COURSE BOOK B. TECH. I YEAR

(Autonomous)

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CURRICULUM STRUCTURE & SYLLABUS

Effective from the Session: 2024-25

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1. Teaching Scheme of (B. Tech. I Year) Department wise

1.1 Computer Science and Engineering (CSE)/Computer Science (CS)/ Computer Science and Information Technology (CSIT)/ Information Technology (IT)

B.Tech (CSE/CS/CSIT/IT) 1st Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L/ CH101L	Semiconductor Physics and Devices / Environmental Chemistry	L	3 2	0 0	0 0	60 40	15 10	75 50	75 50	150 100	3 2
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	BS/ES	Major (Core) / Minor Stream	ASH/ ECE	MA202L/ EC201L	Discrete Structures & Theory of Logic/ Computer Organization & Logic Design	L	3	0	0	60	15	75	75	150	3
5	ES	Minor Stream	EEE/ ME	EE101B/ ME101B	IoT and Embedded Systems/ Design & Realization	B	2	0	0	40	10	50	50	100	2
6	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
7	BS/ES	Minor Stream	ASH/ ECE	PH101P/ EC201P	Semiconductor Physics and Devices Lab/ Computer Organization & Logic Design Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
9	ES	Minor Stream	EEE/ ME	EE101P/ ME101P	IoT and Embedded Systems Lab/ Design & Realization Lab	P	0	0	2	-	25	25	25	50	1
10	PC	Major (Core)	IT	IT102B	Web Designing	B	0	0	2	-	50	50	-	50	1
11	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	20	100	-	100	2
12	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**15**	**1**	**16**					**1150**	**23**

B. Tech (CSE/CS/CSIT/IT) 2nd Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA103L	Linear Algebra for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L/ PH101L	Environmental Chemistry/ Semiconductor Physics and Devices	L	2 3	0 0	0 0	40 60	10 15	50 75	50 75	100 150	2 3
3	ES/BS	Minor Stream/ Major (Core)	ECE/ASH	EC201L/ MA202L	Computer Organization & Logic Design/ Discrete Structures & Theory of Logic	L	3	0	0	60	15	75	75	150	3
4	ES	Minor Stream	ME/EEE	ME101B / EE101B	Design & Realization/ IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
Blended															
5	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
Lab/Practical															
6	ES/BS	Minor Stream	ECE/ASH	EC201P/ PH101P	Computer Organization & Logic Design Lab/ Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
7	ES	Minor Stream	ME/EEE	ME101P / EE101P	Design & Realization Lab/ IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	P	0	0	4	-	50	50	50	100	2
9	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
10	PW	Value Added Courses for all UG	ID	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
11	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**13**	**1**	**18**					**1100**	**22**

1.2 Computer Science and Engineering (AI)/ Computer Science and Engineering (AI&ML)

B.Tech (CSE(AI)/CSE(AI&ML)) 1st Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L/ CH101L	Semiconductor Physics and Devices / Environmental Chemistry	L	3 2	0 0	0 0	60 40	15 10	75 50	75 50	150 100	3 2
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	BS/ES	Major (Core) / Minor Stream	ASH/ ECE	MA202L/ EC201L	Discrete Structures & Theory of Logic/ Computer Organization & Logic Design	L	3	0	0	60	15	75	75	150	3
5	ES	Minor Stream	EEE	EE101B	IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
6	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
7	BS/ES	Minor Stream	ASH/ ECE	PH101P/ EC201P	Semiconductor Physics and Devices Lab/ Computer Organization & Logic Design Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
9	ES	Minor Stream	EEE	EE101P	IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
10	PC	Major (Core)	IT	IT102B	Web Designing	B	0	0	2	-	50	50	-	50	1
11	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	20	100	-	100	2
12	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**15**	**1**	**16**					**1150**	**23**

B. Tech (CSE(AI)/CSE(AI&ML)) 2nd Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA103L	Linear Algebra for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L/ PH101L	Environmental Chemistry/ Semiconductor Physics and Devices	L	2 3	0 0	0 0	40 60	10 15	50 75	50 75	100 150	2 3
3	ES/BS	Minor Stream/ Major (Core)	ECE/ASH	EC201L/ MA202L	Computer Organization & Logic Design/ Discrete Structures & Theory of Logic	L	3	0	0	60	15	75	75	150	3
Blended															
4	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
5	ES	Minor Stream	CSE(AIML)	AI101B	Introduction to AI	B	2	0	2	60	15	75	75	150	3
Lab/Practical															
6	ES/BS	Minor Stream	ECE/ASH	EC201P/ PH101P	Computer Organization & Logic Design Lab/ Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
7	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	P	0	0	4	-	50	50	50	100	2
8	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
9	PW	Value Added Courses for all UG	ID	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
10	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**13**	**1**	**18**					**1100**	**22**

1.3 Electronics and Communication Engineering (ECE)

B.Tech (ECE) 1st Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L	Environmental Chemistry	L	2	0	0	40	10	50	50	100	2
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	ES	Minor Stream	ECE	EC201L	Computer Organization & Logic Design	L	3	0	0	60	15	75	75	150	3
5	ES	Minor Stream	ME	ME101B	Design & Realization	B	2	0	0	40	10	50	50	100	2
6	PC	Major (Core)	ECE	EC202L	Intelligent Health Care Systems	L	1	0	0	40	10	50	-	50	1
7	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
8	ES	Minor Stream	ECE	EC201P	Computer Organization & Logic Design Lab	P	0	0	2	-	25	25	25	50	1
9	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
10	ES	Minor Stream	ME	ME101P	Design & Realization Lab	P	0	0	2	-	25	25	25	50	1
11	PC	Major (Core)	ECE	EC202P	Intelligent Health Care Systems Lab	P	0	0	2	-	50	50	-	50	1
12	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	20	100	-	100	2
13	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**15**	**1**	**16**					**1150**	**23**

B. Tech (ECE) 2nd Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA103L	Linear Algebra for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L	Semiconductor Physics and Devices	L	3	0	0	60	15	75	75	150	3
3	ES	Minor Stream	EEE	EE101B	IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
4	ES	Minor Stream	EEE	EE102L	Explorations in Electrical Engineering	L	2	0	0	40	10	50	50	100	2
Blended															
5	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
Lab/Practical															
6	BS	Minor Stream	ASH	PH101P	Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
7	ES	Minor Stream	EEE	EE101P	IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	P	0	0	4	-	50	50	50	100	2
9	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
10	PW	Value Added Courses for all UG	ID	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
11	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 32 hrs.							**13**	**1**	**18**					**1100**	**22**

1.4 Electrical and Electronics Engineering (EEE)

B.Tech (EEE) 1st Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L	Semiconductor Physics and Devices	L	3	0	0	60	15	75	75	150	3
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	ES	Minor Stream	EEE	EE102L	Explorations in Electrical Engineering	L	2	0	0	40	10	50	50	100	2
5	ES	Minor Stream	EEE	EE101B	IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
6	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
7	BS	Minor Stream	ASH	PH101P	Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
9	ES	Minor Stream	EEE	EE101P	IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
10	ES	Minor Stream	EEE	EE102P	Explorations in Electrical Engineering Lab	P	0	0	2	-	25	25	25	50	1
11	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	20	100	-	100	2
12	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 31 hrs.							**14**	**1**	**16**					**1100**	**22**

B. Tech (EEE) 2nd Sem

S No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA103L	Linear Algebra for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L	Environmental Chemistry	L	2	0	0	40	10	50	50	100	2
3	ES	Minor Stream	ME	ME101B	Design & Realization	B	2	0	0	40	10	50	50	100	2
4	PC	Minor Stream	EEE	EE103L	Emerging Technologies for Engineers	L	2	0	0	40	10	50	50	100	2
5	PC	Minor Stream	EEE	EE104L	Digital Logic Design	L	2	0	0	40	10	50	50	100	2
Blended															
6	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
Lab/Practical															
7	ES	Minor Stream	ME	ME101P	Design & Realization Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	EEE	EE103P	Emerging Technologies for Engineers Lab	P	0	0	2	-	25	25	25	50	1
9	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	B	0	0	4	-	50	50	50	100	2
10	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
11	PW	Value Added Courses for all UG	IDA	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
12	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 33 hrs.							**14**	**1**	**18**					**1150**	**23**

1.5 Electrical and Computer Engineering (ELCE)

B.Tech (ELCE) 1st Sem

S.No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L	Semiconductor Physics and Devices	L	3	0	0	60	15	75	75	150	3
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	ES	Minor Stream	EEE	EE102L	Explorations in Electrical Engineering	L	2	0	0	40	10	50	50	100	2
5	ES	Minor Stream	EEE	EE101B	IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
6	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
7	BS	Minor Stream	ASH	PH101P	Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
9	ES	Minor Stream	EEE	EE101P	IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
10	ES	Minor Stream	EEE	EE102P	Explorations in Electrical Engineering Lab	P	0	0	2	-	25	25	25	50	1
11	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	100	100	-	100	2
12	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 31 hrs.							**14**	**1**	**16**					**1100**	**22**

B. Tech (ELCE) 2nd Sem

S.No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA103L	Linear Algebra for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L	Environmental Chemistry	L	2	0	0	40	10	50	50	100	2
3	ES	Minor Stream	ME	ME101B	Design & Realization	B	2	0	0	40	10	50	50	100	2
4	ES	Minor Stream	ECE	EC201L	Computer Organization & Logic Design	L	3	0	0	60	15	75	75	150	3
Blended															
5	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
Lab/Practical															
6	ES	Minor Stream	ME	ME101P	Design & Realization Lab	P	0	0	2	-	25	25	25	50	1
7	ES	Minor Stream	ECE	EC201P	Computer Organization & Logic Design Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	P	0	0	4	-	50	50	50	100	2
9	PC	Major (Core)	EEE	EE105P	Electrical Engineering Workshop	P	0	0	2	-	25	25	25	50	1
10	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
11	PW	Value Added Courses for all UG	IDA	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
12	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 34 hrs.							**13**	**1**	**20**					**1150**	**23**

1.6 Mechanical Engineering (ME)

B.Tech (ME) 1st Sem

S.No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA101L	Calculus for Engineers	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	PH101L	Semiconductor Physics and Devices	L	3	0	0	60	15	75	75	150	3
3	ES	Minor Stream	IT	IT101B	Programming For Problem Solving	B	3	0	0	60	15	75	75	150	3
4	ES	Minor Stream	EEE	EE102L	Explorations in Electrical Engineering	L	2	0	0	40	10	50	50	100	2
5	ES	Minor Stream	EEE	EE101B	IoT and Embedded Systems	B	2	0	0	40	10	50	50	100	2
6	PW	Value Added Courses for all UG	ID	ID103B	Design Thinking	B	1	0	0	40	10	50	-	50	1
Lab/Practical															
7	BS	Minor Stream	ASH	PH101P	Semiconductor Physics and Devices Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	IT	IT101P	Programming For Problem Solving Lab	P	0	0	4	-	50	50	50	100	2
9	ES	Minor Stream	EEE	EE101P	IoT and Embedded Systems Lab	P	0	0	2	-	25	25	25	50	1
10	ES	Minor Stream	EEE	EE102P	Explorations in Electrical Engineering Lab	P	0	0	2	-	25	25	25	50	1
11	HS	Value Added Courses for all UG	ASH	HS101B/ HS1XXB	Communication Skills / Foreign Language	B	0	0	4	80	100	100	-	100	2
12	MC	Skill Enhancement / Value Added Courses for all UG	ASH	HS1XXB	Self-Growth / Indian Knowledge System	B	0	0	2	10	-	10	40	-	NC
Total Hours : 31 hrs.							**14**	**1**	**16**					**1100**	**22**

B. Tech (ME) 2nd Sem

S.No.	Course Category (AICTE)	Course Category (UGC)	BOS	Course Code	Course Name	Type	Academic Learning (AL)			Continuous Internal Examination (CIE)			End Sem Examination (ESE)	Total Marks	Total Credits
							L	T	P	MSE	CA	TOTAL		CIE+ ESE	
1	BS	Major (Core)	ASH	MA104L	Differential Equations & Complex Integration	L	3	1	0	80	20	100	100	200	4
2	BS	Minor Stream	ASH	CH101L	Environmental Chemistry	L	2	0	0	40	10	50	50	100	2
3	ES	Minor Stream	ME	ME101B	Design & Realization	B	2	0	0	40	10	50	50	100	2
4	PC	Minor Stream	EEE	EE103L	Emerging Technologies for Engineers	L	2	0	0	40	10	50	50	100	2
5	PC	Major (Core)	ME	ME102L	Engineering Mechanics	L	2	0	0	40	10	50	50	100	2
Blended															
6	ES	Minor Stream	CSE	CS201B	Data Structure	B	3	0	2	80	20	100	100	200	4
Lab/Practical															
7	ES	Minor Stream	ME	ME101P	Design & Realization Lab	P	0	0	2	-	25	25	25	50	1
8	ES	Minor Stream	EEE	EE103P	Emerging Technologies for Engineers Lab	P	0	0	2	-	25	25	25	50	1
9	ES	Minor Stream	CSE(AIML)	AI102P	Python for Engineers	P	0	0	4	-	50	50	50	100	2
10	HS	Value Added Courses for all UG	ASH	HS1XXB/ HS101B	Foreign Language / Communication Skills	B	0	0	4	80	20	100	-	100	2
11	PW	Value Added Courses for all UG	IDA	ID104B	Innovation and Entrepreneurship	B	0	0	2	-	50	50	-	50	1
12	MC	Value Added Courses for all UG / Skill Enhancement	ASH	HS1XXB	Indian Knowledge System/ Self-Growth	B	0	0	2	10	-	10	40	-	NC
Total Hours : 33 hrs.							**14**	**1**	**18**					**1150**	**23**

2. Theory Courses Detail Syllabus

Course Code: MA101L	Course Name: Calculus for Engineers	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		3	1	0	4

Pre-requisite: NA

Course Objectives:

1. The objective of this course is to familiarize the graduate engineers with techniques of multivariate analysis of real, complex and vector functions in calculus.
2. It aims to impart the knowledge of tools from intermediate to advanced level that will enable them to handle complex problems and its applications so that they would find useful in their disciplines.

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

1. Apply the concept of partial differentiation in application of homogeneous and composite functions.
2. Apply knowledge of partial differentiation in extrema, series expansion of functions and Jacobians.
3. Construct the transformations using the concept of analyticity and harmonicity of complex functions.
4. Employ the concept of multiple integration to find the area of bounded region.
5. Apply the concept of vector differentials to study the properties of point functions.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Differential Calculus I	09 hours

Introduction of Limits, continuity and differentiability for function of two variables, Higher order Partial derivatives, Euler's Theorem for homogeneous functions, Total derivative of composite functions.

Unit 2	Differential Calculus II	09 hours

Taylor's and Maclaurin expansion for function of two variables, Jacobians, properties of Jacobian (without proof) Hessian Matrix, Maxima & minima for function of two variables.

Unit 3	Complex Variable – Differentiation	09 hours

Functions of complex variable, Limit, Continuity and differentiability, Analytic functions, Cauchy- Riemann equations (Cartesian and Polar form), Harmonic function, Conformal mapping, Mobius transformation.

Unit 4	Multiple Integral	09 hours

Evaluation of double integrals, change of order of integration, Change of variable (double -integral). Application of double integrals to find the area of a region.

Unit 5	Vector differentiation	09 hours

Scalar point function, Vector point function, Gradient of a scalar field, Directional derivatives, Application of divergence, curl to solenoidal and irrotational vectors respectively.

Total Lecture Hours	45 hours

Textbook:

1. B. V. Ramana, Higher Engineering Mathematics, McGraw-Hill Publishing Company Ltd., 2017
2. B. S. Grewal, Higher Engineering Mathematics, Khanna Publisher, 2020.
3. R K. Jain & S R K. Iyenger, Advanced Engineering Mathematics, Narosa Publishing House 2017.

Reference Books:

1. Dan Hamilton, Calculus 1 - Differentiation and Integration, Hamilton Education Guides 2018.
2. Maurice D. Weir, Joel Hass, Frank R. Giordano, Thomas' Calculus, Pearson, 2002.
3. Peter V. O'Neil, Advanced Engineering Mathematics, Thomson (Cengage) Learning, 2007.
4. E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 2015.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1	MSE2	CA1	CA2	CA3	CA4	CA5		
40	40	5	5	5	(ATT) 5	5		
80		Best of 5 (20)					100	200

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: PH101L	Course Name: Semiconductor Physics and Devices	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		3	0	0	3

Pre-requisite: NA

Course Objectives:

To impart the technical aspect of semiconductor Physics and devices to engineering graduates so that they are able to assess and contribute to the solution of technical and engineering problems that are based on broad principles of Physics including solid state physics, semiconductors, optoelectronics devices and Quantum Physics.

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

1. Illustrate the basic concept of crystalline materials and their appropriate use.
2. Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.
3. Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.
4. Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.
5. Apply the concept of Quantum Physics to study various phenomenon.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Crystal Structures	09 hours

Distinction between crystalline, Polycrystalline, and Amorphous materials, Space lattice, basis, Unit cell, Lattice parameter, seven crystal systems and Fourteen Bravais lattices, Diamond crystal structure, Packing factor (cubic, body and face), Lattice planes and Miller Indices, Bragg's law.

Unit 2	Semiconductors	11 hours

Band Theory of Solids, Fermi-Dirac distribution, Free carrier density (electrons and holes), Conductivity of semiconductors, Fermi level in intrinsic and extrinsic semiconductors, Bipolar junction transistor, p-n-p and n-p-n transistors, Introduction of FET and MOSFET, I-V characteristics, Capacitance, CMOS circuits.

Unit 3	Semiconducting Devices	09 hours

Solar Cell: Photovoltaic effect, Construction and working of solar cell, I-V characteristics of solar cell, Conversion efficiency, Fill factor, Applications of solar cells. Photodetectors: Principle of photodetector, Construction and working of photodiode and PIN diode, Applications of photodetectors.

Unit 4	Optoelectronic Devices	08 hours

Light Emitting Diode (LED): Direct and indirect band gap semiconductors, Electron-hole pair generation and recombination, non-radiative and radiative recombination in semiconductors, Differences between homo and hetero junction LEDs, Construction and working of homo junction LED, Characteristics, quantum efficiency, advantages, and applications of LED.

Unit 5	Quantum Mechanics	08 hours

Inadequacy of classical mechanics, Planck's theory of black body radiation (qualitative), de-Broglie concept of matter waves, Heisenberg's uncertainty principle, Phase velocity and group velocity, Time-dependent and time-independent Schrodinger wave equations, Physical interpretation of wave function, Particle in a one- Dimensional box.

Total Lecture Hours	45 hours

Textbook:

1. Donald A. Neamen, Semiconductor Physics and Devices, 4th Edition, Mc Graw Hill Education, 2012.
2. S.M. Sze, Semiconductor Physics and Devices, 3rd Edition, Wiley, 2021
3. S.O. Pillai, Solid State Physics, 10th Edition, New Age International Publishers, 2022

Reference Books:

1. V.K. Mehta, Principle of Electronics, 12th Edition, S. Chand, 2020
2. Ben G. Streetman, Solid State Electronic Devices, 7th Edition, Pearson, 2015.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1	MSE2	CA1	CA2	CA3	CA4	CA5		
30	30	4	4	4	(ATT) 3	4		
60		Best of 5 (15)					75	150

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: CH101L	Course Name: Environmental Chemistry	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		2	0	0	2

Pre-requisite: NA

Course Objectives:

The objective of this course is to impart the technical aspect of Chemistry and Environment Sciences to engineering graduates so that they are able to assess and contribute to the solution of technical and engineering problems that are based on broad principles of Chemistry and Environment Sciences.

