40
									CA2	25		

			Application Development						OE	50	20	
3	VSEC	25ECEEX303	Certification Course in VLSI	--	--	6	6	3	CA1	25	--	40
									CA2	25		
									POE	50	20	
Total				**--**	**--**	**16**	**16**	**8**		**300**		

J. Emerging/Minor Degree : Data Vision

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ECEEM001	Fundamentals of Data Vision	3	--	--	3	3
2.	25ECEEM002	Data Analytics and Pattern Recognition	3	--	--	3	3
3	25ECEEM003	Visual Computing and Image Understanding	3	--	--	3	3
4.	25ECEEM004	Intelligent Data Visualization	3	--	--	3	3
5	25ECEEM005	Deep Learning for Data Vision	3	--	--	3	3
6	25ECEEM006	Human-Centered Visual Intelligence	3			3	3
Total			**18**	**--**	**--**	**18**	**18**

K. Honors Degree: Cloud Computing

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ECEHS001	Foundations of Cloud Computing	3	--	--	3	3
2.	25ECEHS002	Cloud Infrastructure and Virtualization	3	--	--	3	3
3.	25ECEHS003	Cloud Application Development and DevOps	3	--	--	3	3
4.	25ECEHS004	Amazon Web Services (AWS) and Cloud Deployment	3	--	--	3	3
5.	25ECEHS005	Advanced Cloud Computing Technologies	3	--	--	3	3
6.	25ECEH006	Cloud Security and Governance	3			3	3
Total			**18**	**--**	**--**	**18**	**18**

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SEM III

Title of the Course: Discrete Mathematical Structures	**L**	**T**	**P**	**Credit**
Course Code: 25ECE2301	**3**	**--**	**-**	**3**

Course Pre-Requisite: Basic knowledge of mathematics and logical reasoning skills.

Course Description: This Course covers basic discrete mathematical concepts and develops logical and problem - solving skills for computer science applications.

Course Objectives: By the end of this course, the students will be able to:

- To develop logical and analytical thinking required for solving computational problems.
- To introduce fundamental concepts of discrete structures such as sets, relations and functions.
- To enable students to apply counting techniques and combinatorial methods in problem solving.
- To provide knowledge of graph theory and trees for applications in computer science and data structures.
- To familiarize students with algebraic structures and Boolean algebra used in digital systems.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Apply concepts of sets and propositional logic to solve problems
CO2	Use functions and relations for problem modeling
CO3	Solve problems using counting techniques and recurrence relations
CO4	Apply graph theory and tree concepts in computational problems
CO5	Understand algebraic structures and Boolean algebra concepts

CO-PO Mapping:

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

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/ Seminar / Group discussions presentation, etc.

MSE is based on 50% of course content.

ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents:

Unit No.	Unit Title and Contents	Hours
1.	**Fundamental Structures and Logic** Sets, Venn diagrams, Cartesian product, proportional logic, Logical connectives, Truth tables, Normal forms, Predicate logic (basic concepts only)	09
2.	**Functions and Relations** Injective, Subjective, Bijective functions, Composition, Relations, Equivalence relations	08
3.	**Combinatorics:** Basic counting techniques (Permutations, Combinations), Simple recurrence relations	07
4	**Graph Theory and Trees:** Basic graph terminology, Paths, Circuits, Euler path, Graph representation, **Trees:** Basic Concepts, Binary trees, Spanning trees.	09
5	**Algebraic Systems:** Groups (basic definition and examples), Semigroups, Monoids, Boolean algebra	07

Textbooks:

Sr.No	Title	Author	Publisher
1.	Elements of Discrete Mathematics	C.L. Liu	McGraw-Hill Publication
2.	Discrete Mathematics and its Applications	Kenneth H. Rosen	McGraw-Hill Publication

3.	Discrete Mathematical Structures	Y. N. Singh	Wiley Publication
4.	Graph Theory with Applications	Dr. Sukhendu Dey	SPD Publication

Reference Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Discrete mathematics	Lipschutz Lipson	McGraw- Hill
2.	Schaum's Outline of Graph Theory	V. K. Balakrishnan	McGraw- Hill
3.	Discrete mathematics with Proof	Eric Gossett	Wiley Publication

Title of the Course: Electronics Devices and Circuits **Course Code: 25ECE2302**	**L**	**T**	**P**	**Credit**
	3	**--**	**--**	**3**

Course Pre-Requisite: Basic Mathematics, Semiconductor Physics, Basic Electrical Engineering

Course Description:
This course introduces fundamental analog electronic devices and circuits including diodes, BJTs, FETs, amplifiers, oscillators, and power supplies. It emphasizes **analysis, design, and practical understanding** of analog systems used in real-world electronic applications.

Course Objectives:
1. Study semiconductor devices like JFET & MOSFET
2. Understand DC & AC analysis of MOSFET
3. Learn MOSFET circuits and applications
4. Understand feedback amplifiers & oscillators
.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Explain the operation and characteristics of BJT and MOSFET devices.
CO2	Analyze and design BJT and MOSFET biasing and amplifier circuits.
CO3	Understand the architecture and performance parameters of Operational Amplifiers.
CO4	Design and analyze linear Op-Amp circuits for signal conditioning.
CO5	Design and implement non-linear Op-Amp applications for practical engineering systems.

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011	PSO1	PSO2
CO1	3	2			1						1		
CO2	3	3	2	1	2						1	2	
CO3	3	2			1						1		
CO4	3	3	3	2	2						1	3	2
CO5	3	3	3	2	3						1	3	2

Assessment Scheme:
Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/Seminar/Group discussions presentation, etc.

MSE is based on 50% of course content.

ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Bipolar Junction Transistor:** Need for biasing BJT, Transistor biasing methods, Transistor as amplifier , RC coupled Amplifiers, Frequency response of CE amplifier, Emitter follower, Cascaded Amplifier, Need for multistage amplifiers and suitability of CE, CC and CB configurations in multistage amplifiers.	8
2.	**MOSFET:** Construction and Working of MOSFET, Enhancement and Depletion MOSFET , V-I Characteristics, MOSFET as a Switch, Common Source Amplifier, Frequency Response, Comparison of BJT and MOSFET	8
3.	**Basics of Operational Amplifier:** Differential Amplifier Concept, Block Diagram of Op-Amp, Ideal and Practical Characteristics, Op-Amp Parameters, Feedback topologies, Concept of virtual short	8
4	**Linear Applications of Op-Amp**: Inverting Amplifier, Non-Inverting Amplifier, Voltage Follower, Summing Amplifier, Difference Amplifier, Instrumentation Amplifier, Integrator, Differentiator, Active Filters :Low Pass Filter & High Pass Filter	8
5	**Non-Linear Applications of Op-Amp:** Comparator, Zero Crossing Detector, Schmitt Trigger, Precision Rectifier, Peak Detector, Clipper and Clamper, Sample and Hold Circuit, Astable and Monostable Multivibrator, Waveform Generators	8

Text Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Electronic Devices and circuits	S.Salivahanan,NSureshKumar, AVallavaraj	TMH Publication

2.	Microelectronic Circuits	A.S.SedraandK.C.Smith	Saunder CollegePublishing, 1991.
3.	Electronic Devices and Circuits	David A. Bell	Oxford University Press, 2008.
4.	Electronic Devices and Circuit Theory	Boylestad,	Pearson Publication.

Reference Books:

Sr.No	Title	Author	Publisher
1.	Electronic Devices and Circuits	A.P. Godse and U.A. Bakshi	scitech Publication.
2.	Electronic Devices and Circuits	Allen Mottershead	PHI 3
3.	Electronic Devices and Circuits	J.B.Gupta	Katson Publication

Title of the Course: Digital electronics and microprocessor **Course Code:** 25ECE2303	**L**	**T**	**P**	**Credit**
	3	**--**	**-**	**3**

Course Pre-Requisite: Basic knowledge of numbering system and logic gates.

Course Description: This course introduces the fundamentals of digital electronics and 8085 microprocessor systems. It covers combinational and sequential logic design using Boolean algebra, K-maps, logic gates, flip-flops, counters and registers. The course also explains 8085 architecture, addressing modes and assembly language programming. In addition, it includes interfacing of memory and peripheral devices such as 8255, ADC, DAC, seven segment displays and stepper motors for basic digital and embedded system applications.

Course Objectives:

1**.** Understand the fundamentals of digital electronics and apply Boolean algebra and K-map techniques for simplification and design of combinational logic circuits.

2. Analyze and design sequential logic circuits using flip-flops, registers, shift registers and counters.

3. Understand the architecture, organization and addressing modes of the 8085 microprocessor.

4. Develop assembly language programs using 8085 instruction set for arithmetic, logical, branching and control operations..

5. Interface memory and peripheral devices such as 8255, 8279, ADC, DAC, stepper motor and display systems with 8085 microprocessor.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Simplify and design combinational logic circuits using Boolean algebra, K-maps and standard logic gates.
CO2	Analyze and design sequential circuits using flip-flops, registers and counters.
CO3	Explain architecture, organization and addressing modes of 8085 microprocessor.
CO4	Develop assembly language programs using 8085 instruction set for arithmetic, logical and control applications.
CO5	Interface peripheral devices with 8085 microprocessor for real-time applications.

CO-PO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**	**PSO1**	**PSO2**
CO1	3	3	3	1	2							2	
CO2	3	3	3	2	2							2	
CO3	3	2	1		1							2	
CO4	3	3	2	2	2					1		2	
CO5	3	3	3	2	3	1			1	1		2	

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester

Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/Seminar/Group discussions presentation, etc.
MSE is based on 50% of course content.
ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	Combinational Logic Design Standard representations for logic functions, k map representation of logic functions (SOP and POS forms), minimization of logical functions for min-terms and max-terms (upto 4 variables), don‟t care conditions, Design Examples: Adders and their use as subtractor , look ahead carry, Code converters., Digital Comparator, Parity generators/checkers, Multiplexers and Demultiplexers, BCD - to – 7 segment decoder	8
2.	Sequential Logic Design 1 Bit Memory Cell, Clocked SR, JK, MS J-K flip flop, D and T flip-flops. Use of preset and clear terminals, Excitation Table for flip flops and Conversion of flip flops. Application of Flip-flops: Registers, Shift registers, Counters (ring counters, twisted ring counters), ripple counters, up/down counters, synchronous counters	8
3.	Introduction to 8085 Microprocessor based System: Architecture, Pin Description. Addressing modes.	6
4	Introduction to 8085 Assembly language programming & Instruction set, Programming examples using Data Transfer, Arithmetic, Logical, Branching and control instructions. Stacks and subroutine related programs, Timing diagram, Serial data transfer. Interrupts.	8
5	External memory interfacing, Interfacing of 8255, 8279, Interfacing of 7 Segment display, ADC, DAC.	8

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Digital Circuits	Anand Kumar	PHI

2.	Microprocessor-Architecture, programming and application with 8085	gaonkar	penram international.
3.	The 8085 microcontroller & embedded system, using assembly and C	M. A. Mazidi	2nd edi, pearsonedu

Reference Books			
1.	Modern digital electronics‖	R.P. Jain	3rd edition, 12threprint Tata McGraw Hill Publication,2007
2.	An Engineering Approach to Digital Design	WilliamI .Fletcher	PHI/Pearson
3.	Microprocessors & Interfacing	Douglas V. Hall	McGraw Hill International Edition, 1992

Title of the Course: Data Structures **Course Code:** 25ECE2304	**L**	**T**	**P**	**Credit**
	3	**--**	**--**	**3**

Course Pre-Requisite: A student should know basic programming (such as C programming language or Python), fundamental mathematics, and problem-solving skills before studying Data Structures.