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

1. Understand the knowledge of advanced materials for interdisciplinary applications.
2. Employ the concept of electrochemistry for portable energy devices to provide viable solutions for industrial problems.
3. Understand the insight of environment pollution and its mitigation for sustainable development.
4. Understand the environment related issues, their impacts and provide the sustainable solutions.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	1	1	-	1	1	-	-	-	-	1
CO2	2	2	1	2	-	1	1	-	-	-	-	1
CO3	2	2	1	1	-	2	2	-	-	-	-	2
CO4	2	2	1	1	-	2	2	-	-	-	-	2

Unit 1	Advanced Materials for Smart Devices	07 hours

Chemical bonding, Advanced Materials structure, properties and their applications: Chromo active materials (Liquid crystals), Nanomaterials, Polymeric Materials-PANI and PEDOT in sensors, PMMA in smart devices, Sustainable polymers (PLA, PGA, PHBV), Leaching of Micro-plastics.

Unit 2	Eco-friendly Portable Energy Convertible Devices	08 hours

Introduction to Electrochemistry, Galvanic Cell, Green Batteries and their applications. **Photovoltaic cell:** Production of solar grade silicon and its properties, doping of silicon, Dye sensitized solar cells. **Green Fuel cell:** Methanol-Oxygen fuel cell, Hydrogen-based fuel cell to decarbonize the global energy, storage and its applications.

Unit 3	Environmental Systems: The Chemistry of Air, Soil, and Water	08 hours

Environmental segments: Composition and segments of Atmosphere. **Air pollution**: Introduction, major sources of air pollution, air pollutants, Effect of pollutants on humans, materials and vegetation. **Greenhouse effect and global warming**: El Nino and La Nina phenomenon. **Ozone layer:** Creation, mechanism of depletion and its effect. Smog: Sulphurous and photochemical smog, formation mechanism, and its control. **Water pollution:** Properties of water, water Pollution Sources, water treatment and purification technologies **Soil pollution:** Origin and nature of soil, sources of soil pollution. soil pollution and plant growth, soil remediation techniques.

Unit 4	Environmental Toxicology & Waste management	07 hours

Toxicants: Types and sources of environmental toxicants, physiological response to toxicants (Mutagenesis, Carcinogenesis, Teratogenesis), Case Studies of Toxic Events and Responses. **Waste management:** Types of waste (e.g., municipal solid waste, hazardous waste, industrial waste, e-waste, biomedical waste), Waste Management Strategies (e.g., recycling, treatment, disposal), Remediation Technologies (bioremediation), Environmental Policies and Regulations. **Sustainable Development:** Concepts and definition,17 SDGs with a focus on relevant goals, SDG Goals by 2030 (Principles, challenges, global initiative and policies).

Total Lecture Hours	30 hours

Textbook:

1. Rajaram J., Kuriacose J. C.,"Chemistry in Engineering and Technology", Vol.1, Tata McGraw-Hill, India, 2018.
2. Fahlman B. D., "Materials Chemistry", Germany, Springer Netherlands, 2018.
3. Deswal S., "Environmental Studies" Dhanpat Rai & Co., 2012.

Reference Books:

1. Hwang N.M., "Non-Classical Crystallization of Thin Films and Nanostructures in CVD and PVD Processes" Springer, Netherland, 2016.
2. Billmayer F.W., "Textbook of Polymer Science", 3rd Ed. Wiley, 2007.
3. Rajgopalan R. "Environmental Studies" Ed. III, Oxford University Press, 2016.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1	MSE2	CA1	CA2	CA3	CA4	CA5		
20	20	2	2	3	(ATT) 3	3		
40		Best of 5 (10)					50	100

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: IT101B	Course Name: Programming for Problem Solving	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		3	0	0	3

Pre-requisite: Computer block diagram, Generation of programming languages, Translators, Flowchart

Course Objectives:

1. Given a computational problem, identify and abstract the programming task involved.
2. Approach the programming tasks using techniques learned and write pseudo-code.
3. Choose the right data representation formats based on the requirements of the problem.
4. Use comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
5. By learning the basic programming constructs, students can easily switch over to any other language in future.

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

1. Apply programming constructs of C language to solve real-world problems.
2. Use the concepts of looping, branching, and decision-making statements for a given problem.
3. Develop Solutions to problems using modular programming constructs such as functions and recursion.
4. Demonstrate the ability to write C programs using pointers, strings structures and unions.
5. Design a solution to problems using the concepts of pointers and files handling.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Introduction	09 hours

Introduction: Algorithm, Structure of C program, Writing the first C program, Compilation and execution process. Tokens: Keywords, Identifier, Variables, Constants, Strings, Character set.

Operators: Arithmetic, Relational, Equality, logical, Unary, Conditional, Bitwise, Comma, Operator precedence and associativity, type conversion, and type casting.

Best Practices in Code writing: Naming Conventions and Importance of Comments to enhance the readability of the program.

Unit 2	Decision Control and Looping Statements	09 hours

Decision Statements: Conditional Branching statements: if, if-else, if-else-if, switch case.

Iterative statements: while, do-while, for loop and Nested loops, Break and continue statements.

Unit 3	Functions & Recursion	09 hours

Functions & Recursion: Need for function, function declaration /Function prototype, Function Definition, Function calling. Passing parameter to the Function: Call by value and call by reference Scope: Block scope, function scope. **Storage Classes:** Auto, register, Extern, static, Recursion

Unit 4	Arrays, Strings &Structures	09 hours

Arrays, Strings &Structures: Fundamental of Array: One dimension Array, Declaration, Initialization. Operations on Array: Insertion, deletion, Traversing. Passing 1D array to functions, 2-D array and its operations

Pointers: Pointer: Introduction, Pointer declaration, and Pointer Arithmetic, Pointer and Arrays, Pointer to Pointer, Arrays of Pointers.

Applications of pointer: Dynamic memory allocation.

Unit 5	String and File Handling	09 hours

String handling: Reading, writing strings, String functions: strlen( ), strcpy( ),strcat( ),strrev (), strcmp( ), and their implementation as user-defined**. Structure & Union:** Introduction of Structures: Structure declaration, Initialization, Accessing the member of structure. Nested structure and Array of structure. Passing individual members, Passing the entire structure. Introduction to Union.

File Handling: Introduction to file Handling.

Total Lecture Hours	45 hours

Textbook:

1. Herbert Schildt. "TheCompleteReferenceC",4th Edition, TMH,2017
2. Brian W. Kernighanand Dennis M. Ritchie, "The C programming language",2nd Edition, Pearson Education India,2015
3. Let Us C: Authentic guide to C programming language - Nineteenth edition (December 2022); BPB Publications, Ansari Road, Dariya Ganj

4. E. Bala Guruswamy, Programming in ANSI C", Eighth edition, TMH,2019
5. Ashok N. Kamthane and Amit A Kamthane "Programming in C", 3rdEdition, Pearson Education,2015

Reference Books:

1. B. A. Forouzan, R. F. Gilberg, B.G. Geetha, and G. Singaravel, "Computer Science: A structured Programming Approach Using C", 3rd Edition, Cengage, New Delhi,2012
2. H. Cooperand H. Mullish, "TheSpiritofC",4thEdition, JaicoPublishingHouse,2006
3. Paul Deitel, Harvey Deitel, "C How to Program", 8th Edition (February 2015), Pearson.

Mode of Evaluation

MSE		CA					ESE	Total	
MSE1 30	MSE2 30	CA1 4	CA2 4	CA3 4	CA4 (ATT) 3	CA5 4			
60		Best of 5 (15)					75	150	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: MA202L	Course Name: Discrete Structures & Theory of Logic	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)		3	0	0	3

Pre-requisite: NA

Course Objectives:

1. The objective of this course is to familiarize the graduate students with the fundamentals of discrete structure and theory of logics.
2. It aims to apply the theory of inferences and graphs in solving the advanced technological problems.

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

1. Acquire knowledge of sets, relations, Poset and lattices to solve ordered structures and their relationship problems
2. Apply fundamental concepts of functions and Boolean algebra in logical reasoning and computational abilities.
3. Employ the rules of propositions, theory of inferences and predicate logic in logical reasoning problems.
4. Understand the concepts of algebraic structures and their applications to apply in critical thinking
5. Apply the concept of graph theory in solving shortest path engineering problems.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	-	-	-	-	1	-	-	-	2
CO2	2	2	-	2	-	-	-	1	-	-	-	2
CO3	2	2	-	2	-	-	-	1	-	-	-	2
CO4	2	2	2	2	-	-	-	1	-	-	-	2
CO5	2	2	2	2	-	-	-	1	-	-	-	2

Unit 1	Sets, Relations, Poset & Lattices	09 hours

Set Theory& Relations: Introduction, Combination of sets. Relations: Definition, Operations on relations, Properties of relations, Composite Relations, Equality of relations, Recursive definition of relation, Order of relations. **POSET & Lattices:** Hasse Diagram, POSET, Definition & Properties of lattices – Bounded, Complemented, Distributed, Modular and Complete lattice. **Application of Sets and Posets:** Discuss the allocation or segregation problems using Set theory Discuss set of tasks in a project management using Posets and Hasse diagram.

Unit 2	Functions & Boolean Algebra	09 hours

Functions: Definition, Classification of functions, Operations on functions. Growth of Functions. **Boolean Algebra:** Introduction, Axioms and Theorems of Boolean algebra, Algebraic manipulation of Boolean expressions. Simplification of Boolean Functions, Karnaugh maps. **Application of Boolean Algebra:** Discuss one or two case studies of application of Boolean algebra in digital circuit design.

Unit 3	Theory of Logics	09 hours

Theory of Logics: Proposition, Truth tables, Tautology, Satisfiability, Contradiction, Algebra of proposition, Theory of Inference. Predicate Logic: First order predicate, well- formed formula of predicate, quantifiers, Inference theory of predicate logic. **Applications of Predicate Logics:** Discuss the case studies like Family- Tree, Water-Jug, Monkey-Banana problems, etc.

Unit 4	Algebraic Structures	09 hours
Algebraic Structures: Definition, Groups, Subgroups and order, Cyclic Groups, Cosets, Lagrange's theorem, Normal Subgroups, Permutation and Symmetric groups, Group Homomorphisms, Definition and elementary properties of Rings and Fields. **Applications of Group Theory:** Coordination of Robot Arms in a Factory, Allocating Resources for a Community Garden.		
Unit 5	**Graph Theory**	**09 hours**
Graphs: Definition and terminology, Representation of graphs, Multigraphs, Bipartite graphs, Planar graphs, Isomorphism and Homeomorphism of graphs, Euler and Hamiltonian paths, Graph coloring. **Applications of Graphs:** Discuss one or two case studies like Finding shortest path: travelling sales man problem, Chinese postman problem		
	Total Lecture Hours	**45 hours**

Textbook:

1. Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", Tata McGraw Hill. 1997 2nd edition Reprint 2017
2. Swapan Kumar Sarkar, A Textbook of Discrete Mathematics, S Chand Publishing.

Reference Books:

1. C. L. Liu, Elements of Discrete Mathematics: A Computer Oriented Approach, McGraw Hill. 4th edition (Paperback 2017)
2. Narsingh Deo, Graph Theory with Applications to Engineering and Computer Science, PhI Learning
3. E.R. Scheinerman, Mathematics: A Discrete Introduction, Brooks/Cole, 3rd edition
4. Thomas Koshy, Discrete Mathematics with Application, Elsevier Pub. 2004
5. Kenneth H. Rosen, Discrete Mathematics and Its Applications, McGraw-Hill
6. Liptschutz, Seymour, "Discrete Mathematics", McGraw Hill, 3rd edition (Paperback 2017)
7. B. Kolman, R.C. Busby, and S.C. Ross, Discrete Mathematical Structures, Prentice Hall, 3rd edition

Mode of Evaluation

MSE		CA					ESE	Total
MSE1	MSE2	CA1	CA2	CA3	CA4 (ATT)	CA5		
30	30	4	4	4	3	4		
60		Best of 5 (15)					75	150

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EC201L	Course Name: Computer Organization & Logic Design	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/ELCE		3	0	0	3

Pre-requisite: NA

Course Objectives:

1. Explore the basics of digital logic, including number systems and logic gates.
2. Perform the analysis and design of various digital electronic circuits.
3. Explore the knowledge of Computer organization and memory concepts.
4. Work in a team to demonstrate an application of digital circuits by engaging in self-learning.

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

1. Apply the basics of binary arithmetic and codes in digital system design.
2. Design combinational logic circuits using Boolean functions and gate-level minimization
3. Design sequential logic circuits, including latches, flip-flops, registers, and counters.
4. Understand computer organization, including bus architecture, processor organization, and I/O systems.
5. Understand memory organization, cache, and virtual memory.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

CO4	3	3	2	2	2	2	-	-	-	-	-	-	-	-
CO5	3	3	2	2	1	1	-	-	-	-	-	-	2	-

Unit 1	**Digital Design and Binary Numbers**	**09 hours**
Binary Arithmetic, Negative Numbers and their Arithmetic, Floating point representation, Binary Codes, Cyclic Codes. Multiplication: Signed operand multiplication, Booth's algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation, IEEE Standard for Floating Point Numbers		
Unit 2	**Combinational Logic Circuits**	**09 hours**
Minterm and Maxterm, Boolean Algebra, Realization of Boolean Functions, SOP and POS simplification, Gate-level minimization: The K-map method up to four variables, don't care conditions, Quin-McClusky Method. NAND and NOR implementation. Binary Adder-Subtractor, Look ahead carries adders Code Converters, Parity Generators and Checkers, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Arithmetic & logic unit design.		
Unit 3	**Sequential Logic Circuits**	**10 hours**
Sequential Circuits, Storage Elements: Latches, Flip Flops, Analysis of Clocked Sequential circuits, state reduction and assignments, design procedure. Registers and Counters: Shift Registers, Ripple Counter, Synchronous Counter, Other Counters.		
Unit 4	**Basics Of Computer Organization And Input/Output**	**09 hours**
Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer. Processor organization, general registers organization, stack organization and addressing modes. Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors.		
Unit 5	**Memory**	**08 hours**
Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories. Cache memories: concept and design issues & performance, address mapping and replacement, Virtual memory: concept implementation		
	Total Lecture Hours	**45 hours**

Textbook:

1. Anand Kumar, Fundamentals of Digital Circuits", PHI, 4th, 2016.
2. M Morris Mano, Digital Logic and Computer Design", Pearson, 6th, 2020.
3. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Naraig Manjikian, "Computer Organization and Embedded Systems", Tata McGraw Hill, 6th, 2012.

Reference Books:

1. M Morris Mano, "Digital Design: With an Introduction to the Verilog HDL and System Verilog", Pearson, 6th, 2018.
2. Charles H Roth and Larry L Kinney, "Analog and Digital Electronics", Cengage Learning, 2019.
3. Volnei A. Pedroni, "Circuit Design with VHDL", MIT Press, 3rd, 2020.
4. Brown S. and Zvonko Vranesic, "Fundamental of Logic with Verilog Design", Tata McGraw Hill, 1st, 2003.
5. William Stallings, "Computer Organization and Architecture", Pearson, 11th, 2018.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1 30	MSE2 30	CA1 4	CA2 4	CA3 4	CA4 (ATT) 3	CA5 4		
60		Best of 5 (15)					75	150

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EE101B	**Course Name: IoT and Embedded Systems**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**2**	**0**	**0**	**2**

Pre-requisite: NA

Course Objectives:

1. The course aims to provide exposure to the applications of IoT in smart cities and industrial applications.
2. It aims to train the students to the basic concepts of the Embedded C.
3. It aims to train the students to the basic concepts of the Controller.
4. This course is designed to give the students hands-on experience with the Software and Hardware concepts.

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

1. Understand the basic concepts of sensors and transducers.
2. Understand basics of embedded system and different IoT boards.
3. Apply basic operations and programming techniques of IoT devices.
4. Apply smart technology knowledge through case studies.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	**Sensing Devices & Transducers**	**08 hours**

Sensors & Transducer: Definition, Types & selection criterion of sensors, Classification of Sensors & Transducer based on principle of operation, Fundamentals & Applications of Potentiometer, Fundamentals & Applications of strain gauge.

Unit 2	**Embedded Systems Fundamentals**	**06 hours**

Introduction to Embedded C: Interfacing Basics, Digital I/O, Analog I/O, Differences between standard C and Embedded C, Introduction to Arduino (ATmega328P), Arduino board components and architecture, Introduction to Raspberry Pi 5, Understanding GPIO pins and their modes, Interfacing DHT11 with Arduino.

Unit 3	**IoT Board**	**8 hours**

Introduction to IoT in Modern Industry Applications, Basic Operations of IoT, Basics of ESP 8266 programming, Introduction to Blynk IoT, Interfacing with Different types of Sensors: Touch Sensor, Alcohol Sensor (MQ 3), LPG Sensor (MQ 6), Relay, Light Dependent Resistor (LDR), IR (Infrared) Sensors and PIR (Passive Infrared) Sensors.

Unit 4	**Smart Sensor Technologies**	**08 hours**

Intelligent Sensors: General Structure of smart sensors & its components, Case study of Air Quality Monitoring System, Case study of Soil Health Monitoring System, Case study of Water Quality Monitoring System.

	Total Lecture Hours	**30 hours**

Textbook:

1. Raj Kamal, "Internet of Things: Architecture and Design Principles", McGraw Hill Education (India) Private Limited CHENNAI.
2. Waldemar Nawrocki , "Measurement Systems and Sensors" , Artech House Boston , London.
3. K. Krishnaswamy and S. Vijayachitra ,"Industrial Instrumentation", New Age International Publishers.
4. D. Patranabis, "Sensors and Transducers" , PHI Learning Pvt. Ltd. Delhi.

Reference Books:

1. Murty D.V.S, “TRANSDUCERS AND INSTRUMENTATION”, 2ND EDN, PHI.
2. Rajkumar Buyya and Amir Vahid Dastjerdi , "Internet of Things: Key Applications and Protocols" Elsevier.
3. "Internet of Things: A Hands - on approach" by Arsheep Bahga and Vijay Madisetti., Orient Blackswan Private Limited - New Delhi 2.
4. Pethuru Raj and Anupama C. Raman. “The Internet of Things: Enabling technologies, platforms, and use cases”. Auerbach Publications.
5. "The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and Beagle Bone Black" by Donald Norris, McGraw-Hill Education TAB.

Mode of Evaluation (Reference: Annexure-1)

MSE		CA					ESE	Total	
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3			
40		Best of 5 (10)					50	100	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: ME101B	Course Name: Design & Realization	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/ECE/EEE/ELCE/ME		2	0	0	2

Pre-requisite: NA

Course Objectives:

1. To familiarize students with the modern technologies used in industries.
2. To realize the fundamentals of Computer Aided Design & digital manufacturing.

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

1. Understand the concept of Computer-Aided Design (CAD).
2. Apply CAD software to create basic 3D models.
3. Apply CAD and Additive Manufacturing software for 3D printing.
4. Understand the fundamentals of Computer-Aided Manufacturing and CNC machining.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Computer-aided Design	12 hours

First and third angle projection. Orthographic Projection: projection of point, Projection of solids, Principles of isometric projection isometric scale –Isometric projections of simple solid with AutoCAD 3D interface. Morphology of Design, mapping of design phase with CAD functions, product cycle computer-aided design.

Unit 2	CAD for 3D Printing	06 hours

CAD Modelling for 3D printing: Introduction to 3D printing, 3D Scanning, and digitization, AM Software: data formats, Creating STL file, Advantages and limitations of STL file format; slicing: -uniform flat layer slicing, adaptive slicing, Process-path generation: rasterization, part Orientation, and support generation.

Unit 3	3D Printing	06 hours

Liquid-based 3D Printing: Photo Polymerization - Principle and working of stereolithography apparatus (SLA) based 3D printing process; Applications; Post Processing, Solid ground curing (SGC). Solid state 3D Printing: Basic Principle and working of Fused deposition modelling (FDM) process and laminated object manufacturing (LOM) process; Post Processing, Applications. Powder-based 3D printing: Principle and working of Selective Laser Sintering (SLS) process; Applications; Post Processing.

Unit 4	Computer Aided Manufacturing	06 hours

Introduction to CNC Machining, Advantages and limitations of CNC machining, Types of CNC machines, Components of a CNC machine (e.g. controller, spindle, axes, ATC), CNC machine configurations (e.g., 3-axis, 5-axis). CNC Programming Basics: Introduction to G-code and M-code programming & its basic applications.

Total Lecture Hours	30 hours

Textbook:

1. Engineering Graphics & Design, P. S. Gill.
2. Computer-Aided Graphics and Design, Daniel L. Ryan
3. Computer-Aided Design and Manufacturing by M. Groover

Reference Books:

1. Engineering Graphics With AUTOCAD, Kulkarni D.M
2. An Introduction to 3D Printing by Victoria Zukas and Jonas A. Zukas
3. Computer Aided Manufacturing, P.N. Rao, N.K. Tewari, T.K. Kundra

Mode of Evaluation

MSE		CA					ESE	Total	
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3			
40		Best of 5 (10)					50	100	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: AI101B	Course Name: Introduction to AI	L	T	P	C
Course Offered in: CSE(AI)/CSE(AIML)		2	0	2	3

Pre-requisite: NA

Course Objectives:

The objective of this course is to provide students with a solid understanding of AI principles and applications, gain insights into robotics, computer vision and natural language processing, explore ethical considerations, and acquire hands-on skills in implementing AI solutions for real-world scenarios.

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

1. Acquire the basic understanding of the fundamental concepts of artificial intelligence (AI) to implement search algorithms, and game playing strategies.
2. Develop the insights of data pre-processing techniques and its visualization.
3. Gain a basic understanding of Machine Learning, NLP and computer vision to solve real-world problems.
4. Apply concepts of uncertainty in AI, decision-making frameworks, and reinforcement learning techniques to solve real-world problems.
5. Understand the fundamentals of ANN, Generative AI, ChatGPT, and AI ethics while exploring the future potential of AI applications.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Introduction to AI	08 hours

Discussion on Course outcomes and Introduction to AI, Motivation and role of Artificial Intelligence, AI from Turing Test to Humanoids , Various approaches to AI, AI concept , terminology and application area, Agents and Environments, Types of AI: Search Based System, Rule Based system, Learning Based System, Adversarial search and Games: Optimal Decisions in games, min-max algorithm, alpha-beta pruning, Constraint satisfaction problem: Constraint Propagation, Backtracking search, local search.

Unit 2	Understanding Data	07 hours

History Of Data, Data Storage And Importance of Data and its Acquisition, The Stages of data processing, Data visualization

Unit 3	Domains of AI	08 hours

Overview of ML: Supervised Learning, Unsupervised Learning, Overview of NLP : Speech recognition , Natural language understanding, Natural language generation, Machine Translation , Overview of Computer vision: image formation, image classification, image detection, Overview of ANN

Unit 4	Uncertainty In AI And its Emerging Technologies	07 hours

Uncertainty in AI: conditional independence, Baye's rule, naive baye's model, Simple decision: utility function, decision network, Reinforcement learning: Active learning, Passive learning, Model Based Learning. Emerging Technologies: Generative Adversarial Networks, Chatbot, Generative AI: Overview-ChatGPT, Ethics of AI, future of AI.

List Of Practical's (Indicative & Not Limited To) — **30 hours**

1. n-Queens problem using Local Search.
2. n-Queens problem using Constraint Satisfaction.
3. Customer Segmentation data visualization
4. Data Augmentation Image annotation
5. Data Pre-processing
6. Image Classification and Dataset Creation
7. Implementation of Decision Tree
8. Implementation of K-means.
9. Implementation of Neive Bays
10. Chatbot

Total Lecture Hours — **60 hours**

Textbook:

1. NORVIG, P. R. (2021). Artificial intelligence: A modern approach, 4th edition, Pearson

Reference Books:

1. Rajendra Aketkar, "Introduction to Artificial Intelligence" (E-book)

Mode of Evaluation

MSE		CA					ESE	Total	
MSE1 30	MSE2 30	CA1 4	CA2 4	CA3 4	CA4 (ATT) 3	CA5 4			
60		Best of 5 (15)					75	150	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EC202L	Course Name: Intelligent Health Care System	L	T	P	C
Course Offered in: ECE		1	0	0	1

Pre-requisite: NA

Course Objectives:

1. Explore Fundamentals of Health Care and the Role of Intelligent Systems in Health Care System.
2. Realize Health Care Technologies with Emerging Trends and Innovations

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

1. Apply the Fundamentals of Health Care Systems.
2. Explore the Role of Intelligent Systems in Health Care.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	1	-	1	-	-	-	1		3
CO2	3	3	2	2	1	1	-	1	-	-	-	1		3

Unit 1	Introduction to Intelligent Health Care Systems	10 hours

Cell and its structure – Resting and Action Potential – Nervous system and its fundamentals - Basic components of a biomedical system- Cardiovascular systems- Respiratory systems -Kidney and blood flow - Biomechanics of bone -Biomechanics of soft tissues - Basic mechanics of spinal column and limbs -Physiological signals and transducers -Transducers – selection criteria – Piezo electric, ultrasonic transducers - Temperature measurements - Fiber optic temperature sensors.

Unit 2	Biomedical Devices and Future Trends	05 hours

Biomedical Devices and Future Trends: Demonstration and working mechanism of Biomedical device: Patient Monitor while covering essential physiology parameters such as ECG, BP, Heart Rate etc. Future Trends and Innovations: Emerging technologies in intelligent healthcare systems, Research directions and future possibilities.

Total Lecture Hours	15 hours

Textbook:

1. Leslie Cromwell, Biomedical Instrumentation and Measurement, Prentice Hall of India, New Delhi,2007.
2. M. Arumugam, 'Bio-Medical Instrumentation', Anuradha Agencies, 2003.
3. Khandpur R.S, Handbook of Biomedical Instrumentation, , Tata McGraw-Hill, New Delhi, 2 Edition, 2003.

Reference Books:

1. John G. Webster, Medical Instrumentation Application and Design, John Wiley and sons, NewYork, 1998.
2. Duane Knudson, Fundamentals of Biomechanics, Springer, 2nd Edition, 2007.
3. Suh, Sang, Gurupur, Varadraj P., Tanik, Murat M., Health Care Systems, Technology and Techniques, Springer, 1st Edition, 2011.
4. Ed. Joseph D. Bronzino, The Biomedical Engineering Hand Book, Third Edition, Boca Raton, CRC Press LLC, 2006.
5. Joseph J.carr and John M. Brown, Introduction to Biomedical Equipment Technology, John Wiley and sons, New York, 4th Edition, 2012.

Mode of Evaluation

MSE		CA					ESE	Total	
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3			
40		Best of 5 (10)					-	50	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EE102L	Course Name: Explorations in Electrical Engineering	L	T	P	C
Course Offered in: ECE/EEE/ELCE/ME		2	0	0	2

Pre-requisite: NA

Course Objectives:

1. Implement different circuits and verify circuit concepts for DC and AC circuits.
2. Prove the various theorems used to reduce the complexity of electrical network.
3. The operation and characteristics of AC machines and DC machines.

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

1. Understand the concepts of electric circuit solutions with DC supply using mesh-nodal analysis and Network Theorems.
2. Apply the concepts of electrical circuits with AC supply in single and three phase system
3. Analyze the equivalent circuit and performance of single-phase AC transformer
4. Illustrate the working principle of induction motors, synchronous machines and DC machines.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	DC Circuits	10 hours

Electrical circuit elements (R, L and C), Concept of active and passive elements, voltage and current sources, concept of linearity and linear network, unilateral and bilateral elements, Kirchhoff's laws, Loop and nodal methods of analysis, Superposition theorem and Thevenin's theorem.

Unit 2	AC Circuits	05 hours

Representation of Sinusoidal waveforms – Average and effective values, Form factor and peak factor, Concept of phasors, phasor representation of sinusoidal varying voltage and current. Analysis of single-phase AC Circuits consisting of R, L, C, RL, RC, RLC combinations (Series and Parallel), Apparent, active & reactive power and Power factor. Introduction to 3-phase AC Circuits.

Unit 3	Magnetic Circuit and Transformer	07 hours

Magnetic circuits and calculation related to simple magnetic circuits, Working principle of Transformer, EMF equation of transformer, Ideal and practical transformer, losses in transformers, Efficiency of Transformer. Introduction to Auto Transformer.

Unit 4	Introduction to Electrical Machines	07 hours

Introduction to DC Machines, Types of DC Machines, Working principle of three phase Induction Motor and concept of slip, Toque- slip characteristics, Different starting methods of 1-phase induction motor. Working principle of Synchronous motor.

Total Lecture Hours	30 hours

Textbook:

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. Hughes, E., Smith, I.M., Hiley, J. and Brown, K., "Electrical and Electronic Technology", PHI (2008)
3. P.V. Prasad, S. Sivanagaraju, "Electrical Engineering: Concepts and Applications" Cengage, 2018.

Reference Books:

1. E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.
2. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
3. V. D. Toro, "Electrical Engineering Fundamentals", Pearson India, 2018.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3		
40		Best of 5 (10)					50	100

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: ID103B	Course Name: Design Thinking	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		1	0	0	1

Pre-requisite: NA

Course Objectives:

1. To expose the student with state of the art perspectives, ideas, concepts, and solutions related to the design and execution of projects using design thinking principles.
2. To prepare the mindset and discipline of systemic inspiration driven by a desire to identify new sources of ideas, and new models especially outside their regular working atmosphere.
3. To propose a concrete, feasible, viable and relevant innovation project/challenge.

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

1. Understand the basic requirements of a good design.
2. Empathize and ideate the solutions to problems in his environment
3. Prototype and test the developed solutions.
4. Apply the principles of design thinking on developing innovative solutions to the real world problems.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Fundamentals Of Design Thinking	04 hours

Concept of Design Thinking, Need of Design Thinking, Goal of Design thinking (Desirability, feasibility and viability), Design thinking Process model, Design thinking tools.

Activities: Identify an Opportunity, Scope of the Project, Explore the possibilities and prepare a design brief.

Unit 2	Empathize And Define	03 hours

Design thinking phases, how to empathize, Role of empathy in design thinking, the purpose of empathy maps, Things to be done prior to empathy mapping, Activities during and after the session, Understanding empathy tools: Customer Journey Map, Personas. Define- Methods of Define Phase: Storytelling.

Activities: Apply the methods of empathizing and Define Phases Finalize the problem statement.

Unit 3	Ideation	04 hours

Challenges in idea generation, Visualize, Empathize, and Ideate method, Importance of visualizing and empathizing before ideating, Applying the method, Create Thinking, Generating Design Ideas, Lateral Thinking, Analogies, Brainstorming, Mind mapping, Ideation Tools: How Might We? (HMW), Storyboard, Brainstorming. What is design innovation? A mindset for innovation, and asking, "What if?" asking "What wows?" and "What works?"

Activities: Apply the methods of Ideate Phase: Generate Innovative solution ideas.

Unit 4	Prototyping And Testing	04 hours

What is a prototype? - Prototyping as a mindset, prototype examples, prototyping for products; Why we prototype? Fidelity for prototypes, Process of prototyping- Minimum Viable prototype. Testing prototypes with users, Collect feedback; iterate and improve the ideas.

Activities:

1. Prototype: Apply the Methods of the Prototype Phase - Create prototypes for selected ideas.
2. Testing: Collect feedback; iterate and improve the ideas Present your solution using the Storytelling method.

Total Lecture Hours	15 hours

Textbook:

1. Design Thinking, A Beginner's Perspective, E Balaguruswamy, Bindu Vijayakumar, Mc Graw Hill,2024
2. The Design Thinking Playbook, Michael Lewrick (Author), Patrick Link (Author), Larry Leifer (Author) Publisher Wiley, Edition 2018.
3. Design Thinking For Dummies, Prof. Dr. Christian Müller- Roterberg, Wiley, 2021

4. The Design of Everyday Things, Don Norman(Author), Navol Books Trading, Edition 2022.

Reference Books:

1. Designing Experiences, James Robert Rossman and Mathew D. Duerden, Columbia Business School Pub, Edition 2019.
2. Roger Martin, "The Design of Business: Why Design Thinking is the Next Competitive Advantage", Harvard Business Press, Edition 2009.
3. Idris Mootee, Design Thinking for Strategic Innovation,2013, John Wiley & Sons Inc.

Mode of Evaluation

MSE	CA					ESE	Total	
40	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3			
40	Best of 5 (10)					-	50	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: MA103L	Course Name: Linear Algebra for Engineers	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE		3	1	0	4

Pre-requisite: NA

Course Objectives:

1. The objective of this course is to develop a strong foundation in linear algebra and to impart the knowledge of tools from intermediate to advanced level of mathematics.
2. Students will be equipped with the necessary skills to apply linear algebra to solve complex engineering problems.
3. They will able to continue their studies in advanced topics within the field.

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

1. Apply elementary transformation to solve system of Linear equations.
2. Employ the matrix factorization and in data decomposition.
3. Understand the concept of vector space and subspaces.
4. Explore the concept of linear transformations to apply in engineering applications.
5. Explore the concept of inner products of vectors to decide orthogonality and orthonormality

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Matrix Algebra	09 hours

Introduction to Real and Complex Matrices, Elementary Transformation, Rank of a Matrix by Echelon Form, Solution of system of Linear Equations by direct method (Gauss Elimination Method), Solution of system of Linear Equations by Iterative method (Gauss Siedal Method), Linear dependence and independence of vectors.

Unit 2	Applied Matrix Algebra	09 hours

Matrix factorization, LU Decomposition, Eigen Values & Eigen Vectors, diagonalization of matrix of order two, Eigen Value Decomposition and singular value decomposition.

Unit 3	Vector Spaces	09 hours

Introduction to Vector Spaces, Basic Properties of Vector Spaces, Sub spaces, Basis and dimension, Introduction of finite and Infinite Dimensional Spaces.

Unit 4	Linear Transformation	09 hours

Introduction to linear transformation, Matrix representation of Linear Transformation, Equivalent matrix and Similarity transformation, Rank and Nullity, Rank-Nullity Theorem (without proof), Kernel and Range. Application of Linear Transformation in image Magnification.

Unit 5	Inner Product Space	09 hours

Introduction to inner product and norm of vectors, Orthogonality, Orthonormality, Gram-Schmidt Method, Orthonormal basis, projections using inner products; orthogonal transformations and rotations.

Total Lecture Hours	**45 hours**

Textbook:

1. Hoffman, K. and Kunze, R., "Linear Algebra", Pearson Education (Asia) Pvt. Ltd/ Prentice Hall of India, 2015
2. Nair, M.T. & Singh A., Linear Algebra, Springer, 2019.
3. Strang, Gilbert, Linear Algebra and its Application, Cengage Learning, 4th edition, 2005.
4. Jain, M.K., Iyengar, S.R.K. and Jain R.K., Numerical Methods, New Age International Publishers, 2019

Reference Books:

1. Schaum's Outline of Linear Algebra, McGraw Hill Education 2017
2. Strang, G., "Linear Algebra and Its Applications", Thomson Learning Asia Pvt. Ltd.4th edition ,2005.
3. Lay, Dand C., "Linear Algebra and Its Applications" Pearson Education Limited, 6th edition 2020.
4. Richard, L. Burden, J. Douglas Faires, and Annette Burden, Numerical Analysis, Cengage Learning, 10th edition, 2015.
5. Sastry S. S. "Introductory Methods of Numerical Analysis", PHI, 3rd edition 2002.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1	MSE2	CA1	CA2	CA3	CA4	CA5		
30	30	5	5	5	(ATT) 5	5		
80		Best of 5 (20)					100	200

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: MA104L	Course Name: Differential Equations & Complex Integration	L	T	P	C
Course Offered in: ME		**3**	**1**	**0**	**4**

Pre-requisite: NA

Course Objectives:

1. The objective of this course is to learn the techniques for solving ordinary and partial differential equations related to physical phenomena such as heat conduction, wave propagation.
2. Equipping the skills of transformation and series helps to analyze system behavior and describe physical phenomena to both theoretical and practical problems in various fields.

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

1. Apply the knowledge to solve ordinary and higher order differential equation use in Engineering problem
2. Apply the concept of periodic function to find Fourier series and Fourier half range series.
3. Employ the concept of Partial Differential Equations in heat equation, wave equation and Laplace equation with different types of boundary conditions.
4. Apply the concept of Laplace transforms techniques to solve ordinary differential equations.
5. Apply the knowledge of complex integration to solve integrals and expansion of function using Laurent and Taylor series

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Ordinary Differential Equation of Higher Order	09 hours

Linear differential equation of n^{th} order with constant coefficients, Cauchy-Euler equation, solution of second order linear differential equations by the method of variation of parameters.

Unit 2	Fourier Series	09 hours

Periodic function, even and odd function, Fourier series expansion of a function in the interval c to c+2l.
Half Range Series: Half range sine and cosine series in the interval -l to l

Unit 3	Partial Differential Equation	09 hours

Introduction to partial differential equation, initial and boundary value problems, solution of partial differential equation by

the method of separation of variables, solution of one-dimensional heat and wave equations and Laplace equation.		
Unit 4	**Laplace Transform**	**09 hours**
Laplace Transform of some standard functions, I and II Shifting theorems (without proof), Change of Scale Property, Laplace transform of derivatives and integrals, Inverse Laplace Transform, Convolution theorem (without proof), Application of Laplace transform to ordinary differential equation.		
Unit 5	**Complex Variable –Integration**	**09 hours**
Complex integrals, Cauchy-Goursat theorem (without proof), Cauchy integral formula (without proof), Taylor's series (without proof), Laurent's series (without proof), Singularities, Classification of Singularities, zeros of analytic functions.		
	Total Lecture Hours	**45 hours**

Textbook:

1. BS Grewal, Higher Engineering Mathematics, Khanna Publishers.
2. B. V. Ramana, Higher Engineering Mathematics, McGraw-Hill Publishing Company Ltd., 2008.
3. R K. Jain & S R K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House 2002.
4. N. P Bali, Engineering Mathematics 4 PDE & Statistics.
5. M. D. Raisinghania: Ordinary and Partial Differential Equations (S. Chand).

Reference Books:

1. Peter V. O'Neil, Advance Engineering Mathematics Thomson (Cengage) Learning, 2007.
2. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya, 1996.
3. Sheply L. Rose: Differential Equations (Wiley India).

Mode of Evaluation

MSE		CA					ESE	Total
MSE1 30	MSE2 30	CA1 5	CA2 5	CA3 5	CA4 (ATT) 5	CA5 5		
80		Best of 5 (20)					100	200

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: CS201B	**Course Name: Data Structure**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**3**	**0**	**2**	**4**

Pre-requisite: The course requires background in mathematics and sufficient programming skills.

Course Objectives:

1. To provide a deep understanding of fundamental data structures and their applications.
2. To provide expertise in the efficient implementation of physical and logical data structures.
3. To provide insight into the working of searching and sorting algorithms.
4. To develop the analytical ability for solving real-world problems using the data structure.