Course Objectives:

1. To understand fundamental concepts and implementation of core data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
2. To develop the ability to analyze and evaluate algorithm efficiency using time and space complexity.
3. To design and implement efficient algorithms using appropriate data structures for real-world problems.
4. To apply problem-solving techniques and logical thinking in optimizing computational solutions.
5. To understand memory management and data organization for efficient data storage and retrieval.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Students will be able to implement and use various data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
CO2	Students will be able to analyze algorithms using time and space complexity techniques.
CO3	Students will be able to select appropriate data structures for solving specific computational problems.
CO4	Students will be able to design efficient algorithms and apply problem-solving strategies to real-world scenarios.
CO5	Students will be able to demonstrate understanding of memory utilization and optimize data storage and retrieval mechanisms.

CO-PO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**	**PSO1**	**PSO2**
CO1	3	2	1	-	2	-	-	-	1	-	1	2	-
CO2	3	3	2	2	1	-	-	-	-	-	2	2	-
CO3	3	3	3	2	2	-	-	-	1	-	2	3	-
CO4	3	3	3	3	2	-	-	-	1	-	2	3	-
CO5	3	2	2	2	2	-	-	-	-	-	2	2	-

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/Seminar/Group discussions presentation, etc.

MSE is based on 50% of course content.

ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Fundamentals & Complexity** Introduction to Data Structures & ADT, Algorithm design principles, Time & Space Complexity (Big-O, Big-Theta, Big-Omega), Recursion and applications, Arrays and Strings, Memory representation.	08
2.	**Linear Data Structures** Arrays: operations and applications, Linked Lists: singly, doubly, circular, Stack: implementation & applications (expression evaluation, recursion), Queue: simple, circular, priority queue, deque, Applications of linear structure.	10
3.	**Non-Linear Data Structures (Trees)** Tree terminology and representation, Binary Trees and traversals, Binary Search Trees (BST), AVL Trees (balancing techniques), Heaps and Priority Queues, Applications of trees.	8
4.	**Graphs** Graph representation (Adjacency Matrix & List), Traversals: BFS, DFS, Shortest Path Algorithms (Dijkstra's), Minimum Spanning Trees (Prim's, Kruskal's), Applications of Graphs.	8
5.	**Searching, Sorting & Hashing** Searching: Linear and Binary Search, Sorting: Bubble, Selection, Insertion, Merge, Quick, Heap Sort, Hashing: hash functions, collision resolution (chaining, probing), Introduction to file structures, Performance comparison of Algorithms.	8

Text Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Data Structures and Algorithms Made Easy	Narasimha Karumanchi	CareerMonk Publications
2.	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	MIT Press
3.	Data Structures and Algorithm Analysis in C++	Mark Allen Weiss	Pearson
4.	Data Structures.	P. Sudarshan, J John Manoj Kumar	CBS Publishers & Distributors

Reference Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	The Algorithm Design Manual	Steven S. Skiena	Springer
2.	Advanced Data Structures	Peter Brass	Cambridge University Press

Title of the Course: Open Elective-I Enhancing Soft Skills and Personality **Course Code: 25OE2301**	**L**	**T**	**P**	**Credit**
	2	**-**	**-**	**2**

Course Pre-Requisite:

- Basic communication skills in English.
- Willingness to participate in individual and group activities.
- Interest in personal and professional development.
- Basic awareness of workplace and social interactions.
- Positive attitude toward self-improvement and lifelong learning.

Course Description:

Enhancing Soft Skills and Personality is designed to develop the personal, interpersonal, and professional competencies required for academic success and career growth. The course focuses on self-awareness, personality development, communication skills, emotional intelligence, leadership, teamwork, professional etiquette, employability skills, and lifelong learning. Students learn to improve their communication abilities, strengthen interpersonal relationships, build confidence, and develop professional behavior required in modern organizations.

Course Objectives:

1. Develop self-awareness and personality development skills.
2. Enhance verbal, non-verbal, written, and interpersonal communication skills.
3. Strengthen leadership, teamwork, and conflict management abilities.
4. Build emotional intelligence and professional workplace behavior.
5. Prepare students for career opportunities and lifelong learning.

Course Outcomes:

CO	After the completion of the course, the students should be able to
CO1	Analyze personal strengths, weaknesses, emotions, and personality traits for self-development.
CO2	Demonstrate effective verbal, non-verbal, written, and interpersonal communication skills.
CO3	Apply leadership, teamwork, negotiation, and conflict resolution skills in professional settings.
CO4	Exhibit professional etiquette, emotional intelligence, and workplace behavior.
CO5	Develop career planning, employability, interview, and lifelong learning skills.

CO-PO Mapping:

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

Assessment Scheme:
Two components of Continuous Assessment (CA1 & CA2), one Mid Semester Examination (MSE) and one End Semester Examination (ESE), have 30%, 20% and 50% weightage, respectively.