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

1. Use the concept of the array in searching and sorting algorithms.
2. Illustrate the concept of Dynamic Memory Allocation for operations on linked list.
3. Analyze different recursion techniques using stack.
4. Implement queue and its applications using basic data structure.
5. Apply the knowledge of tree and binary search tree structures for problem solving.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	**Introduction**	**10 hours**

Basic Terminology, Types and application of Data Structures, Algorithm, Efficiency of an algorithm, Time space trade off and complexity, asymptotic notation. Array: Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Derivation of Index Formulae for 1-D,2-D,3-D and n-D Array Application of arrays, Sparse Matrices, and

their representations, arithmetic operations on matrices. Searching: Linear search, Binary Search, Indexed Sequential search Sorting: Insertion Sort, Bubble sort, Selection sort, Quick Sort, Merge Sort, Merge Sort.
Application Area: Matrix, Dynamic Programming, Redix Sort, Bucket Sort Buffer or Cache, Stack & Queue, Graph Representation, Tree, Image Processing, Signal Processing, Databases, Web Search Engines, Networking Routing

Unit 2	**Linked Lists**	**09 hours**

Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Reversing, Polynomial Representation and Addition. Generalized Liked list.
Application Area: Symbol table implementation, Memory Management, Tries, Tree, Graph, Music and Video Playlists, Undo/Redo Functionality, Hash Tables and Collision Resolution

Unit 3	**Stack**	**08 hours**

Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked List Implementation of Stack, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Tail recursion, Head Recursion, Nested recursion, Removal of recursion. Problem solving using iteration and recursion with examples such as Fibonacci numbers, and Hanoi towers. Trade-offs between iteration and recursion.
Application Area: Function Call Stack, Optimal Parentheses Problem in Matrix multiplications, Backtracking, Depth-First Search, Parsing and Compiler Design, Process Control Block, Memory Management.

Unit 4	**Queue**	**08 hours**

Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues, Double Ended queue, and Priority Queue.
Application Area: Job Scheduling, Breadth-First Search, Search Trees and Binary Search Tree, Database Operations, Customer Service, Web Server Request Handling, Buffering and Data Streaming, Traffic Management.

Unit 5	**Trees**	**10 hours**

Binary Tree and Its array and linked list representation, Strict Binary Tree, Complete Binary Tree, Tree Traversal algorithms: In- order, Pre-order and post-order, level order, Constructing Binary Tree from given Tree Traversal, BST Operation: Searching, Insertion, Deletion, Threaded Binary Trees, Traversals in Threaded Binary Trees, Heaps, Heap Sort
Application Area- Dictionary Implementation, Compiler Design, Graph Algorithms, In order Traversal Optimization

List Of Practical's (Indicative & Not Limited To) **30 hours**

1. Write a program to find the sum of elements of positive and negative elements of a one- dimensional array.
2. Given an integer array nums, write a program to print true if any value appears at least twice in the array, and return false if every element is distinct.
3. Given a sorted array of distinct integers and a target value, write a program to print the index if the target is found. If not, return the index where it would be if it were inserted in order.
4. Nirobi has given a matrix C of size N x M to Rio. Also, Rio is given the position of submatrix as X1, Y1, and X2, Y2 inside the matrix. Now Rio needs to find the sum of all elements inside that submatrix. Can you help Rio in completing the task assigned by Nirobi?
5. You are given the pointer to the head node of a linked list and an integer to add to the list. Create a new node with the given integer. Insert this node at the tail of the linked list and return the head node of the linked list formed after inserting this new node. The given head pointer may be null, meaning that the initial list is empty.
6. Given head, the head of a linked list, write a program to print to determine if the linked list has a cycle in it or not.
7. You have three stacks of cylinders where each cylinder has the same diameter, but they may vary in height. You can change the height of a stack by removing and discarding its topmost cylinder any number of times.
8. Find the maximum possible height of the stacks such that all of the stacks are exactly the same height. This means you must remove zero or more cylinders from the top of zero or more of the three stacks until they are all the same height, then return the height.
9. Implement a last-in-first-out (LIFO) stack using only two queues.
10. Write a program to search a key string in the given array of strings using binary search.
11. Write a program to sort the given elements using insertion sort technique.
12. Given the root of a binary tree, write a program to print the preorder traversal of its nodes' values.
13. Given a root node reference of a BST and a key, write a program to delete the node with the given key in the BST and return the root node reference (possibly updated) of the BST.
14. Given the root of a binary tree, write a program to check whether it is a mirror of itself (i.e., symmetric around its centre).
15. Given a rooted binary tree, write a program to print the sum of all left leaves. A leaf is a node with no

children. A left leaf is a leaf that is the left child of another node.
Total Lecture Hours **75 hours**
Textbook: 1. Horowitz, E., Sartaj Sahni, & Anderson-Freed, S. (2008). Fundamentals of data structures in C. University Press. 2. Lipschutz, S. (2014). Data structures. Mcgraw Hill Education (India) Private Limited. 3. Deshpande, P. S., & Kakde, O. G. (2009). C and data structures. Dreamtech Press. 4. Aaron M. Tenenbaum, Langsam, Y., & Augenstein, M. (2003). Data Structures Using C.
Reference Books: 1. Aho, A. V., Hopcroft, J. E., & Ullman, J. D. (2009). Data Structures and algorithms. Dorling Kindersly. 2. Kruse. (n.d.). Data Structures and Program Design in C. Pearson Education India. 3. Kernighan, B. W., & Ritchie, D. M. (2015). The C programming language. Pearson. 4. Van, P. (1994). Expert C programming: deep C secrets. Sunsoft Press. 5. Deitel, P., & Deitel, H. (2016). C How to Program, Global Edition. Pearson Higher Ed.
Mode of Evaluation

MSE		CA					ESE	Total
MSE1 40	MSE2 40	CA1 5	CA2 5	CA3 5	CA4 (ATT) 5	CA5 5		
80		Best of 5 (20)					100	200

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EE103L	**Course Name: Emerging Technologies for Engineers**	**L**	**T**	**P**	**C**
Course Offered in: EEE/ME		**2**	**0**	**0**	**2**

Pre-requisite: NA

Course Objectives:

1. To learn the basic concepts of cloud computing and its underlying technologies with its implementation.
2. To learn the basic concepts of Blockchain and its underlying technologies with its implementation.

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

1. Understand the concepts of Industry 1.0 to Industry 5.0 & 5G technology.
2. Apply the MATLAB for Engineering Applications
3. Understand the concepts of cloud computing
4. Understand the concepts of block chain.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	**Evolution of Industrial Revolutions**	**08 hours**
Evolution of industrial revolutions: From Industry 1.0 to Industry 5.0**.** Definition and components of Industry 5.0. Introduction to **IoT** and its role in Industry 5.0. Role of 5G technology in enabling new applications.		
Unit 2	**MATLAB for Engineering Applications**	**08 hours**
Importance of MATLAB in Engineering. MATLAB Programming basics, arrays, and functions. Matrix operations, plotting, and visualization tools. MATLAB Simulink basics for system modelling and simulation. Interfacing MATLAB with hardware (Arduino and DAQ).		
Unit 3	**Cloud Computing**	**08 hours**
Definition and characteristics of cloud computing. Evolution of cloud computing: From grid computing to utility computing. Cloud architecture and key components. Overview of AWS architecture and services. Overview of GCP architecture and services.		
Unit 4	**Blockchain**	**06 hours**

Introduction to Blockchain. Fundamentals, Principles and Technologies, Cryptocurrencies, Smart Contracts, Blockchain Applications.	
Total Lecture Hours	**30 hours**

Textbook:

1. Mastering Cloud Computing: Foundations and Applications Programming Book by Christian Vecchiola, Rajkumar Buyya, and S. Thamarai Selvi
2. Cloud Computing – Concepts, Technology and Architecture Pearson Thomas Erl

Reference Books:

1. Cloud Computing Master the Concepts, Architecture and Applications with Real- world examples and Case Studies by Ruchi Doshi, Temitayo Fagbola, Mehul Mahrishi.
2. Block Chain: Blueprint for a New Economy, O'Reilly, Melanie Swan
3. Blockchain Basics: A Non-Technical Introduction in 25 Steps by: Daniel Drescher.

Mode of Evaluation

MSE		CA					ESE	Total
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3		
40		Best of 5 (10)					50	100

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: EE104L	Course Name: Digital Logic Design	L	T	P	C
Course Offered in: EEE		**2**	**0**	**0**	**2**

Pre-requisite: Introduction to Computers

Course Objectives:

1. To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
2. To implement simple logical operations using Minimization Techniques.
3. To design combinational logic circuits.
4. To design sequential logic circuits.

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

1. Understand various types of number systems and their conversions.
2. Simplify the Boolean expressions and apply the Boolean theorems through logical gates.
3. Design and implement variety of logical devices using combinational circuits concepts.
4. Analyze sequential circuits like Registers and Counters using flip-flops.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	Number System and Boolean Algebra	08 hours

Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes. Digital Logic Gates (AND,NAND,OR,NOR,EX-OR,EX-NOR), Properties of XOR Gates, Universal Gates, Basic Theorems and Properties, Switching Functions, Canonical and Standard Form.

Unit 2	Minimization Techniques	08 hours

Introduction, The minimization with theorems, The Karnaugh Map Method, Three, Four and Five variable K- Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Quine-McCluskey Method, Multilevel NAND/NOR realizations.

Unit 3	Combinational Circuits	07 hours

Design Procedure – Half Adder, Full Adder, Half Subtractor, Full Subtractor, Parallel Binary Adder, Parallel binary subtractor,

Binary Multiplier, Multiplexers/De-Multiplexers, decoder, Encoder, Code Converters, Magnitude Comparator. Classification of sequential circuits, The binary cell, The S-R-Latch Flip-Flop The D-Latch Flip-Flop, The "Clocked T" Flip-Flop, The "Clocked J-K" Flip-Flop, Design of a Clocked Flip-Flop, Timing and Triggering Consideration.		
Unit 4	**Sequential Circuits**	**07 hours**
Introduction, Basic Architectural Distinctions between Combinational and Sequential circuits, Latches, Flip-Flops, SR,JK,D,T and Master slave, characteristic Tables and equations, Conversion from one type of Flip-Flop to another, Counters - Design of Single Mode Counter, Ripple Counter, Ring Counter, Shift Register, Ring counter using Shift Register.		
	Total Lecture Hours	**30 hours**

Textbook:

1. Digital Logic and Computer Design by M. Moris Mano, 4th Edition.
2. Digital Principles and Applications by Leach, Paul Malvino, 5th Edition.

Reference Books:

1. Fundamentals of Digital Logic Design by Charles H.Roth, Jr. 5th Edition, Cengage
2. Digital Electronics by G.K. Kharate, Oxford University Press
3. Switching Theory and Logic Design by A. Anand Kumar, PHI, 2nd Edition

Mode of Evaluation

MSE		CA					ESE	Total
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3		
40		Best of 5 (10)					50	100

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

Course Code: ME102L	**Course Name: Engineering Mechanics**	**L**	**T**	**P**	**C**
Course Offered in: ME		**2**	**0**	**0**	**2**

Pre-requisite: NA

Course Objectives:

1. To learn the application of principles of mechanics.
2. To learn the concept of centroid and moment of an area.
3. Familiarization of the concept of motion of particles and rigid bodies.

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

1. Understand shear forces and bending moments for different beam configurations and loading conditions.
2. Analyze truss structures using the methods of joints and sections and demonstrate a thorough understanding of friction types and laws.
3. Apply first principles and theorems to calculate centroids, centers of gravity and moments of inertia for area and masses.
4. Apply the principles of kinematics and kinetics of rigid bodies.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

Unit 1	**Introduction to Beams**	**08 hours**
Basic concepts, Shear Force and Bending Moment Diagram for Cantilever Beam, Simply Supported Beam and Overhanging Beam with Concentrated Load, Distributed Load and Couple, Relation Between Shear Force and Bending Moment, Case study on practical applications of different beams and its loadings.		
Unit 2	**Analysis of Structures**	**07 hours**
Types of truss and assumptions, Analysis of plane trusses by method of joints and method of section, Case study of truss applied to different type of structures. Friction - Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Impending motion of Bodies, Practical applications of friction in different machines.		
Unit 3	**Centroid and Centre of Gravity**	**07 hours**

Centroid from first principle, centroid of composite sections; Centre of Gravity from first principle, Centre of Gravity of composite sections. Moment of Inertia – Area moment of inertia, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of composite sections; Mass moment of inertia of circular plate, Cylinder, Cone, Sphere, Radius of Gyration. Case study on practical applications of CG and MI.		
Unit 4	**Kinematics of rigid body**	**08 hours**
Basic terms, Types of motion, plane motion of rigid body, velocity and acceleration under translational, rotational motion and general principles in dynamics; Instantaneous center of rotation in plane motion, relative velocity. Practical examples and real-life applications of concept. Kinetics of rigid body – D' Alembert's principle and its applications in plane motion and connected bodies; Impulse- Momentum principle, Work-energy principle and its application in plane motion of connected bodies; Kinetics of rigid body in rotation, Practical examples and real-life applications of concept.		
	Total Lecture Hours	**30 hours**

Textbook:

1. Engineering Mechanics by S S Bhavikatti, 7th Multi colour Edition.
2. Engineering Mechanics, R.K. Bansal, Laxmi Publications.
3. Engineering Mechanics, R.S. Khurmi, S.Chand Publishing.

Reference Books:

1. Meriam J.L. and Kraige L.G., Engineering Mechanics-Statics-Volume 1, Dynamics-Volume 2, Third Edition, John Wiley & Sons (1993).
2. Mechanics of Materials by James M. Gere and Barry J. Goodno
3. Structural Analysis by Russell C. Hibbeler
4. Mechanics of Materials by Ferdinand P. Beer, E. Russell Johnston Jr., John T. DeWolf, and David F. Mazurek

Mode of Evaluation

MSE		CA					ESE	Total	
MSE1 20	MSE2 20	CA1 2	CA2 2	CA3 3	CA4 (ATT) 3	CA5 3			
40		Best of 5 (10)					50	100	

CA5: Participation in any Hackathon, National/International Activity or Research Paper Publication outside only.

3. Practical's Courses Detail Syllabus

Course Code: PH101P	Course Name: Semiconductor Physics and Devices Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

To impart the technical aspect of semiconductor Physics and devices to engineering graduates so that they are able to assess and contribute to the solution of technical and engineering problems that are based on broad principles of Physics including solid state
physics, semiconductors, optoelectronics devices and Quantum Physics.

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

1. Illustrate the basic concept of crystalline materials and their appropriate use.
2. Apply the fundamentals of basic semiconductor Physics on transistor and MOSFET.
3. Apply the concepts of semiconductor Physics in aspect of solar cell and Zener diode.
4. Implementing of semiconductor Physics to study various characteristics of optoelectronic devices.
5. Apply the concept of Quantum Physics to study various phenomenon.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)
1. To study the Hall Effect and determine Hall coefficient, carrier density and mobility of a given semiconductor using Hall Effect set up. 2. Using solar cell Trainer (a) study voltage and current of a solar cell (b) Voltage and current in series and parallel combinations (c) Draw power curve to find maximum power point (MPP) and to obtain efficiency of a solar cell. 3. To determine the energy band gap of a given semiconductor material by four probe method. 4. To study the characteristics of NPN/PNP transistors. 5. To study the V-I characteristics of MOSFET. 6. To plot the graph of V-I characteristics of a Zener diode. 7. To determine the wavelength of Laser light using diffraction phenomena. 8. To find the fiber attenuation and numerical aperture of a given optical fibre. 9. To study the presence of discrete energy levels in an atom by Franck Hertz experiment. 10. To determine Planck's constant and work function using Photo-electric effect.
Total Lecture Hours: 15 hours

Mode of Evaluation

CA	ESE	Total
25	25	50

Course Code: EC201P	Course Name: Computer Organization & Logic Design Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/ELCE		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. Explore the basics of digital logic, including number systems and logic gates.
2. Perform the analysis and design of various digital electronic circuits.
3. Explore the knowledge of Computer organization and memory concepts.
4. Work in a team to demonstrate an application of digital circuits by engaging in self-learning.

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

1. Apply the basics of binary arithmetic and codes in digital system design.
2. Design combinational logic circuits using Boolean functions and gate-level minimization
3. Design sequential logic circuits, including latches, flip-flops, registers, and counters.
4. Understand computer organization, including bus architecture, processor organization, and I/O systems.
5. Understand memory organization, cache, and virtual memory.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. Investigate logic behaviour of AND, OR, NOT, NAND, EX-OR, EX NOR Gates. Realization of Boolean Expressions using Gates and minimization using Karnaugh Map.
2. Design and verification of the truth tables of Half, Full adder.
3. Design and verification of truth table of decoder and multiplexer circuits.
4. Design and implement 2- bit magnitude comparator.
5. Verification of truth tables of SR, J-K, and D Flip-Flops.
6. Design and verify all types of Shift Registers.
7. Design and verify the 2-Bit Synchronous and Asynchronous Counter.
8. Design memory units (single bit RAM cell) and understand how it operates during read and write operation.

Total Lecture Hours: 15 hrs.

Mode of Evaluation			
CA	ESE	Total	
25	25	50	

Course Code: IT101P	Course Name: Programming for Problem Solving Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	4	2

Pre-requisite: NA

Course Objectives:

1. Given a computational problem, identify and abstract the programming task involved.
2. Approach the programming tasks using techniques learned and write pseudo-code.
3. Choose the right data representation formats based on the requirements of the problem.
4. Use comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
5. By learning the basic programming constructs, students can easily switch over to any other language in future.

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

1. Apply programming constructs of C language to solve real-world problems.
2. Use the concepts of looping, branching, and decision-making statements for a given problem.
3. Develop Solutions to problems using modular programming constructs such as functions and recursion.
4. Demonstrate the ability to write C programs using pointers, strings structures and unions.
5. Design a solution to problems using the concepts of pointers and files handling.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1.
   a. Write a C program to input two integer numbers and perform addition, subtraction, division and multiplication.
   b. Accept any two numbers, if the first number is greater than the second then print the sum of these two numbers, otherwise print their difference. Write this program using the ternary operator.
   c. Write a program to accept the principal, rate, and number of years and find out the simple interest and compound interest.
   d. Write a C program to swap values of two variables with the help of a third variable and without using a third variable.
   e. Write a C program allows the user to input a floating-point number. The program then extracts an integral part of the number and finds its rightmost digit. By utilizing suitable algorithms and logic, the program accurately identifies the digit at the furthest right position in an integral part of the given number.
   f. Write a C program to add two numbers together without utilizing the conventional + operator. The program employs alternative techniques and logical operations to achieve the addition operation. By leveraging bitwise operations, such as bitwise XOR (^) and bitwise AND (&), along with bit shifting, the program cleverly performs the addition operation on each bit of the two numbers.
   g. Write a C program to determine whether a given year is a leap year or not using the conditional operator. The program takes advantage of the conditional (ternary) operator?:, which allows for concise conditional expressions. The leap year check is performed based on the following criteria: a year is a leap year if it is divisible by 4, but not divisible by 100 unless it is also divisible by 400.
   h. Write a C program to multiply two given numbers without using the * operator. The program takes advantage of the concept of repeated addition to perform multiplication. It prompts the user to input two numbers and utilizes a loop to iteratively add the first number to a running sum until the second number is reached.
   i. Write a C program to determine the largest among three given numbers using the conditional operator (?:).The program

prompts the user to input three numbers and utilizes the conditional operator to compare and determine the largest number among them.

2.

a. Write a menu-driven program using the Switch case to calculate the following:
   - Addition of two numbers
   - Difference between two numbers
   - Product of two numbers
   - Division of two numbers
   - HCF of two numbers
   - LCM of two numbers

b. Write a program to input an integer number and check whether it is prime or not.

c. Write a program to print prime numbers between 1 to 100.

d. Write a program to find reverse of a number and check whether it is palindrome or not.

e. Write a program to find the sum of the series given below:
   - $x - x^3/3! + x^5/5! - x^7/7! +$ ------- up to n terms.
   - $1 + (1+2) + (1+2+3) + (1+2+3+4) +$ ------- up to n terms.

f. Write a C program to check whether all the bits of a given number are unset or low. The program prompts the user to input a number and uses bitwise operators and logical operations to perform the check. The program utilizes the bitwise AND (&) operator with a bit mask that has all bits set to 0 except for the bit in the position being checked. By performing the bitwise AND operation between the number and the bit mask for each bit position, the program determines if the bit is unset or low.

g. Write a C program to read a list of integers using a loop and calculate the number of distinct prime factors for each integer in the list. The program prompts the user to input the number of integers they want to enter, followed by the actual integers. It then utilizes loops, conditional statements, and a prime factorization algorithm to determine the distinct prime factors for each integer.

h. Write a C program to address the scenario where a company decides to give bonuses to its employees on the occasion of the new year. The program allows the user to enter the salary and gender of each employee and calculate the bonus based on the specified criteria. It also displays the final salary that each employee will receive, taking into account the applicable bonuses To calculate the bonus, the program uses conditional statements based on the employee's gender and salary. If the employee is male, a 5% bonus is applied to the salary. If the employee is female, a 10% bonus is applied. Additionally, if the salary is less than 10000, an extra 2% bonus is given to the employee. The program applies these bonuses using appropriate calculations and stores the final salary in a variable.

i. Write a C program to print the following pattern:

```
        1
      1 2 3
    1 2 3 4 5
  1 2 3 4 5 6 7
1 2 3 4 5 6 7 8 9
  1 2 3 4 5 6 7
    1 2 3 4 5
      1 2 3
        1
```

j. The task at hand is to write a C program that displays a specific pattern. The pattern consists of a series of numbers arranged in a triangular shape. Each row of the pattern follows the ascending and descending order of numbers:

```
      1
    1 2 1
  1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
```

3.

a. The task at hand is to design a simple calculator program that will assist a doctor in examining the performance of a 13-year- old boy with exceptional mental math skills. The program will allow the doctor to input two numbers and choose an operation (addition, subtraction, multiplication, or division) to be performed on those numbers. The program will prompt the doctor to enter the two numbers and provide a menu of available operations. Based on the doctor's selection, the program will perform the chosen operation on the input numbers and display the result.

b. The task at hand is to design a program in C that converts a decimal number to its binary representation using a function.

The program will prompt the user to enter a decimal number, and then it will call the conversion function to convert the decimal number to binary. The conversion function will take the decimal number as input and perform the necessary calculations to generate its binary equivalent. It will employ mathematical operations, such as division and modulus, to extract the binary digits. The function will store the binary digits in an array or a string, representing the binary number. The program should handle various scenarios, such as positive decimal numbers, negative decimal numbers, and zero, while accurately converting them to binary. It should also handle any potential errors or limitations, such as exceeding the range of data types used for storing the decimal and binary numbers.

c. The task at hand is to design a program in C that counts the occurrence of each digit in a given number using recursion. The program will prompt the user to enter a number, and then it will call a recursive function to count the occurrence of each digit in that number.

d. Write a C program that multiplies two matrices using recursion. The program prompts the user to enter the dimensions and elements of two matrices. It then recursively computes the product of the two matrices and displays the resulting matrix. To perform matrix multiplication using recursion, the program defines a recursive function. This function takes the two matrices, their dimensions, and the current row and column indices as parameters. At each recursive call, the function multiplies the corresponding row of the first matrix with the corresponding column of the second matrix and calculates the sum of the products.

e. The task is to write a C program that calculates the sum of a series using a function. The series is defined as follows: x - (x^3 / 3!) + (x^5 / 5!) - (x^7 / 7!) + (x^9 / 9!) + ... (up to n terms)
Here, 'x' is a given input value, and 'n' represents the number of terms in the series. To solve this task, the program will define a function that takes 'x' and 'n' as parameters and returns the sum of the series. The function will use a loop to iterate through the terms of the series and calculate the value of each term based on the given formula. The sum of all the terms will be accumulated and returned as the final result. The program will also prompt the user to enter the values of 'x' and 'n', and then it will call the function to compute the sum of the series. Finally, the program will display the result to the user.

f. The program is designed to calculate and print a table of binomial coefficients using the provided formula. Binomial coefficients, denoted as B(m, x), are calculated using the formula B(m, x) = m! / (x! * (m - x)!), where m is the total number of elements, and x is the number of elements chosen at a time. The program prompts the user to enter the values of 'm' and 'x'. It then calculates the binomial coefficient for each combination of 'm' and 'x' that satisfies the condition m > x. The factorial function is used to calculate the factorials involved in the formula. The program generates a table displaying the binomial coefficients for the given range of 'm' and 'x'. The table is printed in a formatted manner, making it easy to read and understand. Each row of the table corresponds to a specific 'm' value, and the columns represent the corresponding 'x' values. The table provides a comprehensive view of the binomial coefficients, showing the number of ways to choose 'x' elements from a set of 'm' elements. This information can be useful in various mathematical and statistical calculations, such as combinatorics, probability, and algebraic equations.

4.

a. The C program is designed to find the median of two sorted arrays. It takes two input arrays, both of which are assumed to be sorted in ascending order. The program determines the median value by combining the elements from both arrays and finding the middle value(s) in the merged array. To achieve this, the program follows a divide-and-conquer approach. It calculates the midpoints of the two arrays and compares the corresponding elements at those positions. Based on the comparison, it discards the elements that are guaranteed to be less than the median. The process continues recursively until the median is found. If the total number of elements in the combined array is odd, the median is the middle element. If the total number of elements is even, the median is the average of the two middle elements.

b. The program aims to find the largest number in an array using recursion. It takes an array of integers as input and recursively searches for the largest number within the array. The program uses a recursive function to compare elements of the array. It starts by assuming the first element of the array is the largest. Then, it recursively compares this assumed largest number with the remaining elements of the array. If a larger number is found, it becomes the new assumed largest number. This process continues until all elements of the array have been compared.

c. The program aims to find the nearest lesser and greater elements in an array based on a given target number. The user is prompted to enter the size of the array and the array elements. Additionally, the user provides a target number for comparison. The program then determines the nearest lesser and greater elements in the array in relation to the target number.The algorithm begins by initializing the nearest lesser and greater variables as the minimum and maximum possible values, respectively. It iterates through each element of the array, comparing it with the target number. If the

element is smaller than the target number and greater than the current nearest lesser value, it becomes the new nearest lesser. Similarly, if the element is larger than the target number and smaller than the current nearest greater value, it becomes the new nearest greater.

d. The task is to write a C program that removes duplicate elements from an array. Given an array containing integers, the program should identify and eliminate any duplicate elements, leaving only the unique elements in the array. The program should modify the original array in-place and update its size accordingly. The program will iterate through the array and compare each element with the remaining elements in the array. If a duplicate element is found, it will be removed by shifting the subsequent elements to the left, effectively overwriting the duplicate element. The size of the array will be reduced by one for each duplicate element encountered.

e. The task is to write a C program that sorts a list of names in alphabetical order. Given an array of strings representing names, the program should rearrange the names such that they are sorted in ascending order based on the alphabetical order. The program will use a sorting algorithm to compare pairs of names and swap them if they are out of order. It will continue this process until the entire list is sorted. The sorting algorithm can be implemented using various techniques such as bubble sort, insertion sort, selection sort, or more efficient algorithms like quicksort or merge sort.

f. The task is to write a C program that reads a string from the user and uses a function to reverse the order of words in the string. The program will prompt the user to enter a string and then call a function to reverse the order of the words in the string. The program will analyze the input string and identify the words based on spaces or any other specified delimiters. It will then reverse the order of these words while maintaining the order of the characters within each word. For example, if the input string is "Hello World, how are you?", the program will reverse the words to form the output string "you? are how World, Hello". The program will implement the logic to reverse the words by using string manipulation techniques such as splitting the string into words, storing them in an array, and then rearranging the words in reverse order. It will handle cases where there are multiple spaces between words and ensure that the resulting string maintains the original spacing. After reversing the order of the words, the program will display the modified string to the user. The reversed string will reflect the reversed order of the words while preserving the characters within each word

5.

a. Write a C program which efficiently store and manage records of N students. The program allows the user to input the details of each student, including their name, along with other relevant information. Once all the records are entered, the program implements a sorting algorithm to arrange the student records in ascending order based on their names.

b. The C program is designed to store records of N students and sort them according to their marks. The program utilizes data structures and sorting algorithms to efficiently organize the student records based on their performance. It prompts the user to enter the number of students (N) and then dynamically allocates memory to store the required number of records. For each student, the program prompts the user to enter their name and marks. After storing all the records, it proceeds to sort them in ascending order based on the marks achieved by each student.

c. The C program uses a pointer to a structure to initialize the members within the structure. It also utilizes functions to print the student information. The program allows the user to input data for multiple students and stores the information in the structure using pointer notation. It then calls the appropriate functions to display the student details on the screen. By utilizing pointers to structures, the program optimizes memory usage and enables efficient manipulation of the student data.

6.

a. This C program utilizes pointers to check whether a given string is a palindrome or not. It prompts the user to enter a string and then uses pointer manipulation to compare characters from both ends of the string. By iterating through the string using pointers, the program checks if the characters at corresponding positions are the same or not. If all the characters match, the program concludes that the string is a palindrome. Conversely, if any pair of characters does not match, the program determines that the string is not a palindrome.

b. Write a C program allows the user to store n elements in an array and then utilizes a pointer to print the elements. The program prompts the user to enter the number of elements (n) they wish to store in the array. It dynamically allocates memory for the array based on the user's input. Next, the program asks the user to input the n elements one by one. After storing the elements in the array, it uses a pointer to iterate through the array and print each element. By leveraging pointer arithmetic, the program efficiently accesses the array elements and displays them to the user. This program provides a dynamic and pointer-based approach to store and print array elements in C.

c. Write a C program to utilize dynamic memory allocation to find the largest element in an array. It prompts the user to

enter the number of elements they wish to store in the array. Using this input, the program dynamically allocates memory for the array.

d. Write a C program allows the user to replace a specific line with another text in a file. The program prompts the user to enter the name of the file and the line number they want to replace. It then asks the user to input the new text that will replace the specified line. This program defines a function encrypt File that takes the path to an input file, the path to the output file, and an encryption key as parameters. It reads the input file line by line and encrypts each character using the provided key. The encrypted characters are then written to the output file.

e. Write a C program to perform basic operations on linked list: Creation, insertion, deletion, and traverse in linked list.

Total Lecture Hours: 30 hrs.

Mode of Evaluation

CA	ESE	Total	
50	50	100	

Course Code: EE101P	Course Name: IoT and Embedded Systems Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. The course aims to provide exposure to the applications of IoT in smart cities and industrial applications.
2. It aims to train the students to the basic concepts of the Embedded C.
3. It aims to train the students to the basic concepts of the Controller.
4. This course is designed to give the students hands-on experience with the Software and Hardware concepts.

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

1. Understand the basic concepts of sensors and transducers.
2. Understand basics of embedded system and different IoT boards.
3. Apply basic operations and programming techniques of IoT devices.
4. Apply smart technology knowledge through case studies.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. Understanding the Architecture and Pin Configuration of ESP8266 and Arduino Boards.
2. Hands-On Introduction to commonly used real world IoT Sensors.
3. Analyze Digital signal data acquisition using Arduino and ESP8266.
4. Explore Digital signal generation using Arduino and ESP8266.
5. Analyze Analog signal data acquisition using Arduino.
6. Explore Analog signal generation using Arduino.
7. Real-Time Data Logging Using ESP8266 and Arduino.
8. Designing a Lighting Control System using LDR.
9. Designing a Multi-Sensor Alert System Using Touch, IR, PIR and Arduino.
10. 1Object Detection Using Ultrasonic Sensors with Arduino and ESP.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
25	25	50	

Course Code: ME101P	Course Name: Design & Realization Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/ECE/EEE/ELCE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. To familiarize students with the modern technologies used in industries.
2. To realize the fundamentals of Computer Aided Design & digital manufacturing.

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

1. Create 2D and 3D models using Computer Aided Design software.
2. Apply 3D modelling techniques and STL file preparation for additive manufacturing.
3. Create a model using 3D printer.
4. Develop engineering components using CNC/VMC machine.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. Introduction to 2D drawing, shapes like rectangles, circles, polygons, and then modify them using tools like trim, extend, and fillet. Apply appropriate dimensions.
2. Applying constraints in 2D and 2D sketching.
3. 3D modelling of components using extrusion, revolve, loft, sweep, and multiple features.
4. Create an assembly of multiple parts with accurate mate constraints to simulate their interaction.
5. Slicing of STL file and study of the effect of process parameters like layer thickness, orientation and infill on build time using software.
6. Create a 3D printed component.
7. Create a small component using CAD file using CNC machine.
8. Create a general use component using CAD file using VMC machine.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
25	25	50	

Course Code: IT102B	Course Name: Web Designing	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. Provide students with a good understanding of the basic concepts of web design, using HTML, CSS, and JavaScript.
2. Enable students to analyse web pages using various formatting techniques of CSS and HTML.
3. Enable students to process webpage data on client machines in integration with html using JavaScript.
4. Apply the techniques of CSS, HTML and JavaScript for designing competitive websites.

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

1. Understand the concept of layout and structure of Hypertext markup language (HTML)
2. Apply the integration of Cascading style sheets (CSS) in HTML pages.
3. Apply the JavaScript concept to process and validate the data of a web page on client Machine.
4. Design the website with the application of HTML, CSS and JavaScript.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2	2	1	1	1	1	1	2	3	2	2
CO2	3	2	2	2	2	1	1	1	1	1	2	3	2	2

CO3	3	2	2	2	2	1	1	1	1	1	2	3	2	3
CO4	3	3	3	3	3	1	1	1	1	1	2	3	2	3

List Of Practical's (Indicative & Not Limited To)

1. Design the following static web pages required for an online bookstore website.

HOMEPAGE:

- The static home page must contain three **frames**.
- Top frame: Logo and the college name and links to Homepage, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

For example: When you click the link **"CSE"** the catalogue for **CSE** Books should be displayed in the Right frame. Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Website			

2. **LOGINPAGE:**

This page looks like below:

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login Page Username: Passwords: Submit Reset			

3. **CATOLOGUE PAGE:** The catalogue page should contain the details of all the books available in the website in a table. The details should contain the following:

a. Snapshot of Cover Page.
b. Author Name.
c. Publisher.
d. Price.

Add to cart button.

Logo	Website Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	   	Book: XML Bible Author: Winston Publication: Wiley Book: AI Author: S. Russel Publication: Princeton hall Book: Java 2 Author: Watson Publication: BPB publications Book: HTML in 24 hours Author: Sam Peter Publication: Sam publication	$40.5 $63 $35.5 $50	Add to cart Add to cart Add to cart Add to cart

4. **CARTPAGE:** The cart page contains the details about the books which are added to the cart. The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE	Book name	Price	Quantity	Amount
ECE	Java 2	$35.5	2	$70
EEE	XML bible	$40.5	1	$40.5
CIVIL	Total amount	- $130.5		

5. **REGISTRATION PAGE:** Create a "registration form" with the following fields

a. Name (Text field)
b. Password (password field)
c. E-mail id(text field)
d. Phone Number (text field)

e. Sex (radio button)
f. Date of birth (3 select boxes)
g. Languages known (checkboxes–English, Telugu, Hindi, Tamil)

Address (text area)

6. **JS VALIDATION:** Write ***JavaScript*** **to validate** the following fields of the above registration page. Name (Name should contains alphabets and the length should not be less than 6 characters).
Password (Password should not be less than 6 characters length).

7. JS VALIDATION:
E-mail id (should not contain any invalid and must follow the standard pattern(name@domain.com) Phone Number (Phone number should contain 10 digits only).

8**. CSS:** Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:
Use different font, styles: In the style definition you define how each selector should work(font, color etc.). Then, in the body of your pages, you refer to these selectors to activate the styles. Set a background image for both the page and single elements on the page.

9. CSS:
Control the repetition of the image with the background-repeat property. Define styles for links as
i. A:link
ii. A:visited
iii. A:active
iv. A:hover

10. Consider a small topic of your choice on which you can develop static Webpages and try to implement all topics of html, CSS and Js within the topic. Choose any one topic.
i. Your Own Portfolio
ii. To-Do List
iii. Survey Form
iv. A Tribute Page
v. A Questionnaire

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
50	**-**	**50**	

Course Code: EC202P	**Course Name: Intelligent Health Care Systems Lab**	**L**	**T**	**P**	**C**
Course Offered in: ECE		**0**	**0**	**2**	**1**

Pre-requisite: NA

Course Objective:

1. Explore Fundamentals of Health Care and the Role of Intelligent Systems in Health Care System.
2. Realize Health Care Technologies with Emerging Trends and Innovations.

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

1. Apply the Fundamentals of Health Care Systems
2. Explore the Role of Intelligent Systems in Health Care.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	2	1	1	-	1	-	-	-	1		3
CO2	3	3	2	2	1	1	-	1	-	-	-	1		3

List Of Practical's (Indicative & Not Limited To)

1. Design and Implement Automated Vital Signs Monitoring System.
2. Design and Implement Smart Alert System for Health Parameters.
3. Design and Implement Interactive Smart Tongue.

4. Design and Implement i-ball synchronized with eye rotation.
5. Design and Implement Machine Learning for Predictive Healthcare Analytics.
6. Design and Implement Wearable Heart Rate and SPO2 Monitor.
7. Design and Implement Portable ECG Monitoring System.
8. Design and Implement Smart Fall Detection System.
9. Design and Implement Non-invasive Glucose Monitor.
10. Design and Implement Smart Pill Dispenser.
11. Design and Implement Body Temperature Monitoring Patch.
12. Design and Implement Wearable EMG Muscle Activity Monitor.
13. Design and Implement Continuous Blood Pressure Monitor.
14. Design and Implement Wireless Health Monitoring System.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
50	-	50	

Course Code: EE102P	Course Name: Explorations in Electrical Engineering Lab	L	T	P	C
Course Offered in: EEE/ELCE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. Implement different circuits and verify circuit concepts for DC and AC circuits.
2. Prove the various theorems used to reduce the complexity of electrical network.
3. The operation and characteristics of AC machines and DC machines.

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

1. Understand the concepts of electric circuit solutions with DC supply using mesh-nodal analysis and Network Theorems.
2. Apply the concepts of electrical circuits with AC supply in single and three phase system
3. Analyze the equivalent circuit and performance of single-phase AC transformer
4. Illustrate the working principle of induction motors, synchronous machines and DC machines.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. Verification of Kirchhoff's Laws: Conduct an in-depth analysis of Kirchhoff's Current and Voltage Laws through practical circuit experiments, validating their applications in complex electrical networks and understanding their role in circuit analysis and design.
2. Application of Superposition Theorem in Linear Circuits: Investigate the Superposition Theorem by analysing linear electrical circuits with multiple sources. Assess the theorem's effectiveness in simplifying circuit analysis and its implications for circuit design and problem-solving.
3. Exploring Thevenin's Theorem in Circuit Analysis: Study and apply Thevenin's Theorem to convert complex circuits into simpler equivalent circuits. Examine its practical use in circuit design and troubleshooting, emphasizing real-world applications and benefits.
4. Parameter Analysis of Single-Phase AC Series RLC Circuit: Analyze and determine the key parameters (resistance, inductance, and capacitance) of a single-phase AC series RLC circuit. Explore the impact of these parameters on circuit behaviour, including impedance, phase angle, and resonance.
5. Measurement and Analysis of Power Consumption in Fluorescent Lamps: Set up and measure the power consumption of a fluorescent lamp (tube light), including an analysis of efficiency and power factors. Understand the implications for energy management and cost-efficiency in lighting systems.