Assessment Component	Marks
CA1	10
MSE	30
CA2	10
ESE	50

CA1 and CA**2** are based on the Assignment/ Surprise test/ Quiz/ Seminar/ Group discussions / presentation, etc.
MSE is based on 50% of course content.
ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1	**Self-Awareness and Personality Development –** Self-concept, Self-esteem, SWOT Analysis, Personality Traits, Goal Setting, Positive Attitude, Confidence Building, Time Management, Personal Effectiveness	**07**
2	**Emotional Intelligence and Communication Skills –** Self-Awareness, Verbal Communication, Non-Verbal Communication, Listening Skills, Speaking Skills, Reading Skills, Writing Skills, Interpersonal Communication, Workplace Communication ,Self-Regulation, Motivation, Empathy, Social Skills, Relationship Management, Conflict Resolution, Negotiation Skills	**08**
3	**Leadership and Team Building –** Leadership Styles, Team Dynamics, Team Building, Collaboration, Decision Making, Problem Solving, Workplace Ethics, Professional Etiquette	**07**
4	**Career Development and Employability Skills –** Resume Writing, Cover Letter Preparation, Group Discussions, Interview Skills, Personal Branding, Professional Networking, Career Planning, Lifelong Learning	**07**

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1	Personality Development and Soft Skills	Barun K. Mitra	Oxford University Press
2	Soft Skills: Know Yourself and Know the World	Dr. Alex K.World	S. Chand Publications

Reference Books			
Sr.No	**Title**	**Author**	**Publisher**
1	Developing Communication Skills	Krishna Mohan & Meera Banerji	Macmillan
2	Communication Skills for Engineers and Scientists	Sangeeta Sharma & Binod Mishra	PHI Learning
3	Seven Habits of Highly Effective People	Stephen R. Covey	Simon & Schuster

Title of the Course: Open Elective-I Ethics In Engineering Practices Course **Code: 25OE2302**	**L**	**T**	**P**	**Credit**
	2	**-**	**-**	**2**

Course Pre-Requisite:

- Basic communication and comprehension skills.
- Awareness of social and professional responsibilities.
- Fundamental understanding of engineering disciplines.
- Interest in ethical, environmental, and societal issues.
- Ability to analyze situations and make reasoned judgments.

Course Description:

Ethics in Engineering Practices is designed to develop ethical awareness, professional responsibility, and decision-making skills among engineering students. The course examines moral values, professional ethics, accountability, integrity, sustainability, environmental responsibility, and the societal impact of engineering decisions. Students learn to identify ethical dilemmas, evaluate professional responsibilities, apply ethical principles, and contribute to sustainable and socially responsible engineering solutions. The course emphasizes ethical leadership, workplace professionalism, and responsible use of emerging technologies.

Course Objectives:

1. To develop ethical awareness and professional responsibility among engineering students.
2. To understand the impact of engineering decisions on society and the environment.
3. To cultivate ethical decision-making skills in professional practice.
4. To promote sustainable and socially responsible engineering solutions.

Course Outcomes:

CO	After the completion of the course, the students should be able to
CO1	Explain ethical principles, moral values, and professional responsibilities.
CO2	Analyze ethical dilemmas and make responsible engineering decisions.
CO3	Evaluate societal, environmental, and sustainability concerns in engineering practices.
CO4	Deliver effective presentations and negotiate professionally.
CO5	Apply professional ethics, integrity, accountability, and legal responsibilities.

CO-PO Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	P011
CO1							3	3	3		1
CO2		3					3				
CO3						3	3				
CO4			3					3	3		2
CO5							3	3	3		

Assessment Scheme:
Two components of Continuous Assessment (CA1 & CA2), one Mid Semester Examination (MSE) and one End Semester Examination (ESE), have 30%, 20% and 50% weightage, respectively.

Assessment Component	Marks
CA1	10
MSE	30
CA2	10
ESE	50

CA1 and CA**2** are based on the Assignment/ Surprise test/ Quiz/Seminar/Group discussions/ presentation, etc.
MSE is based on 50% of course content.
ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1	**Foundations of Engineering Ethics-** Meaning and Importance of Ethics, Engineering as a Profession, Moral Values and Ethical Principles, Rights Duties and Responsibilities, Ethical Dilemmas in Engineering, Engineering Case Studies	**07**
2	**Professional Responsibility-** Professional Codes of Ethics, Accountability and Integrity, Confidentiality and Intellectual Property Rights, Whistleblowing, Ethical Leadership, Workplace Professionalism	**07**
3	**Technology, Society and Sustainability-** Engineers and Society, Sustainable Development Goals (SDGs), Environmental Ethics, Green Engineering, Corporate Social Responsibility (CSR), Ethical Use of Emerging Technologies	**07**
4	**Ethical Decision Making and Leadership -** Ethical Decision Models, Value-Based Leadership, Organizational Ethics, Governance and Compliance, Stakeholder Management, Ethical Risk Assessment	**07**

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1	Ethics in Engineering	Mike W. Martin & Roland Schinzinger	McGraw-Hill Education
2	Engineering Ethics	Charles E. Harris Jr., Michael Pritchard & Michael Rabins	Cengage Learning

Reference Books			
Sr.No	**Title**	**Author**	**Publisher**
1	Engineering Ethics: Concepts and Cases	Charles E. Harris Jr.	Cengage Learning
2	Ethics, Technology and Engineering	Ibo van de Poel & Lambèr Royakkers	Wiley-Blackwell
3	Practical Ethics for Engineers	John R. Boatright	CRC Press
4	Professional Ethics and Human Values	R. S. Naagarazan	New Age International

Title of the Course: Open Elective-I Introduction to Project Management **Code: 25OE2303**	**L**	**T**	**P**	**Credit**
	2	**-**	**-**	**2**

Course Pre-Requisite:

- Basic understanding of engineering and technology concepts.
- Fundamental communication and teamwork skills.
- Logical thinking and problem-solving ability.
- Awareness of organizational and business environments.

Course Description:

This course introduces students to the fundamentals of project management, including project planning, scheduling, execution, monitoring, and closure. It covers the project life cycle, stakeholder management, risk management, quality management, and the use of common project management tools and techniques. The course aims to develop the ability to plan and manage projects effectively in engineering and business environments.

Course Objectives:

1) To understand the fundamental concepts and importance of project management.
2) To explain the phases of the project life cycle and project planning techniques.
3) To introduce scheduling, budgeting, risk, and quality management practices.
4) To develop skills in project execution, monitoring, and successful project closure.

Course Outcomes:

CO	After completion of the course, the students should be able to
CO1	Explain the principles, objectives, and life cycle of project management.
CO2	Prepare project plans, schedules, and resource allocation strategies.
CO3	Identify and manage project risks, costs, quality, and stakeholder expectations.
CO4	Apply monitoring, control, and project closure techniques to improve project success.

CO-PO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**
CO1	3	2	1	1	1	-	-	-	1	2	2
CO2	3	3	2	2	2	-	-	-	2	2	2
CO3	2	3	3	2	2	1	1	-	2	2	2
CO4	2	2	3	3	2	1	-	1	3	3	2

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/Seminar/Group discussions presentation, etc.

MSE is based on 50% of course content.

ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents:

Unit No.	Unit Title and Contents	Hours
1.	**Introduction** Concept and characteristics of projects, Project management fundamentals, Importance and objectives of project management, Project life cycle, Roles and responsibilities of project manager ,Stakeholders and organizational structures, Project selection and feasibility analysis	07
2.	**Project Planning and Scheduling** Project scope definition**,** Work Breakdown Structure (WBS)**,** Project planning process**,** Resource planning and allocation, Scheduling techniques**,** Gantt Charts**,** Critical Path Method (CPM)**,** Introduction to PERT	07
3.	**Project Cost, Risk, and Quality Management** Cost estimation and budgeting, Project financing basics, Risk identification and risk assessment, Risk mitigation strategies, Quality planning and quality assurance, Performance measurement and documentation, Communication management	08
4.	**Project Execution, Monitoring, and Closure** Project execution and coordination, Team management and leadership, Project monitoring and control, Change management, Performance evaluation, Project documentation and reporting, Project closure and lessons learned, Introduction to project management software tools	08

Text Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Project Management: The Managerial Process	Clifford F. Gray, Erik W. Larson	McGraw-Hill Education

Reference Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Project Management: A Systems Approach to Planning, Scheduling, and Controlling	Harold Kerzner	John Wiley & Sons
2.	Information Technology Project Management	Kathy Schwalbe	Cengage Learning
3.	A Guide to the Project Management Body of Knowledge (PMBOK® Guide)	Project Management Institute (PMI)	Project Management Institute (PMI)

Title of the Course:MDM-I(Introduction to Web Development) **Course Code:** 25MMECE2301	**L**	**T**	**P**	**Credit**
	2	**--**	**--**	**2**

Course Pre-Requisite: Basic knowledge of computers, internet usage, and file management is required. Familiarity with text editors such as Visual Studio Code and basic programming concepts is recommended.

Course Description: This course introduces the fundamentals of web development using HTML5, CSS3, and responsive design principles. Students will learn to create structured webpages, apply styling techniques, and develop user-friendly web interfaces. The course also covers modern layout methods, responsive web design, and frontend frameworks such as Bootstrap. By the end of the course, students will be able to design and develop responsive static websites independently.

Course Objectives:

- To understand the fundamentals of web development and design structured web pages using HTML5 elements and semantic tags.
- To apply CSS techniques for styling, layout management, and responsive web page design.
- To develop JavaScript programs using control structures, functions, arrays, objects, and modern scripting features.
- To build interactive and dynamic web applications using DOM manipulation, event handling, form validation, and asynchronous JavaScript.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Understand the concepts of HTML5 and apply HTML elements, forms, tables, multimedia, and semantic tags in web page development.
CO2	Understand CSS concepts and apply styling, layout design, box model, Flexbox, Grid, and responsive design techniques for web pages.
CO3	Develop JavaScript programs using variables, operators, control structures, functions, arrays, objects, and ES6 features.
CO4	Build interactive web applications using DOM manipulation, event handling, form validation, asynchronous JavaScript, and Fetch API integration.

CO-PO Mapping:

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

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), Mid Semester Examination (MSE) and End Semester Examination (ESE) having 30%, 20% and 50% weightage respectively.

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and **CA2** are based on Assignment/ Declared test/ Quiz/Seminar/Group discussions presentation, etc.

MSE is based on 50% of course content.

ESE is based on 100% course content with 60-70% weightage for course content covered after MSE

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Fundamentals of Web Development and HTML5:** Introduction to Web Development and Client-Server Architecture, Structure of HTML5 Document and Basic Tags, Text Formatting, Headings, Lists, and Hyperlinks, Images, Audio, Video, and Iframes, Tables and Table Formatting, Forms and Form Controls, Semantic HTML Elements.	7
2.	**Cascading Style Sheets (CSS):** Introduction to CSS and Types of CSS, CSS Selectors, Properties, and Values, Colors, Backgrounds, Borders, Margins, and Padding, CSS Box Model and Display Properties, Styling Text, Fonts, and Links, Flexbox Layout and CSS Grid, Media Queries and Responsive Web Design.	7
3.	**JavaScript Fundamentals:** Introduction to JavaScript and Client-Side Scripting, Variables, Data Types, Operators, and Expressions, Input/Output Statements and Dialog Boxes, Conditional Statements and Looping Structures, Functions and Scope, Arrays, Strings, and Built-in Methods, Objects and ES6 Features .	7
4	**Advanced JavaScript and Web Interactivity:** Document Object Model (DOM) Manipulation, Event Handling and Event Types, Form Validation using JavaScript, Dynamic Creation and Modification of HTML Elements, Timing Functions and Browser Events, Introduction to Asynchronous JavaScript and Callbacks, Basics of Fetch API and Working with JSON Data.	7

Text Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	HTML and CSS: Design and Build Websites	Jon Duckett	Wiley Publications.
2.	Learning Web Design	Jennifer Niederst Robbins	O'Reilly Media
3.	Beginning HTML, XHTML, CSS, and JavaScript.	Jon Duckett	Wiley India.