6. Power Measurement and Power Factor Improvement in Single-Phase AC Circuits: Measure the power and power factor of a single-phase AC series inductive circuit. Investigate methods to improve power factor using capacitors and evaluate the impact on circuit performance and efficiency.
7. Efficiency Testing of a Single-Phase Transformer: Perform a load test on a single-phase transformer to determine its efficiency. Analyze performance under varying load conditions and understand the practical considerations for transformer operation and maintenance.
8. Speed Control Techniques for DC Shunt Motors: Explore speed control methods for DC shunt motors through armature and field control techniques. Assess the effectiveness and applications of these methods in industrial and commercial motor-driven systems.
9. Starting and Reversal of Three-Phase Induction Motors with speed monitoring: Study the operation and speed reversal of three-phase induction motors. Measure and record motor speed in both forward and reverse directions, and analyze the implications for motor control and application.
10. Calibration Techniques for Single-Phase Induction-Type Energy Meters: Perform calibration of single-phase induction-type energy meters to ensure accurate measurement of electrical energy. Explore calibration methods and their significance for metering accuracy and compliance.
11. Cut-Out Sections Demonstration of Electrical Machines: Examine and discuss cut-out sections of various electrical machines, including DC machines, three-phase induction machines, single-phase induction machines, and synchronous machines. Understand their construction, operation, and design principles through hands-on exploration.
12. Overview of Electric Vehicle Components: Demonstrate and analyze the various sections of electric vehicles. Explore the design, functionality, and integration of key components, including electric motors, battery systems, and control electronics, to understand their role in modern transportation.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
25	25	50	

Course Code: AI102P	Course Name: Python for Engineers Lab	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	4	2

Pre-requisite: NA

Course Objectives:

The objective of this course is to provide students to build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions and work with datasets to create graphs and Data Frames. considerations, and acquire hands- on skills in implementing AI solutions for real-world scenarios.

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

1. Use Python variables, operators, expressions, blocks, and numeric types to solve computational problems.
2. Apply Python conditional statements, loops, and loop control.
3. Use Python complex data types (strings, lists, tuples, dictionaries) and functions for efficient data manipulation and problem-solving.
4. Apply Python file operations for reading, writing, manipulating files, and processing structured data efficiently.
5. Develop simple programs utilizing built-in functions of Python packages like Matplotlib, NumPy, and Pandas.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. Introduction to Python: Python variables, Python basic Operators, Type Conversion, Expressions, understanding python blocks, Python Data Types, Declaring and using Numeric data types: int, float etc,

Activities:
(a) Temperature conversion, Palindrome Test, Reverse Number.
(b) Print all Strong numbers less than or equal to N.
(c) Sum and Difference of Two Numbers, Roots of Quadratic Equation."
(d) Write a python code that will read in a dictionary containing key/value pairs of names: [marks] for a list of students. Print the average of the marks array for the student's name provided, showing 2 places after the decimal.

2. Python Program Flow Control Conditional blocks: If, else and else if, simple for loops in python, For loop using ranges, Use of while loops in python, Loop manipulation using pass, continue, break and else, Programming using Python conditional and loop blocks Activities:
(a) Count the number of even and odd numbers from a series of numbers.
(b) Print a list in reverse order (from last to the first item) using while and for-in loops.
(c) When interest compounds q times per year at an annual rate of r % for n years, the principle p compounds to an amount a as per the following formula a = p (1 + r / q) nq "
(d) Convert all lowercase letters to uppercase letters and vice versa.
(e) Program to access the index of a list, Program to append a list to the second list.
(f) Make a nested loop and a python closure to make functions to get multiple multiplication functions using closures. That is using closures, one could make functions to create multiply_with_5() or multiply_with_4() functions using closures."

3. Python Complex Data Types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type, String, List and Dictionary, Manipulations Building blocks of python programs, String manipulation methods, List manipulation, Python Functions, Organizing python codes using functions, Sort the sentence in alphabetical order/ remove punctuations from the given string

Activities:
(a) Program to get a string made of the first 2 and last 2 characters of a given string. If the string length is less than 2, return the empty string instead.
(b) You are given the first name and last name of a person on two different lines. Your task is to read them and print the following: Hello first name last name! You just delved into python."
(c) Program to create a dictionary of keys x, y, and z where each key has as value a list from 11-20, 21-30, and 31-40 respectively. Access the fifth value of each key from the dictionary
(d) Implement a Python code snippet that takes an integer n as input, followed by n space-separated integers, creates a tuple T with those integers, and then calculates and outputs the hash value of the tuple using the built-in hash() function.
(e) Program to create a dictionary of keys x, y, and z where each key has as value a list from 11-20, 21-30, and 31-40 respectively. Access the fifth value of each key from the dictionary"

4. Python File Operations**:** Reading files, Writing files in python, Understanding read functions, read(), read line(), read lines(), Understanding write functions, write() and write lines(), Manipulating file pointer using seek Programming, using file operations. Activities:
(a) Read content from one file and write it into another file.
(b) Pulling a random word or string from a line in a text file in Python
(c) Create a file where all letters of English alphabet are listed by specified number of letters on each line."
(d) Write a dictionary to a file in Python
(e) Create a file where all letters of English alphabet are listed by specified number of letters on each line.
(f) Program to convert a date of yyyy-mm-dd format to dd-mm-yyyy format."

5. Python Packages: Simple programs using the built-in functions of packages matplotlib, simple programs using the built-in functions of packages NumPy, pandas etc.
Activities:
(a) Write a program in python to find maximum values over index in Data frame.
(b) Read all product sales data and show it using a multiline plot. (Data will be provided by faculty for analysis).
(c) WAP to create a 5X2 integer array from a range between 100 to 200 such that the difference between each element is 10."
(d) Case Study based LAB: Case study Based on Matplotlib, Pandas, NumPy, that work on retail sales data, Credit card transaction data etc. Students will find patterns and they will draw inferences based on statistical results that were found using the packages. (Faculty will provide case study)"

Total Lecture Hours: 30 hrs.

Mode of Evaluation

CA	ESE	Total	
50	**50**	**100**	

Course Code: EE103P	Course Name: Emerging Technologies for Engineers Lab	L	T	P	C
Course Offered in: EEE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. To learn the basic concepts of cloud computing and its underlying technologies with its implementation.
2. To learn the basic concepts of Blockchain and its underlying technologies with its implementation.

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

1. Understand the concepts of Industry 1.0 to Industry 5.0 & 5G technology.
2. Apply the MATLAB for Engineering Applications
3. Understand the concepts of cloud computing
4. Understand the concepts of block chain.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

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

List Of Practical's (Indicative & Not Limited To)

1. To acquire data from sensors using MATLAB.
2. To visualize data from sensors using MATLAB.
3. To implement data transmission using the MQTT protocol.
4. To log sensor data and perform analysis using MATLAB.
5. To create a real-time dashboard for visualizing IoT data using MATLAB.
6. To understand Data Analysis with AWS S3 and MATLAB.
7. To perform real-time data analysis using MATLAB and AWS services
8. To understand the basic concepts of Blockchain technology and create a simple Blockchain using MATLAB.
9. To understand MATLAB and AWS Lambda Integration.
10. To process a dataset using Google Cloud Functions and MATLAB.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total
25	25	50

Course Code: EE105P	Course Name: Electrical Engineering Workshop	L	T	P	C
Course Offered in: ELCE		0	0	2	1

Pre-requisite: NA

Course Objectives:

1. Develop practical skills in residential electrical wiring, including series and parallel circuits, staircase wiring, and safety devices such as isolators, MCBs, and ELCBs.
2. Acquire hands-on experience in soldering techniques, PCB assembly, and the operation of transformers, along with an understanding of electrical components and symbols.
3. Gain knowledge of substation components and domestic wiring systems, including the estimation and layout of electrical circuits for a typical BHK house.

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

1. Apply residential wiring techniques, ensuring proper installation and testing of electrical components and safety devices.
2. Perform proficient soldering on PCBs, connecting components with accuracy and reliability.
3. Analyze and understand the construction, operation, and applications of transformers, rectifiers, and the key components of electrical supply systems.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)														
CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	2	2	2	2	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	2	-	-	-	-	-	-	-	2	-	-
CO3	3	3	2	2	-	-	-	-	-	-	-	3	-	-

List Of Practical's (Indicative & Not Limited To)

1. To practice the use and application of workshop tools. Also, learn the Electrical and Electronics Symbols.
2. To perform the operation of two lamps in series and parallel
3. To perform the staircase wiring and its testing
4. To practice the soldering techniques and connecting wires, components connection to a PCB.
5. To perform BHK house wiring including distribution board using isolator, MCB, ELCB.
6. To study the construction and operation of a transformer.
7. To visit the college substation and familiarize the supply system, Transformer, HT Panel and Distribution, etc.
8. Ohm's Law Verification: Use circuit simulation software like LT spice or Multisim to design a circuit verifying Ohm's law.
9. Sinusoidal Waveforms**:** Plot sinusoidal waveforms in MATLAB. Vary the amplitude, frequency, and phase to observe the changes.
10. To study Diodes and Rectifiers. Building and analyzing half-wave and full-wave rectifier circuits using MATLAB.

Total Lecture Hours: 15 hrs.

Mode of Evaluation

CA	ESE	Total	
25	**25**	**50**	

Course Code: HS103B	**Course Name: Basic Proficiency in Japanese**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**0**	**0**	**4**	**2**

Pre-requisite: NA

Course Objectives:

1. To Develop basic listening, speaking, reading and writing proficiency in the target language, enabling global communication skills.
2. To Foster an understanding of intercultural communication, particularly between Indian and target-language-speaking cultures.
3. Introduce students to the global significance of the target language and appreciate its culture & ethics in international contexts.

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

1. Understand how language and culture interact in global context and impact intercultural communication
2. Introduce themselves in the respective language and understand the syllables and number
3. Apply their learning in basic conversations and understand the social etiquette of professional world
4. Utilize the skills of listening, speaking and non-verbal communication in the target language

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)												
CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	-	-	-	-	-	1	3	-	1
CO2	-	-	-	-	-	-	-	-	1	3	-	1
CO3	-	-	-	-	-	-	-	-	1	3	-	1
CO4	-	-	-	-	-	-	-	-	1	3	-	1

Unit 1	**Basic Component of Japanese**	**09 hours**

- Express and understand basic greetings
- Say his/her name and ask others
- Ask, answer and understand questions on nationality
- Identify, say and understand numbers from 1-20

- Orally present oneself briefly. (using simple adjectives)
- Recognize and spell correctly alphabet in **Japanese**
- Understand and use basic classroom instructions.

Unit 2	**Shopping and Dining in Japan**	**09 hours**

- Topics: Asking for prices, ordering food, and making simple requests
- Listening: Store and restaurant dialogues
- Speaking: Role-playing customer interactions in shops and restaurants
- Cultural Focus: Japanese dining etiquette and manners

Unit 3	**Technology and Digital Communication in Japanese**	**09 hours**

- Topics: Messaging apps, writing short emails
- Listening: Voice message comprehension, instructions in Japanese
- Speaking: Simulating phone conversations and digital communication
- Cultural Focus: Technology use in Japan and its impact on communication

Unit 4	**Respecting Japanese and Indian Cultures in Global Context**	**09 hours**

- Topics: Japanese traditions, festivals, family structures, Japanese language in international business and cultural exchange
- Listening: Japanese discussions on family and holidays
- Cultural Comparison: Japanese vs. Indian family values, hierarchical structures

	Total Lecture Hours	**30 hours**

Mode of Evaluation (Reference Annexure-5)

MSE		**CA**	**ESE**	**Total**	
MSE1	**MSE2**				
40	**40**				
80		**20**	**-**	**100**	

Course Code: HS104B	**Course Name: Basic Proficiency in German**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**0**	**0**	**4**	**2**

Pre-requisite: NA

Course Objectives:

1. To Develop basic listening, speaking, reading and writing proficiency in the target language, enabling global communication skills.
2. To Foster an understanding of intercultural communication, particularly between Indian and target-language-speaking cultures.
3. Introduce students to the global significance of the target language and appreciate its culture & ethics in international contexts.

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

1. Understand how language and culture interact in global context and impact intercultural communication
2. Introduce themselves in the respective language and understand the syllables and number
3. Apply their learning in basic conversations and understand the social etiquette of professional world
4. Utilize the skills of listening, speaking and non-verbal communication in the target language

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	-	-	-	-	-	1	3	-	1
CO2	-	-	-	-	-	-	-	-	1	3	-	1
CO3	-	-	-	-	-	-	-	-	1	3	-	1
CO4	-	-	-	-	-	-	-	-	1	3	-	1

Unit 1	**Basic Component of German**	**09 hours**

- Express and understand basic greetings
- Say his/her name and ask others
- Ask, answer and understand questions on nationality
- Identify, say and understand numbers from 1-20

- Orally present oneself briefly. (using simple adjectives)
- Recognize and spell correctly alphabet in German.
- Understand and use basic classroom instructions.

Unit 2	**Navigating Everyday Situations**	**09 hours**

- Topics: Asking for directions, shopping
- Listening: Conversations in stores, public transport
- Speaking: Role-playing travel and shopping scenarios
- Cultural Focus: Understanding German customer service and politeness

Unit 3	**Digital and Non-verbal Communication in German**	**09 hours**

- Topics: Writing formal/informal emails, texts
- Listening: Voice messages, email instructions
- Speaking: Practicing phone calls and messages
- Cultural Focus: Differences in professional communication styles in Germany

Unit 4	**Respecting German and Indian Cultures in Global Context**	**09 hours**

- Topics: Work culture, family values, and celebrations, German language in international business and tourism
- Listening: German perspectives on holidays and family life
- Cultural Comparison: Indian vs. German approaches to work-life balance

	Total Lecture Hours	**30 hours**

Mode of Evaluation (Reference Annexure-5)

MSE		**CA**	**ESE**	**Total**	
MSE1	**MSE2**				
40	**40**				
80		**20**	**-**	**100**	

Course Code: HS105B	**Course Name: Basic Proficiency in French**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**0**	**0**	**4**	**2**

Pre-requisite: NA

Course Objectives:

1. To Develop basic listening, speaking, reading and writing proficiency in the target language, enabling global communication skills.
2. To Foster an understanding of intercultural communication, particularly between Indian and target-language-speaking cultures.
3. Introduce students to the global significance of the target language and appreciate its culture & ethics in international contexts.

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

1. Understand how language and culture interact in global context and impact intercultural communication
2. Introduce themselves in the respective language and understand the syllables and number
3. Apply their learning in basic conversations and understand the social etiquette of professional world
4. Utilize the skills of listening, speaking and non-verbal communication in the target language

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	-	-	-	-	-	-	-	-	1	3	-	1
CO2	-	-	-	-	-	-	-	-	1	3	-	1
CO3	-	-	-	-	-	-	-	-	1	3	-	1
CO4	-	-	-	-	-	-	-	-	1	3	-	1

Unit 1	**Basic Component of French Language**	**09 hours**

- Express and understand basic greetings
- Say his/her name and ask others
- Ask, answer and understand questions on nationality
- Identify, say and understand numbers from 1-20
- Orally present oneself briefly. (using simple adjectives)

- Recognize and spell correctly alphabet in French
- Understand and use basic classroom instructions.

Unit 2	Basic Communication and Social Etiquette	09 hours

- Topics: Greetings, introductions, simple conversations, Identify, say and understand numbers from 21-50
- Listening Activities: Audio recordings of daily conversations (e.g., asking directions)
- Speaking Practice: Role-playing everyday scenarios (e.g., at a café, meeting new people)
- Cultural Focus: French social etiquette, mealtime behavior

Unit 3	Expressing Needs and Asking Questions	09 hours

- Topics: Asking for help, making requests, and inquiries, Identify, say and understand numbers from 51-100
- Listening: Simple dialogues (e.g., ordering food, asking for information)
- Speaking: Formulating questions and responses
- Cultural Focus: Formal vs. informal communication in France

Unit 4	Respecting German and Indian Cultures in Global Context	09 hours

- Topics: Understanding French family values, traditions, and how they differ from Indian values, French language in international diplomacy, travel, and business
- Activities: Discussions on holidays, family dynamics, and festivals
- Comparison: French cuisine vs. Indian cuisine, cultural symbolism

Total Lecture Hours	30 hours

Mode of Evaluation (Reference Annexure-5)

MSE		CA	ESE	Total
MSE1 40	MSE2 40			
80		20	-	100

Course Code: HS106B	Course Name: Basic Proficiency in Spanish	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	4	2

Pre-requisite: NA

Course Objectives:

1. To Develop basic listening, speaking, reading and writing proficiency in the target language, enabling global communication skills.
2. To Foster an understanding of intercultural communication, particularly between Indian and target-language-speaking cultures.
3. Introduce students to the global significance of the target language and appreciate its culture & ethics in international contexts.

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

1. Understand how language and culture interact in global context and impact intercultural communication
2. Introduce themselves in the respective language and understand the syllables and number
3. Apply their learning in basic conversations and understand the social etiquette of professional world
4. Utilize the skills of listening, speaking and non-verbal communication in the target language

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	1	3	-	1
CO2	-	-	-	-	-	-	-	-	1	3	-	1
CO3	-	-	-	-	-	-	-	-	1	3	-	1
CO4	-	-	-	-	-	-	-	-	1	3	-	1

Unit 1	Basic Component of Spanish	09 hours

- Express and understand basic greetings
- Say his/her name and ask others
- Ask, answer and understand questions on nationality
- Identify, say and understand numbers from 1-20
- Orally present oneself briefly. (using simple adjectives)

• Recognize and spell correctly alphabet in Spanish. • Understand and use basic classroom instructions.		
Unit 2	**Navigating Common Situations**	**09 hours**
• Topics: Asking for help, giving directions • Listening: Directions, shopping dialogues • Speaking: Role-playing travel and shopping scenarios • Cultural Focus: Politeness in Spanish-speaking cultures, regional differences		
Unit 3	**Using Technology in Spanish Communication**	**09 hours**
• Topics: Writing emails, texting, using social media • Listening: Voice notes, social media interactions • Speaking: Practicing digital communication in Spanish • Cultural Focus: The use of technology in Spanish-speaking countries		
Unit 4	**Respecting Spanish and Indian Cultures in Global Context**	**09 hours**
• Topics: Spanish festivals, cultural differences in communication, The importance of Spanish in global communication • Listening: Cultural discussions, traditions in Spain • Cultural Comparison: Spanish siesta vs. Indian work culture, family structure		
	Total Lecture Hours	**30 hours**

Mode of Evaluation (Reference Annexure-5)

MSE		CA	ESE	Total
MSE1	MSE2			
40	40			
80		20	-	100

Course Code: HS101B	**Course Name: Communication Skills**	**L**	**T**	**P**	**C**
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		**0**	**0**	**4**	**2**

Pre-requisite: NA

Course Objectives:

1. To develop the Listening skills in professional setting.
2. To acquaint students with the techniques of Reading comprehension and note making for specific information, and grammatically correct organization of ideas.
3. To help students develop their Writing skills by building their vocabulary through word formation methods and writing principles.
4. To help students apply the basics of Communication and voice dynamics for effective speech delivery.
5. To develop Professional practices of communication at workplace.

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

1. Understand the essentials of communicating in a professional setting.
2. Comprehend correct English usage and formal style of Listening and speaking.
3. Apply the usage of verbal and non-verbal cues in presentation and day-to-day communication.
4. Develop Communication skills that meet the nature and objectives of the workplace.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	-	3	-	1
CO2	-	-	-	-	-	-	-	-	-	3	-	1
CO3	-	-	-	-	-	-	-	-	-	3	-	1
CO4	-	-	-	-	-	-	-	-	-	3	-	1

Unit 1	**Basic Component of Spanish**	**09 hours**

1. Ice Braking Session-Self Analysis using SWOC Activities (Identification of Individual Strength, Weakness, Opportunity and Threats/Challenges)
2. Vocabulary Enhancement Activity using worksheet

3. Formal day-to-day Conversation activity on planning real time situation using past week Vocabulary.
4. Paragraph development in 100-120 words using newspaper editorials.
5. Speaking to introduce person, places and events.
6. Evaluation of Students using written and speaking activity
7. Reading Comprehension
8. Idea pitching using (Group)
9. Role play activity creating awareness on real time situation (Group)
10. Essay writing on PESTLE range of topics
11. Blog writing using PESTLE range of topics
12. Thematic presentation
13. Review of scientific article/ books/blogs/news
14. Evaluation of Students using written and speaking activity- JAM

Total Lecture Hours	**30 hours**

Mode of Evaluation (Reference: Annexure-2)

MSE		CA	ESE	Total
MSE1 40	MSE2 40			
80		20	-	100

Course Code: ID104B	Course Name: Innovation and Entrepreneurship	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	2	1

Pre-requisite: NA

Course Objectives:

The course will provide hands-on learning experiences, problem-solving skills, product development knowledge, and interpersonal skills necessary for future entrepreneurs. By the end of the course, students will be equipped to start working on their start-up ideas or develop entrepreneurial competencies that will be beneficial for careers in both industry and business.