Reference Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Responsive Web Design with HTML5 and CSS	Ben Frain	Packt Publishing
2.	Web Design with HTML, CSS, JavaScript and jQuery Set	Jon Duckett	Wiley Publications
3.	Bootstrap 5 Essentials	Sachin Pant	BPB Publications

Title of the Course: Universal Human Values	**L**	**T**	**P**	**Credit**
Course Code: 25VEC2002	**1**	**--**	**--**	**1**

Course Pre-Requisite: Students are not required to have prior academic background in this subject, but must possess a willingness to actively engage in self-reflection and experience-based learning.

Course Description: The Universal Human Values course is designed to foster holistic personal development and interpersonal skills through active, experience-based learning. The curriculum guides students in mastering self-management techniques, including time management, stress reduction, and SWOT analysis, equipping them to handle real-world challenges like peer pressure and anger effectively. Furthermore, by emphasizing priority management and dedication, the course empowers students to formulate clear academic and career goals while thoughtfully balancing the expectations of their family, peers, society, and the nation.

Course Objective:

- To introduce students to fundamental self-management skills, including SWOT analysis and time management, equipping them to effectively cope with stress, anger, and peer pressure.
- To foster an understanding of healthy interpersonal dynamics by teaching students how to navigate competition, express gratitude, and constructively resolve conflicts in their relationships.

Course Outcomes:

CO	**After the completion of the course the student should be able to :-**
CO1	Describe self-management techniques, including time management and SWOT analysis, to foster personality development and effectively handle stress, anger, and peer pressure.
CO2	Demonstrate effective interpersonal skills by navigating competition and cooperation, expressing gratitude, and resolving various types of conflicts in personal and academic relationships.
CO3	Formulate clear academic and career goals by effectively managing priorities and aligning personal dedication with the expectations of family, peers, society, and the nation.
CO4	Assess personal well-being through continuous feedback and self-evaluation techniques to maintain a healthy lifestyle, implement a balanced diet, and cultivate a caring attitude towards nature.

CO-PO MAPPING:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**	**PSO1**	**PSO2**
CO1	-	-	-	-	-	1		2	2	1	1	-	-
CO2	-	-	-	-	-	2		3	3	3	0	-	-
CO3	-	-	-	-	-	3		2	2	1	2	-	-
CO4	-	-	-	-	-	2	3	2	1	0	0	-	-

ASSESSMENT SCHEME:

Two components of Continuous Assessment (CA-1, CA-2) having 50% weightage each.

Assessment Component	Marks
CA1	25
MSE	--
CA2	25
ESE	--

CA1 and **CA2** are based on Assignment / Declared test / Quiz / Seminar / Group discussions presentation, etc.

COURSE CONTENTS:

Unit No.	Unit Title and Contents	Hours
1.	**Self-Management** Self-confidence, peer pressure, time management, anger, Stress, Personality Development, Self-improvement, SWOT analysis	05
2.	**Relationships** Home sickness, gratitude towards parents, teachers and others Ragging and interaction Competition and cooperation, Types of conflicts and conflict resolution.	**05**
3.	**Individual academic, career** Expectations of family, peers, society, nation, fixing the goals. Time management, priority management, Dedication, devotion.	**05**
4	**Self-evaluation and Healty life** Sharing and feedback Health issues, healthy diet, healthy lifestyle. Caring the nature, Self evaluation techniques.	**05**

(* Focus should be activity based learning or experience based learning)

TEXTBOOK:

Sr. No	Title	Author	Publisher
1	A Foundation Course in Human Values and Professional Ethics.	R R Gaur, R Asthana, G P Bagaria	ISBN 978-93-87034-47-1, Excel Books, New Delhi.
2	Professional Ethics and Human Values	Premvir Kapoor	Khanna Book Publishing, New Delhi,

REFERENCE BOOKS:			
Sr. No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Ethics for Scientists &Engineers,		Oxford University Press
2.	Human Values	A N Tripathy	New Age International Publishers.
3.	Foundations of Ethics and Management	B P Banerjee	Excel Books

Title of the Course: Electronics Devices and Circuits Laboratory	**L**	**T**	**P**	**Credit**
Course Code: 25ECE2302L	**--**	**--**	**2**	**1**

Course Pre-Requisite:

- Basic knowledge of electronic components
- Understanding of diode, BJT, and FET fundamentals
- Basic circuit analysis

Course Description:

This laboratory course focuses on **practical implementation, analysis, and verification** of analog electronic circuits. Students will perform experiments on diodes, transistors, amplifiers, oscillators, and power supplies.

Course Objectives:

1. To implement and test analog electronic circuits.
2. To analyze experimental results and compare with theoretical values.
3. To develop skills in measurement using CRO, DSO, and millimeters.
4. To design simple PCB layouts for electronic circuits.
5. To enhance documentation and reporting skills.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Explain the operation and characteristics of BJT and MOSFET devices.
CO2	Analyze and design BJT and MOSFET biasing and amplifier circuits.
CO3	Understand the architecture and performance parameters of Operational Amplifiers.
CO4	Design and analyze linear Op-Amp circuits for signal conditioning.
CO5	Design and implement non-linear Op-Amp applications for practical engineering systems.

Co-Po Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**	**PSO1**	**PSO2**
CO1	3	2			1						1		
CO2	3	3	2	1	2						1	2	
CO3	3	2			1						1	2	
CO4	3	3	3	2	2						1		2
CO5	3	3	3	2	3						1		2

Assessment Scheme:
Two components of Continuous Assessment (CA-1, CA-2) having 50% weightage each.

Assessment Component	Marks
CA1	25
CA2	25
POE	--

CA1 and **CA2** have 50% weightage each, and are based on practical performance and oral examination.