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

1. Understand different types of innovation, innovative thinking and their role in solution of real-world challenges.
2. Understand creative problem-solving skills and use the Business Model Canvas to shape viable business ideas.
3. Analyze market research, identify target customers, and validate business ideas using data-driven insights.
4. Understand pitch business ideas, integrate expert feedback, and pursue funding or mentorship opportunities.

CO-PO Mapping (Scale 1: Low, 2: Medium, 3: High)

CO-PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	2	2	-	2	-	2	2
CO2	-	-	-	-	-	2	2	-	2	-	2	2
CO3	-	-	-	-	-	2	2	-	2	-	2	2
CO4	-	-	-	-	-	2	2	-	2	-	2	2

Unit 1	**Innovation & Creativity**	**03 hours**

- Resource Person: Technical Expert/ Innovator/Entrepreneur
- Content Overview: Introduction to Innovation, the importance of Innovation in life, Type of Innovation, Stages of Innovation, success stories, and opportunities available to students.

Unit 2	**Idea/ Innovation Generation, Commercialization & Business Model Canvas Workshop**	**04 hours**

- Resource Person: Innovation Coaches/Startup Mentors
- Content Overview: Techniques for brainstorming, creativity exercises, introduction to the Business Model Canvas, and developing business concepts.

Unit 3	**Market Research and Validation Workshop**	**04 hours**

- Resource Person: Market Research Analysts/Marketing Professors
- Content Overview: Conducting market research, understanding target customers, market segmentation, and validating business ideas.

Unit 4	**Prototype Development & Pitching Workshop**	**04 hours**

- Resource Person: Product Developers/Venture Capitalists
- Content Overview: Creating a minimum viable product (MVP), hands-on prototyping, crafting, and delivering a compelling pitch.

Total Lecture Hours	**15 hours**

For reference: To ensure maximum engagement and learning, the course will be delivered through:

- Ignite (Master Class)
- Startup Interactions: lectures from successful entrepreneurs, startup founders, and investors
- IPR workshop
- Team Formation (Interdisciplinary minimum 3 dept)
- Mentorship & Guidance: Faculty mentors
- Hackathons: Prototyping, branding, and pitching

Mode of Evaluation

CA	ESE	Total
50	-	50

Course Code: HS1XXB	Course Name: Indian Knowledge System/ Self-Growth	L	T	P	C
Course Offered in: CSE/CS/IT/CSIT/CSE(AI)/CSE(AIML)/ECE/EEE/ELCE/ME		0	0	2	NC

Self-Growth: Students need to choose any one from the Courses offered (Reference: Annexure-4)

1. Piano
2. Tabla
3. Guitar
4. Drums
5. Vocals (Classical)
6. Vocals (Western)
7. Harmonium
8. Rap
9. Beatboxing
10. Acting
11. Script Writing
12. Makeup And Props
13. Classical Dance
14. Folk Dance
15. Western Dance
16. Bollywood Dance
17. Cinematography
18. Sound Production
19. Photography & Photo Editing
20. Graphic Designing
21. Social Service
22. Painting
23. Poetry (Hindi)
24. Shooting
25. Table Tennis
26. Billiards (Pool)
27. Badminton
28. Lawn Tennis
29. Cricket
30. Basketball
31. Kabaddi
32. Volleyball

33. Football
34. Athletics
35. Karate
36. Power Yoga

Indian Knowledge System: Students need to choose any one from the Courses offered (Reference: Annexure-3)

1. Case Study of Indian water storage system
2. Case study of Indian urban planning (Indus valley civilization)
3. Learning of Geeta for Engineers
4. Vasudhaiva kutumbakam: Indian model of multiculturalism
5. Basic treatments through yoga
6. Review socialism in light of Ramayana (critical thinking)
7. The relevance and applicability of Chanakya's (Kautilya) Arthaśāstra for solving current societal problems
8. Corporate Social Responsibility: A Philosophical Social Engineering approach from an ancient Indian Perspective.
9. Lessons of leadership from Mahabharat
10. Case study of Jantar Mantar in Delhi.
11. Study of Ancient Indians technology for extraction, purification, and alloying of metals such as gold, silver, copper, and iron.
12. Study of herbs used in kitchen for healthy life (Haldi, Garlic etc.)
13. Study of Indian Astro log system
14. Study Significance of the Asanas, Pranayams and Surya Namaskar
15. Study of Indian Ragas in music
16. Study of Vaastu Shastra
17. Study of Importance of gum bads in ancient structure of India
18. Study of Ayurveda
19. Impact of Satvik Food on the Gut-Microbiome Diversity
20. Orientation of temples of South India and their astronomical associations
21. The Hidden Science of Mahakumbh: Beyond Faith and Rituals

Annexure-1

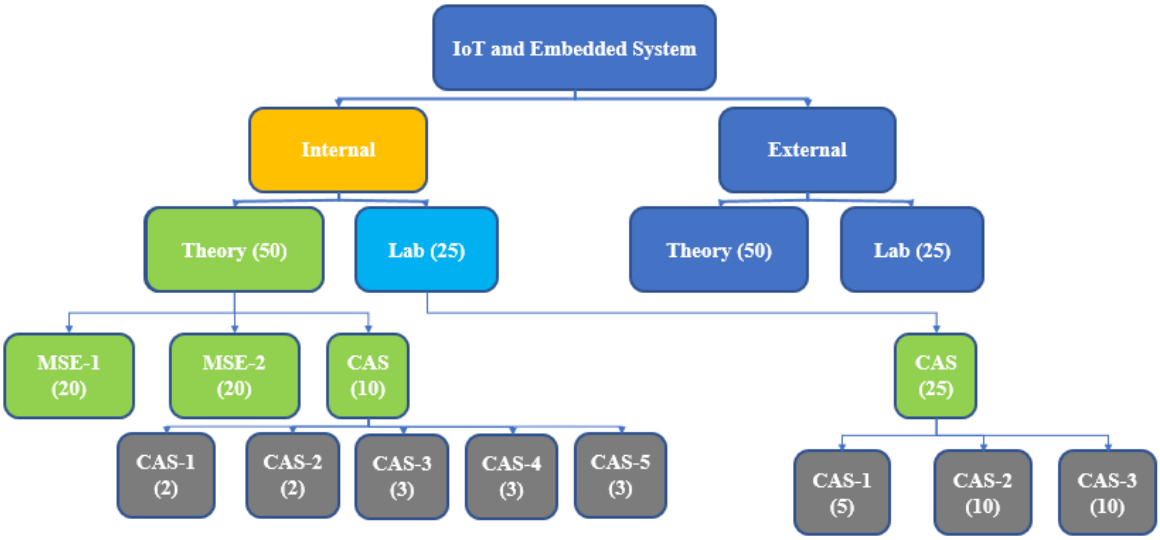
Course Evaluation Plan for IoT and Embedded Systems

Course Evaluation Structure

The evaluation of the **IoT and Embedded Systems** course consists of both **theory** and **lab** assessments. The assessments are divided into multiple components as outlined below.

Students will work in **groups of 4**, formed roll number-wise. The project evaluation will follow three levels of progression:

- **Level 1 (Basics) - MSE-1 Evaluation**: Students will be assigned basic projects.
- **Level 2 (Modification) - MSE-2 Evaluation**: Students must update or modify their Level 1 projects.
- **Level 3 (New Problem) - ESE Evaluation**: Students will be assigned a new problem statement to develop and demonstrate. External examiners will evaluate the final project.



Theory Evaluation Plan

1. **Continuous Assessment Scheme (CAS) - Total Marks: 10**
   - CAS-1: 2 Marks (Based on continuous assessment test)
   - CAS-2: 2 Marks (Based on continuous assessment test)
   - CAS-3: 3 Marks (Based on continuous assessment test)
   - CAS-4: 3 Marks (Based on attendance)
   - CAS-5: 3 Marks (Based on participation in events)
   - **Best 4 CAS scores will be considered.**

2. **Mid-Semester and End-Semester Evaluations - Total Marks: 50 Internal, 50 External**
   - MSE-1: 20 Marks (Project Level 1)

- MSE-2: 20 Marks (Project Level 2)
- CAS: 10 Marks (Based on continuous assessment)
- ESE: 50 Marks (New problem Level 3, externally evaluated)

Lab Evaluation Plan

Students will work in **groups of 4**, formed roll number-wise.

1. **Continuous Assessment Scheme (CAS) - Total Marks: 25**
   - CAS-1: 5 Marks (Regular lab activities, Quiz, Viva and Lab work)
   - CAS-2: 10 Marks (Regular lab activities, Quiz, Viva and Lab work)
   - CAS-3: 10 Marks (Regular lab activities, Quiz, Viva and Lab work)

2. **Internal and External Marks Distribution**
   - **Internal:** 25 Marks (CAS-25)
   - **External:** 25 Marks (Project demonstration during ESE)

Key Instructions for Students

- Active participation and timely submission of projects are mandatory.
- Attendance and engagement in events are part of the evaluation.
- Ensure innovation and creativity while upgrading or building projects.
- External examiners will strictly evaluate ESE projects on demonstration and problem-solving.

Annexure-2

MEPRO English Communication Skills (Assessment Platform)

The main points about the MEPRO English Communication Skills training and assessment platform from Pearson Education, which will be available to B. Tech 1st-year students (CSE, CSIT, ECE, & IT) during the even semester:

- **Skill Boosting:** MEPRO helps improve listening, speaking, reading, writing, grammar, and vocabulary skills in English through ten fun and practical modules. Each module comprises a mix of social and professional contexts that are engaging and assist in developing contextual vocabulary suitable to a variety of situations.
- **Personalized Learning:** It's a smart tool that adapts to each student's needs, making learning personal and helping everyone progress at their own pace.
- **Illustrated themes:** with anime type characters to retain the interest of the young learners with a storytelling approach and catchy visuals.
- **Continuous Progress:** Students can track their progress with regular assessments in all modules. Each student needs to score at least 70% to move to the next level, ensuring everyone learns effectively.
- **Measurable outcomes** - International Standards: All assessments and certifications are aligned with the internationally recognized CEFR levels of English proficiency, from A-1 to C-2, and Pearson's Global Scale of English (GSE). Badges and certifications that the students achieve are shareable on platforms like LinkedIn and add to the students job prospects.
- **Quality learning:** as the platform operates on an "all-or-none" basis, the learners need to be sure, especially in the writing section, that their accuracy is 100% as even a punctuation error will make them attempt the whole writing section again.

Assessment is built into the learner's experience and curriculum to measure student's level and progress through the curriculum:

Review Tests after each set of five assignments to show learners how they're doing in the course.

Remediation is offered according to the low-performing areas

A Level Progress Test at the end of each course checks learners' understanding and recollection of all key learning points from the course. The learner gets a certification on completing each level.

Speaking exercise - Features a speech-to-text recognition engine (and vice-versa) that gives a necessary explanation & possible answer to help students create their answer(s) better.

The program allows the administrator/teacher to monitor and measure each student's progress through the learning platform.

The learning platform opens with a diagnostic test that determines the present proficiency level of the students in English Communication and the learners get placed into apt learning levels accordingly.

The task-based language teaching (TBLT) feature of the software focuses on using authentic language and asking students to do meaningful tasks using the target language. The course follows a pedagogy that is communicative & engaging. The courses use the integrated skills approach, i.e., the learners practice several skills—such as reading, listening, speaking, and grammar—in the same module, rather than practising skills in isolation.

Annexure-3

Standard Operating Procedure (SOP) for Global Elective "Indian Knowledge System"

Even Semester 2024-25 | First-Year Students

This elective course is part of the Indian Knowledge System, designed to introduce India's rich scientific heritage and its relevance in addressing day to day challenges.
The key modalities are:

1. CSE AI
2. CSE AI & ML
3. CS
4. ME
5. EEE
6. ELCE

1. Objectives of Course:

- To familiarize students with the core principles, philosophies, and historical evolution of the Indian Knowledge System, including its contributions to various fields such as science, mathematics, medicine, arts, and literature.
- Promote Cultural Awareness and Heritage Appreciation.
- To enable students to integrate traditional Indian knowledge and practices with contemporary problem-solving approaches, enhancing holistic thinking and sustainable solutions in various domains.

2. Domains Offered and Seat Capping:

S. No.	Course Name	Course Code	Capping of seat on MSERP
1	Case Study of Indian water storage system.	HS180B	55
2	Case study of Indian urban planning (Indus valley civilization).	HS181B	55
3	Learning of Bagvad Geeta for Engineers.	HS182B	55
4	Vasudhaiva kutumbakam: indian model of multiculturalism	HS183B	55
5	Basic treatments through yoga	HS184B	55
6	Review socialism in light of Ramayana (critical thinking)	HS185B	55
7	The relevance and applicability of Chanakya's (Kautilya) Arthaśāstra for solving current societal problems	HS186B	55
8	Lessons of leadership from Mahabharat	HS187B	55
9	Case study of Jantar Mantar in Delhi.	HS188B	55
10	study of Ancient Indians technology for extraction, purification, and alloying of metals such as gold, silver, copper, and iron	HS189B	55
11	Study of herbs used in kitchen for healthy life(Haldi, Garlic etc.)	HS190B	55

12	Study of Indian Astrolog system	HS191B	55
13	Study Significance of the Asanas , Pranayams and Surya Namaskar	HS192B	55
14	Study of Indian Ragas in music	HS193B	55
15	Study of Vastu Shastra	HS194B	55
16	Study of Importance of gumbads in ancient structure of india	HS195B	55
17	Study of Ayurveda	HS196B	55
18	Impact of Satvik Food on the Gut-Microbiome Diversity	HS197B	55
19	Orientation of temples of South India and their astronomical associations	HS198B	55
20	Corporate Social Responsibility: A Philosophical Social Engineering approach from an ancient Indian Perspective	HS199B	55
21	The Hidden Science of Mahakumbh: Beyond Faith and Rituals	HS179B	55

3. Branch wise Students and Seats offered:

As per our record, a total number of **1019 students** will be enrolled in Global Open Elective "Indian Knowledge system (IKS)" in the Even Semester 2024-25. The students will choose the domain of their interest on the basis of first comes first serve. The branch wise students and total seat available in 20 domains of "IKS" are as follows:

S. No.	Course	Branch	No. of Students	Seats available
1	B.Tech.	CSE AI	292	1100
2	B.Tech.	CSE AIML	221	
3	B.Tech.	CS	292	
4	B.Tech.	ME	68	
5	B.Tech.	EEE	76	
6	B.Tech.	ELCE	70	
Total			1019	

4. Proposed Scheduled of Classes:

The classes for "IKS" (even semester 2024-25) are expected to commence from 8th Feb 2025. The classes will conducted on working Saturdays (2nd, 4th, & 5th) or during the extended hours in weekdays, based on the demands of the chosen skill set.

5. Learning methodology and Classes:

a. **Self- Exploration:** To promote self-learning and self-exploration, students are encouraged to independently explore their chosen domain using the available literature, Internet (but not copy paste as it is), or by visiting the relevant places. There will be no formal teaching in this course.
b. **Interactive Sessions:** Interactive sessions will be conducted on working Saturdays (i.e. 2nd, 4th, & 5th Saturdays) under the supervision of respective domain Faculty coordinators.
c. **T**he Faculty Coordinators will help the students to clarify their doubt during interactive session.
d. **Engineering Approach**: Students need to use an engineering mind-set to explore ancient engineering methods or managerial strategies for solving the real life problems.

6. Attendance Policy:
Although this is a non-credit course but attendance criteria is same as per the Institute policy and passing this is mandatory. Failure to do so will require a student need to repeat the course.

7. Assessment:
The presentation submitted by the student must be 80 % original in nature.

- **Midterm Assessment: 10 marks**
- **Final Assessment: 40 marks**

The Relative grades will be awarded to the students on the basis of marks secured in the assessments.

Excellent
Very good
Good
Repeat

Dates of final presentations, Midterm/Final Assessments will be intimated by the Office of DSW / Controller of examination.

8. Roles and Responsibilities:

a. Faculty Coordinators:

- The faculty coordinators will be responsible for conduction of classes and closely coordinate overall coordinator.
- Faculty coordinators will monitor the students' progress and mark attendance on MSERP. The faculty coordinator will be the first point of contact for any query of students.
- The faculty coordinator will be responsible for all assessments and uploading of Marks on MSERP.

b. Overall Coordinator:

- The overall coordinator of Global Elective "IKS" will be responsible for smooth conduction of classes of all domain.
- Provide administrative support to the faculty coordinator, and student coordinator for smooth conduction of classes.
- He will be responsible for timely get Midterm/final assessment done and uploading of marks on MSERP of all domains by faculty coordinators.
- The overall coordinator will report the course update to the Dean Student Welfare.

Annexure-4

Standard Operating Procedure (SOP) for Global Elective "Self Growth"

Even Semester 2024-25 | First-Year Students

This elective is part of the *Self-Growth* initiative, designed to enhance students' self-awareness, emotional intelligence, and overall well-being- mentally, emotionally, and physically-helping the students to become the best version of themselves. This SOP applies to all the first-year students enrolled in the following courses/ branches –

1. CSE
2. IT
3. CSIT
4. ECE

1. Objectives of Course:

The "Self-Growth" course aims to provide a holistic approach to personal development by incorporating various creative and recreational activities with the essence of 64 kalas of ancient Indian culture. The key objectives are as follows:

1. **Boosting Confidence and Communication Skills.**
2. **Fostering Creativity and Artistic Skills.**
3. **Encouraging Physical and Mental Well-being.**
4. **Developing Teamwork and Leadership Qualities.**

2. Domains Offered and Seat Capping:

S. No	Subject Code	Subject Name	Capping of seat	S. No	Subject Code	Subject Name	Capping of seat
1	HS126B	Piano	25	**19**	HS144B	Photography & Photo Editing	25
2	HS127B	Tabla	25	**20**	HS145B	Graphic Designing	25
3	HS128B	Guitar	25	**21**	HS146B	Social Service	40
4	HS129B	Drums	25	**22**	HS147B	Painting	40
5	HS130B	Vocals (Classical)	25	**23**	HS148B	Poetry (Hindi)	25
6	HS131B	Vocals(Western)	25	**24**	HS149B	Shooting	40
7	HS132B	Harmonium	25	**25**	HS150B	Table tennis	25
8	HS133B	Rap	25	**26**	HS151B	billiards (Pool)	25
9	HS134B	Beatboxing	25	**27**	HS152B	Badminton	40
10	HS135B	Acting	25	**28**	HS153B	Lawn tennis	25
11	HS136B	Script Writing	25	**29**	HS154B	Cricket	50
12	HS137B	Makeup And Props	25	**30**	HS155B	Basketball	40
13	HS138B	Classical Dance	25	**31**	HS156B	Kabaddi	30
14	HS139B	Folk Dance	25	**32**	HS157B	Volleyball	30
15	HS140B	Western Dance	25	**33**	HS158B	Football	50
16	HS141B	Bollywood Dance	25	**34**	HS159B	Athletics	30
17	HS142B	Cinematography	25	**35**	HS160B	Karrate	30
18	HS143B	Sound Production	25	**36**	HS161B	Power Yoga	30

3. Branch wise Students and Seats offered:

As per our record, a total number of **1017 students** will be enrolled in Global Open Elective "Self Growth" in the Even Semester 2024-25. The students will choose the domain of their interest on the basis of first

comes first serve. the branch wise students and total seat available in 36 domains of "Self Growth" are as follows:

S. No.	Course	Branch	No. of Students	Seats available
1	B.Tech	CSE	364	1050
2	B.Tech	CSIT	220	
3	B.Tech	IT	218	
4	B.Tech	ECE	219	
		Total	1021	1

4. Proposed Scheduled of Classes:

The classes for "Self Growth" (even semester 2024-25) are expected to commence from 8th Feb 2025. The classes will conducted on working Saturdays (2nd, 4th, & 5th) or during the extended hours in weekdays, based on the demands of the chosen skill set.

5. Learning methodology and Classes:

1. There will be no formal classroom sessions for this course.
2. **Peer learning**: students coordinators (senior students) involved in various cultural clubs will guide students in developing the chosen skill set. This peer learning will occur on working Saturdays (2nd, 4th, & 5th) or during the extended hours in weekdays, based on the demands of the chosen skill set.
3. Senior students have been assigned to each skill set, and a faculty coordinator will monitor the students' progress.
4. **Self-Practice:** The student and faculty coordinators will motivate students in their respective domains to engage in self-practice to achieve proficiency in their chosen fields. Students will also be encouraged to obtain certifications in their respective domains.
5. The faculty coordinator will be student first point of contact for any queries.

6. Attendance Policy:

Although this is a non-credit course but attendance criteria is same as per the Institute policy and passing this is mandatory. Failure to do so will require a student need to repeat the course.

7. Assessment:

The assessment will be on the basis of the students' performance during their evaluation process:

- **Midterm Assessment: 10 marks**
- **Final Assessment: 40 marks**

The Relative grades will be awarded to the students on the basis of marks secured in the assessments.

Excellent
Very good
Good
Repeat

Expected Outcome: Students must actively engage with their chosen skill set to achieve a level where they can **showcase their progress or skill** in a group or individual setting.

8. Roles and Responsibilities:

a. Faculty Coordinators:

- The faculty coordinators will be responsible for conduction of classes and closely coordinate with students coordinators involved in training.
- Faculty coordinators will monitor the students' progress and mark attendance on MSERP. The faculty coordinator will be the first point of contact for any query of students.
- The faculty coordinator will be responsible for all assessments and uploading of Marks on MSERP.

b. Students Coordinator:

- The student coordinators will be responsible for training of students in the respective domain.
- The student coordinator will work in close coordination of Faculty coordinator of respective domain.

c. Overall Coordinator:

- The overall coordinator of Global Elective "self-growth" is Dean Student welfare, and will be responsible for smooth conduction of classes of all domain.
- Provide administrative support to the faculty coordinator, and student coordinator for smooth conduction of classes.
- He will be responsible for timely get Midterm/final assessment done and uploading of marks on MSERP of all domains by faculty coordinators.

Annexure-5

Standard Operating Procedure (SOP) for Conducting Foreign Language Classes

Even Semester 2024-25 | First-Year Students

The purpose of this SOP is to ensure the smooth execution of foreign language classes conducted through the Department of PR & International Relations for first-year students during the even semester of the academic year 2024-25. The procedure aims to standardize the scheduling, delivery, assessment, and overall management of these classes to enhance the linguistic capabilities of students.

This SOP applies to all the first-year students enrolled in the following courses/ branches –

1. CSE AI
2. CSE AI & ML
3. CS
4. ME
5. EEE
6. ELCE
7. MBA

I. Course Objective

The primary objective of introducing foreign languages as an elective subject was to provide students with:

1. To Develop basic listening, speaking, reading and writing proficiency in the target language, enabling global communication skills
2. To Foster an understanding of intercultural communication, particularly between Indian and target-language-speaking cultures.
3. Introduce students to the global significance of the target language and appreciate its culture & ethics in international contexts

II. Languages offered

S. No.	Language	Subject Name	Subject Code
1	JAPANESE	BASIC PROFICIENCY IN JAPANESE	HS103B
2	GERMAN	BASIC PROFICIENCY IN GERMAN	HS104B
3	FRENCH	BASIC PROFICIENCY IN FRENCH	HS105B
4	SPANISH	BASIC PROFICIENCY IN SPANISH	HS106B

III. Teaching Methodology

The language courses were structured with the following approach:

- Interactive classroom sessions.

- Audio-visual learning aids for better comprehension.
- Group discussions and Cultural exchange activities, like poster-making and role-playing exercises.

IV. Maximum Allotment of Seats on MSERP

S. No.	Subject Name	Capping on Seats on MSERP
1	BASIC PROFICIENCY IN JAPANESE	200
2	BASIC PROFICIENCY IN GERMAN	500
3	BASIC PROFICIENCY IN FRENCH	450
4	BASIC PROFICIENCY IN SPANISH	200

V. Batch-Wise Segregation of Students

As per our record, a total number of **1271 students** will be enrolled in Global Open Elective Subject (Foreign Languages) in the Even Semester 2024-25. To ensure optimal learning experiences, we have grouped these students into batches as follows:

S. No.	Course	Branch	No. of Students	Batch
1	B.Tech	CSE AIML	221	Batch 1
2	B.Tech	EEE	76	
3	B.Tech	CSE AI	292	Batch 2
4	B.Tech	ELCE	70	
5	B.Tech	CS	292	Batch 3
6	B.Tech	ME	68	
7	MBA	-	252	Batch 4

***Each batch will be divided into 4 sections**, one for each language with the maximum no. of seats mentioned in the table below.

VI. Class Schedule

S. No.	Subject Name	Subject Code	No. of Seats in one section	No. of Full-time/ Contractual Trainers Required	No. of Lectures per week per language
1	BASIC PROFICIENCY IN JAPANESE	HS103B	60	1 + 1	4
2	BASIC PROFICIENCY IN GERMAN	HS104B	120	1 + 1	4
3	BASIC PROFICIENCY IN FRENCH	HS105B	120	1 + 1	4
4	BASIC PROFICIENCY IN SPANISH	HS106B	120	1 + 1	4

VII. Attendance Policy:

- Minimum 75% attendance required.
- Students with genuine reasons for absence must inform the faculty in advance.

VIII. Evaluation and Assessment

- Periodic assessments (CA1, CA2, CA3) based on interactive activities.
- Assignments and presentations to encourage self-learning.
- MSE1 (Written + Poster-Making + Video Introduction) and MSE2 (Roleplay)

Marks Division

Total Marks - 100 marks

- MSE 1 – 40 MARKS
- MSE 2 – 40 MARKS
- CA – 20 MARKS

S. No.	Examination	Marks	Syllabus coverage	Mode of Assessment (Decentralized)	Duration
1	CA1	6	20%	Quiz	1 Hour
2	CA2	7	65%	Activity Based (International Food Festival / Karaoke & Music Sessions during IEAW 2025)	As per the timings of IEAW 2025
3	CA3	7	80%	Activity Based (Travel/ Daily Life Vlog or Podcast Creation)	-
4	MSE 1	40	50%	Written + Poster-Making + Video Introduction	1 Hour (Written) 2 Hours (Poster-Making)
5	MSE 2	40	100%	Practical (Roleplay)	6 Hours

(a) Rubrics/ Evaluation Criteria for International Food Festival

1. **Presentation & Explanation in the Foreign Language (2 Marks)**
   - **2:** Students explain their dish fluently with correct vocabulary, grammar, and pronunciation in the target language. They confidently describe the ingredients, cooking process, and cultural significance.
   - **1:** Students make some grammatical or pronunciation errors but can still communicate the key details.
   - **0:** The explanation is unclear, with frequent errors making it difficult to understand.

2. **Cultural Authenticity & Relevance (2 Marks)**
   - **2:** The dish is authentic and well-researched, accurately representing the cuisine of the chosen country.
   - **1:** The dish is somewhat related to the country's cuisine but lacks authenticity or cultural significance.
   - **0:** The dish does not represent the country's cuisine effectively.
3. **Taste & Presentation (2 Marks)**
   - **2:** The dish is visually appealing, well-prepared, and flavorful. It shows effort in plating and garnishing.
   - **1:** The dish is acceptable in taste and presentation but lacks refinement.
   - **0:** The dish is poorly prepared or unappealing in taste and presentation.

4. **Teamwork & Engagement (1 Mark)**
   - **1:** The group works collaboratively, engages with visitors, and enthusiastically presents their dish.
   - **0:** There is a lack of coordination or engagement in the presentation.

(b) Rubrics/ Evaluation Criteria for Karaoke & Music Sessions

1. **Pronunciation & Language Proficiency (2 Marks)**
   - **2:** Students sing with clear pronunciation, correct use of the foreign language, and minimal errors in lyrics.
   - **1:** Students make some errors in pronunciation or lyrics, but they do not significantly hinder comprehension.
   - **0:** Frequent errors in pronunciation or lyrics make the performance hard to follow.

5. **Musicality & Rhythm (2 Marks)**
   - **2:** Students maintain rhythm, pitch, and harmony throughout the performance, demonstrating strong musical ability.
   - **1:** Students attempt to follow rhythm and pitch but have some noticeable inconsistencies.
   - **0:** The performance lacks rhythm, pitch, or musical coherence.

6. **Cultural Relevance (1 Mark)**
   - **1:** The song choice reflects the musical culture of the target country and shows thoughtfulness in selection.
   - **0:** The song is not representative of the target country's culture or seems randomly chosen.

7. **Engagement & Stage Presence (1 Mark)**
    - **1:** The group demonstrates enthusiasm, confidence, and engages the audience effectively during their performance.
    - **0:** The group appears disengaged or lacks energy in their performance.

8. **Team Collaboration (1 Mark)**
    - **1:** The group works cohesively, showing strong coordination and shared effort in the performance.
    - **0:** There is a lack of coordination, and the group appears disorganized.

(c) Rubrics/ Evaluation Criteria for Travel/ Daily Life Vlog

1. **Language Proficiency & Pronunciation (2 Marks)**
    - **2:** The vlog features clear and fluent use of the foreign language, with correct grammar, vocabulary, and pronunciation.
    - **1:** The vlog includes some errors in grammar or pronunciation, but they do not significantly affect comprehension.
    - **0:** Frequent errors in language usage make it difficult to understand the vlog.

2. **Content Relevance & Creativity (2 Marks)**
    - **2:** The vlog is engaging, creative, and provides relevant insights about daily life or travel in the target country.
    - **1:** The vlog is somewhat relevant but lacks depth, creativity, or focus on the cultural aspect of the target country.
    - **0:** The vlog content is unclear, irrelevant, or lacks any connection to the task.

3. **Cultural Representation (1 Mark)**
    - **1:** The vlog reflects thoughtful inclusion of cultural elements, traditions, or locations from the target country.
    - **0:** The vlog lacks any cultural representation or connection to the target country.

4. **Technical Quality (1 Mark)**
    - **1:** The vlog has clear audio, good video quality, and smooth editing, enhancing the overall viewing experience.
    - **0:** The vlog suffers from poor video/audio quality or lacks basic editing.

5. **Team Collaboration & Presentation (1 Mark)**
    - **1:** The group demonstrates strong collaboration, with each member contributing effectively and confidently presenting in the vlog.
    - **0:** The group lacks coordination, and the presentation is disorganized or dominated by one member.

(d) Rubrics/ Evaluation Criteria for Podcast Creation

1. **Content & Relevance (2 Marks)**
    - **2:** The podcast is well-structured, informative, and engaging. The content is relevant to the given topic and demonstrates deep understanding.
    - **1:** The content is somewhat relevant but lacks clarity or depth. Some parts may be off-topic.
    - **0:** The content is unclear, irrelevant, or lacks coherence.

2. **Language Proficiency & Pronunciation (2 Marks)**
    - **2:** The student uses appropriate vocabulary, correct grammar, and clear pronunciation with minimal errors.
    - **1:** There are noticeable grammar or pronunciation errors, but the overall message is understandable.
    - **0:** Frequent errors in grammar, vocabulary, or pronunciation hinder understanding.

3. **Creativity & Engagement (1 Mark)**
    - **1**: The podcast is creative, engaging, and holds the listener's attention effectively.
    - **0:** The podcast lacks creativity and engagement, making it uninteresting to the listener.

4. **Technical Quality (1 Mark)**
    - **1**: The audio is clear, well-edited, and free from distracting noise.
    - **0:** The audio is unclear, poorly edited, or has distracting background noise.

5. **Team Collaboration & Presentation (1 Mark)**
    - **1:** The podcast demonstrates strong collaboration, with each member contributing effectively and confidently, while delivering dialogues or conversations during the podcast.
    - **0:** The overall presentation is disorganized and/or the podcast is dominated by one member only.

(e) Rubrics/ Evaluation Criteria for Roleplay

1. **Language Proficiency (10 Marks)**
    - **9-10:** Excellent use of vocabulary, grammar, and pronunciation; minimal errors that do not hinder communication.
    - **7-8:** Good use of language with some minor errors; overall communication is clear.
    - **5-6:** Satisfactory use of language but with noticeable errors in grammar or pronunciation that slightly affect comprehension.
    - **0-4:** Poor language use with frequent errors that hinder understanding.

2. **Content & Relevance (10 Marks)**
    - **9-10:** The roleplay is highly relevant, realistic, and well-aligned with the chosen real-life scenario from the target country.
    - **7-8:** The roleplay is mostly relevant and realistic, but some elements are inconsistent with the scenario.
    - **5-6:** The roleplay is somewhat relevant but lacks depth or accuracy in depicting the scenario.
    - **0-4:** The roleplay is unclear, irrelevant, or poorly aligned with the given task.

3. **Cultural Representation (8 Marks)**
    - **7-8:** Excellent inclusion of cultural elements (gestures, customs, traditions) from the target country; shows thorough research.
    - **5-6:** Good representation of cultural elements, but some aspects could be improved.
    - **3-4:** Basic cultural representation, but lacks depth or contains inaccuracies.
    - **0-2:** Minimal or no cultural elements included, or the representation is incorrect.

4. **Teamwork & Coordination (6 Marks)**
    - **6:** Outstanding collaboration, with each member contributing equally and showing strong coordination.
    - **4-5:** Good teamwork, with most members participating actively; some minor issues in coordination.
    - **2-3:** Uneven participation or noticeable lack of coordination among team members.
    - **0-1:** Poor teamwork, with minimal contribution from most team members or evident disorganization.

5. **Creativity & Engagement (4 Marks)**
    - **4:** Highly creative and engaging roleplay that captures the audience's attention.
    - **3:** Moderately creative and engaging, with some innovative elements.
    - **2:** Somewhat creative, but lacks originality or fails to sustain engagement.
    - **0-1:** Lacks creativity and is unengaging.

6. **Presentation & Fluency (2 Marks)**
    - **2:** The performance is smooth, confident, and well-rehearsed.
    - **1:** The performance is somewhat confident but includes noticeable pauses or hesitation.
    - **0:** The performance is unprepared or hesitant, with frequent disruptions.

IX. Course Outcome

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

- Understand how language and culture interact in global context and impact intercultural communication
- Introduce themselves in the respective language and understand the syllables and number
- Apply their learning in basic conversations and understand the social etiquette of professional world
- Utilize the skills of listening, speaking and non-verbal communication in the target language

X. CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	**1**	**3**	-	**1**
CO2	-	-	-	-	-	-	-	-	**1**	**3**	-	**1**
CO3	-	-	-	-	-	-	-	-	**1**	**3**	-	**1**
CO4	-	-	-	-	-	-	-	-	**1**	**3**	-	1

XI. Roles and Responsibilities

(a) Academic Coordinator (Foreign Languages)

- Coordinate with faculty for syllabus completion, assessment, attendance update on MSERP.
- Queries related to foreign language course content, class schedule, MSERP etc. from the faculty members, departmental coordinators and students can be directed to the Academic Coordinator via official communication channels.
- Coordinate with Head PR&IR for planning and execution of all the activities/ tasks pertaining to foreign language classes.

(b) MSERP Coordinator

- Upload the list of students in different sections
- Coordinate with ERP Team for all ERP-related tasks

(c) Foreign Language Trainers

- Deliver structured lessons as per the syllabus
- Conduct regular assessments and provide feedback
- Maintain attendance and participation records
- provide study materials to the students
- Upload daily attendance of classes on MSERP. Maintain the attendance in hard copies as well
- Draft question papers, evaluate the answer sheets, and upload the marks on MSERP

XII. Support for Gradual Learners

Based on the academic performance in MSE 1, we shall identify the slow learners and ensure that they pace up their learning skills, through the following –

- Encourage them to use Language Learning Apps, such as Duolingo for self-practice
- Pair them with high performers in the class for peer support
- Suggest them to watch interactive Videos & Podcasts with subtitles to understand the flow of speech and sentence structure
- Encourage a ‘mistake-free’ environment in the class to ensure no one feels embarrassed or hesitant while speaking in the target language.

Annexure-6

Distribution of departments in Groups for Autonomous Session 2024-2025

Group A	No. of sections	Group B	No. of sections
CSE	5	CSE(AIML)	3
IT	3	ME	1
CSIT	3	EEE	1
ECE	3	ELCE	1
		CS	4
		CSE(AI)	4
Total	**14**	**Total**	**14**

Group-A (CSE/IT/CSIT/ECE)			
Semester-I			
S. No.	**Name of Theory Courses**	**S. No.**	**Name of Practical Courses**
1	Calculus for Engineers	1	Programming for Problem Solving Lab
2	Environmental Chemistry	2	Computer Organization & Logic Design Lab
3	Programming for Problem Solving	3	Design & Realization Lab
4	Design & Realization	4	Web Designing (CSE/IT/CSIT)
5	Design Thinking	5	Foreign Language
6	Computer Organization & Logic Design	6	Indian Knowledge System
7	Intelligent Health Care Systems (ECE)	7	Intelligent Health Care Systems Lab (ECE)
Semester-II			
S. No.	**Name of Theory Courses**	**S. No.**	**Name of Practical Courses**
1	Linear Algebra for Engineers	1	Semiconductor Physics and Devices Lab
2	Semiconductor Physics and Devices	2	IoT and Embedded Systems Lab
3	Data Structure	3	Python for Engineers
4	Discrete Structures & Theory of Logic (CSE/CSIT/IT) /Explorations in Electrical Engineering (ECE)	4	Communication Skills
5	IoT and Embedded Systems	5	Innovation and Entrepreneurship
		6	Self-Growth

Group-B (CS/CSE(AI)/CSE(AIML)/ME/EEE/ELCE)			
Semester-I			
S. No.	**Name of Theory Courses**	**S. No.**	**Name of Practical Courses**
1	Calculus for Engineers	1	Semiconductor Physics and Devices Lab
2	Semiconductor Physics and Devices	2	Programming For Problem Solving Lab
3	Programming for Problem Solving	3	IoT and Embedded Systems Lab
4	Discrete Structures & Theory of Logic (CS/CSE(AI)/CSE(AIML))/ Explorations in Electrical Engineering (ME/ELCE/EEE)	4	Web Designing (CS/CSE(AI)/CSE(AIML)) /Explorations in Electrical Engineering Lab (ME/ELCE/EEE)
5	Design Thinking	5	Communication Skills
6	IoT and Embedded Systems	6	Self-Growth
Semester-II			
S. No.	**Name of Theory Courses**	**S. No.**	**Name of Practical Courses**
1	Linear Algebra for Engineers (CS/CSE(AI)/CSE(AIML)/EEE/ELCE)/ Differential Equation & Complex Integration (ME)	1	Computer Organization & Logic Design Lab (CS/CSE(AI)/CSE(AIML)/ELCE)/Emerging Technologies for Engineers Lab (ME/EEE)
2	Environmental Chemistry	2	Design & Realization Lab (CS/ME/ELCE/EEE)
3	Data Structure	3	Python for Engineers
4	Computer Organization & Logic Design (CS/CSE(AI)/CSE(AIML)/ELCE)/Emerging Technologies for Engineers (ME/EEE)	4	Electrical Engineering Workshop (ELCE)
5	Design & Realization (CS/ME/ELCE/EEE)/Introduction to AI (CSE(AI)/CSE(AIML))	5	Foreign Language
6	Digital Logic Design (EEE)	6	Indian Knowledge System
7	Engineering Mechanics (ME)	7	Innovation and Entrepreneurship