Course Contents

Sr. No.	List of the Experiments	Hours
1.	Design and Analysis of Single Stage CE Amplifier.	2
2.	Design and Implementation of Common Source MOSFET Amplifier.	2
3.	Design and Implementation of Voltage Divider Bias Circuit.	2
4	Design and Implementation of Inverting and Non-Inverting Amplifiers.	2
5	Design and Implementation of Inverting Summing Amplifier.	2
6	Design and Implementation of Comparator	2
7	Design and Implementation of Schmitt Trigger.	2
8	Design and Implementation of Zero crossing detector.	2
9	Design and Implementation of Differentiator Circuit	2
10	Design and Implementation of Integrator Circuit	2

Text Books:

Sr.No	Title	Author	Publisher
1.	Electronic Circuit Analysis	Donald Neamen	Tata Mc-Graw Hill
2.	Integrated Electronics	Milliman Halkanes	Prentice Hall

Reference Books:			
1.	Electronics Devices and Circuits	Boylestad	Prentice Hall

Title of the Course: Digital electronics and microprocessor Laboratory **Course Code:** 25ECE2303L	**L**	**T**	**P**	**Credit**
	--	**--**	**2**	**1**

Course Pre-Requisite: Basic knowledge of numbering system and logic gates.

Course Description: This course introduces the fundamentals of digital electronics and 8085 microprocessor systems. It covers combinational and sequential logic design using Boolean algebra, K-maps, logic gates, flip-flops, counters and registers. The course also explains 8085 architecture, addressing modes and assembly language programming. In addition, it includes interfacing of memory and peripheral devices such as 8255, ADC, DAC, seven segment displays and stepper motors for basic digital and embedded system applications.

Course Objectives:

1. Understand the fundamentals of digital electronics and apply Boolean algebra and K-map techniques for simplification and design of combinational logic circuits.
2. Analyze and design sequential logic circuits using flip-flops, registers, shift registers and counters.
3. Understand the architecture, organization and addressing modes of the 8085 microprocessor.
4. Develop assembly language programs using 8085 instruction set for arithmetic, logical, branching and control operations..
5. Interface memory and peripheral devices such as 8255, 8279, ADC, DAC, stepper motor and display systems with 8085 microprocessor.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Simplify and design combinational logic circuits using Boolean algebra, K-maps and standard logic gates.
CO2	Analyze and design sequential circuits using flip-flops, registers and counters.
CO3	Explain architecture, organization and addressing modes of 8085 microprocessor.
CO4	Develop assembly language programs using 8085 instruction set for arithmetic, logical and control applications.
CO5	Interface peripheral devices with 8085 microprocessor for real-time applications.

CO-PO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**P011**	**PSO1**	**PSO2**
CO1	3	3	3	1	2							2	
CO2	3	3	3	2	2							2	
CO3	3	2	1		1							2	
CO4	3	3	2	2	2					1			3
CO5	3	3	3	2	3	1			1	1			2

Assessment Scheme:
Two components of Continuous Assessment (CA-1, CA-2), and Practical Oral Examination (POE) having 50% and 50% weightage respectively.

Assessment Component	Marks
CA1	25
CA2	25
POE	50

CA1 and **CA2** have 50% weightage each, and are based on practical performance and oral examination. **POE** is based on 100% course content.

Course Contents

Sr. No.	List of Experiments	Hours
1.	Study of the Basic Logic Gates.	2
2.	Study of the Half Adder & Full Adder	2
3.	Study of the Multiplexer (IC-74151) & De- Multiplexer (IC-74138).	2
4.	Study of the Decade Counter (IC-7490).	2
5.	Study of the J-K Flip/Flop T- Flip/Flop.	2
6.	Perform 16 bit addition and Subtraction.	2
7.	Perform 16 bit Multiplication and division	2
8.	Perform BCD Addition and Subtraction.	2
9.	Perform block Transfer and Block exchange.	2
10.	Interfacing of 7 segment display to 8085 using 8255.	2

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Digital Circuits	Anand Kumar	PHI
2.	Microprocessor-Architecture, programming and application with 8085	gaonkar	Penram international.
3.	The 8085 microcontroller & embedded system, using assembly and C	M. A. Mazidi	2nd edi, pearsonedu

Reference Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Modern digital electronics‖	R.P. Jain	3rd edition, 12threprint Tata McGraw Hill Publication,2007
2.	An Engineering Approach to Digital Design	WilliamI .Fletcher	PHI/Pearson
3.	Microprocessors & Interfacing	Douglas V. Hall	McGraw Hill International Edition, 1992

Title of the Course: Data Structure Laboratory using C++	**L**	**T**	**P**	**Credit**
Course Code: 25ECE2304L	**--**	**--**	**2**	**1**

Course Pre-Requisite: A student should know basic programming (such as C programming language or Python), fundamental mathematics, and problem-solving skills before studying Data Structures.

Course Description: This course explores the fundamental concepts and implementation of core data structures like arrays, lists, trees, and graphs, while equipping students with the ability to evaluate algorithmic efficiency for real-world computational problems.

Course Objectives:

- To understand fundamental concepts and implementation of core data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
- To develop the ability to analyze and evaluate algorithm efficiency using time and space complexity.
- To design and implement efficient algorithms using appropriate data structures for real-world problems.
- To apply problem-solving techniques and logical thinking in optimizing computational solutions.
- To understand memory management and data organization for efficient data storage and retrieval.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Students will be able to implement and use various data structures such as arrays, linked lists, stacks, queues, trees, and graphs.
CO2	Students will be able to analyze algorithms using time and space complexity techniques.
CO3	Students will be able to select appropriate data structures for solving specific computational problems.
CO4	Students will be able to design efficient algorithms and apply problem-solving strategies to real-world scenarios.
CO5	Students will be able to demonstrate understanding of memory utilization and optimize data storage and retrieval mechanisms.

CO-PO MAPPING:

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

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), and Practical Oral Examination (POE) having 50% and 50% weightage respectively.

Assessment Component	Marks
CA1	25
CA2	25
POE	50

CA1 and **CA2** have 50% weightage each, and are based on practical performance and oral examination. **POE** is based on 100% course content.

Course Contents:

Unit No.	List of Experiments	Hours
1.	Write a program to implement classes and objects using C++.	2
2.	Array Operations: Write a program to perform insertion, deletion, and traversal on arrays (lists).	2
3.	Linked List: Implement singly linked list with operations: insertion, deletion, and display.	2
4.	Doubly Linked List: Implement doubly linked list and perform forward and backward traversal.	2
5.	Stack Implementation: Implement a stack and perform push, pop operations.	2
6.	Queue Implementation: Implement a queue and perform enqueue and dequeue operations.	2
7.	Circular Queue: Implement circular queue and demonstrate overflow and underflow conditions.	2
8.	Tree Traversals: Create a binary tree and implement in order, preorder, and post order traversal.	2
9.	Binary Search Tree (BST): Implement BST with insertion, deletion, and searching operations.	2
10.	Graph Traversal: Implement graph using adjacency list and perform BFS and DFS traversal.	2
11.	Sorting Algorithms: Implement Bubble Sort, Selection Sort, and Merge Sort and compare performance.	2

*Students shall perform selected problem-solving experiments and coding exercises based on programming challenges available on platforms such as HackerRank and HackerEarth

Text Books:

Sr.No	Title	Author	Publisher
1.	Data Structures and Algorithms Made Easy	Narasimha Karumanchi	CareerMonk Publications
2.	Introduction to Algorithms	Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein	MIT Press
3.	Data Structures and Algorithm Analysis in C++	Mark Allen Weiss	Pearson
4.	Data Structures.	P. Sudarshan, J John Manoj Kumar	CBS Publishers & Distributors

Reference Books:

Sr.No	Title	Author	Publisher
1.	The Algorithm Design Manual	Steven S. Skiena	Springer
2.	Advanced Data Structures	Peter Brass	Cambridge University Press

Title of the Course: Introduction to Web Development Laboratory **Course Code:** 25MMECE2301L	**L**	**T**	**P**	**Credit**
	--	**--**	**2**	**1**

Course Pre-Requisite: Basic knowledge of computers, internet usage, and file management is required. Familiarity with text editors such as Visual Studio Code and basic programming concepts is recommended.

Course Description: This course introduces the fundamentals of web development using HTML5, CSS3, and responsive design principles. Students will learn to create structured webpages, apply styling techniques, and develop user-friendly web interfaces. The course also covers modern layout methods, responsive web design, and frontend frameworks such as Bootstrap. By the end of the course, students will be able to design and develop responsive static websites independently.

Course Objectives:

- To understand the fundamentals of web development and design structured web pages using HTML5 elements and semantic tags.
- To apply CSS techniques for styling, layout management, and responsive web page design.
- To develop JavaScript programs using control structures, functions, arrays, objects, and modern scripting features.
- To build interactive and dynamic web applications using DOM manipulation, event handling, form validation, and asynchronous JavaScript.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Understand the concepts of HTML5 and apply HTML elements, forms, tables, multimedia, and semantic tags in web page development.
CO2	Understand CSS concepts and apply styling, layout design, box model, Flexbox, Grid, and responsive design techniques for web pages.
CO3	Develop JavaScript programs using variables, operators, control structures, functions, arrays, objects, and ES6 features.
CO4	Build interactive web applications using DOM manipulation, event handling, form validation, asynchronous JavaScript, and Fetch API integration.

Co-Po Mapping:

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

Assessment Scheme:
Two components of Continuous Assessment (CA-1, CA-2) having 50% weightage each.

Assessment Component	Marks
CA1	25
CA2	25
POE	--

CA1 and **CA2** have 50% weightage each, and are based on practical performance and oral examination.

Course Contents:

Unit No.	List of Experiments	Hours
1.	Create a basic HTML5 webpage demonstrating headings, paragraphs, lists, hyperlinks, and text formatting tags.	2
2.	Design a webpage using HTML tables, images, audio, video, and iframe elements.	2
3.	Develop an online registration form using various HTML form controls and semantic HTML elements.	2
4.	Apply different types of CSS to style a webpage using selectors, colors, backgrounds, borders, margins, and padding.	2
5.	Design responsive webpage layouts using CSS Box Model, Flexbox, and CSS Grid.	2
6	Create a responsive web page using media queries for different screen sizes and devices.	2
7	Write JavaScript programs demonstrating variables, operators, conditional statements, loops, and functions.	2
8	Develop JavaScript programs using arrays, strings, objects, and ES6 features.	2
9	Create an interactive webpage using DOM manipulation and event handling techniques.	2
10	Develop a mini web application with form validation and Fetch API integration for dynamic data	2

Text Books:

Sr.No	Title	Author	Publisher
1.	HTML and CSS: Design and Build Websites	Jon Duckett	Wiley Publications.
2.	Learning Web Design	Jennifer Niederst Robbins	O'Reilly Media
3.	Beginning HTML, XHTML, CSS, and JavaScript.	Jon Duckett	Wiley India.

Reference Books:			
Sr.No	**Title**	**Author**	**Publisher**
1.	Responsive Web Design with HTML5 and CSS	Ben Frain	Packt Publishing
2.	Web Design with HTML, CSS, JavaScript and jQuery Set	Jon Duckett	Wiley Publications
3.	Bootstrap 5 Essentials	Sachin Pant	BPB Publications