ABOUT THE DEPARTMENT

In the changing environment era 21st century, the role of E&TC engineers is very vital. Today the world has become the global village due to the contribution of E&TC Engineers. The department of E&TC Arvind Gavali College of Engineering understands the importance of training Engineering students according to the present needs in the competitive world. The department has well experienced and qualified faculty with expertise in Image Processing, Wireless Networks, Microsystems, Instrumentation, Communication systems Embedded Systems and Micro-controller, etc. The department has an E-TESA organization that conducts various Workshops, Guest Lectures, and Technical Events. Finally, we take this opportunity to mention that we teaching and non-teaching staff together continues to work as a team that is committed to flourishing the department day by day towards and the ultimate goal of achieving excellence in all aspects of departments.

DEPARTMENT VISION

To be one of the leading Electronics and Telecommunication Engineering Department engaged in quality education to solve industrial and social problems.

DEPARTMENT MISSION

M1	To enrich academic competency by imparting quality education.
M2	To nurture skills among the students helping them succeed and progress in their personal and professional career.
M3	To instill sensitivity towards society and respect for the environment.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

Graduates will be able to :

PEO 1	The graduates will be able to apply the basic concepts of mathematics, sciences, engineering to solve industrial and societal problems.
PEO 2	The graduates will be able to deal with complex real time problems by applying technical and soft skills.
PEO 3	The graduates will be able to develop awareness towards ethical, societal & environmental issues

PROGRAM OUTCOMES (PO)

PO 1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization to develop to the solution of complex engineering problems.
PO 2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development.
PO 3	**Design/Development of Solutions**: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO 4	**Conduct Investigations of Complex Problems**: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8)
PO 5	**Engineering Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO 6	**The Engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO 7	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO 8	**Individual and Collaborative Team work:** Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO 9	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO 10	**Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO 11	**Life-Long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

PROGRAM SPECIFIC OUTCOMES (PSO)

Students will be able to :

PSO 1	Students will be able to analyse and design the electronics and telecommunication systems by understanding and applying the fundamental knowledge.
PSO 2	Students will be able to contribute to projects in the core and associated domain by using modern tools like PCB design, embedded programming, etc.

MAPPING OF PEO'S TO PO'S

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

MAPPING OF PEO's TO PSO's

	PSO 1	PSO2
PEO 1	3	2
PEO 2	2	2
PEO 3	2	3

A. Definition of Credit:

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

B. Range of Credits:

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

C. Structure & Definition:

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

D. Credit Framework:

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

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

LEVEL	QUALIFICATION TITLE	CREDIT REQUIREMENTS		SEMESTER	YEAR
		MINMUM	MAXIMUM		
6.0	4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg./ Tech. with Multidisciplinary Minor	160	176	8	4
6.0	4-Years Bachelor's degree (B.E./ B.Tech. or Equivalent) in Engg./ Tech. – Honors and Multidisciplinary Minor	180	194	8	4

E. Structure Categories of UG Program:

SR. NO.	YEAR	FY		SY		TY		B. TECH			
	SEMESTER	I	II	III	IV	V	VI	VII	VIII	ACTUAL	NEP GUIDE LINES
1	Basic Science Course	8	8							16	14-18
2	Engineering Science Course	7	5							12	16-12
3	Program Core Courses		2	13	15	11	9	7		57	44-56
4	Program Elective Course					4	8	7		19	20
5	Multi Minor			3	3	2	3	3		14	14
6	Open Elective			2	3	3				8	8
7	Vocational and Skill Enhancement Course	1	4							5	8
8	Ability Enhancement Course	3			1					4	4
9	Entrepreneurship /Economics/ Management Courses (Mgt./Economics/Mkt./Finance)								3	3	4
10	Indian Knowledge System		2							2	2
11	Value Education Course			1	1					2	4
12	Research Methodology (Project)								4	4	4
13	Common Egg. Project/Field Project (PBL/Seminar/Mini Project)			1						1	2
14	Project							4		4	4
15	Internship/OJT (PBL/Seminar/Mini Project/Virtual Internship/Physical)								12	12	12
16	Co-curricular Courses	1	1							2	4
	Total Credits	**20**	**22**	**20**	**23**	**20**	**20**	**21**	**19**	**165**	
	Examination Total	**900**	**900**	**900**	**950**	**850**	**750**	**750**	**300**	**6300**	
	Total Working Hours/Week	**26**	**27**	**24**	**27**	**26**	**25**	**26**	**37**	**218**	
NEP Guidelines		**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**	**20-22**		**160-176**

F. Semester wise credit distribution:

First Year B. Tech (Common for all Branches) **SEMESTER I**

SR. NO	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	HRS. /WEEK	CR	COMPONENTS		MIN FOR PASSING	
1	BSC	25BSE1101	Engineering Mathematics: Calculus and Algebraic Techniques	3	1	0	4	4	CA1 MSE CA2 ESE	15 20 15 50	 20	40
2	BSC	25BSE1001/ 25BSE1002	Engineering Physics/ Modern Chemistry	3	0	0	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
3	ESC	25BSE1102	Basic Electrical & Electronics Engineering	3	0	0	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
4	ESC	25BSE1103	C Programming for Problem Solving	2	0	0	2	2	CA1 MSE CA2 ESE	15 20 15 50	 20	40
5	AEC	25BSE1104	Communication Skills	2	0	0	2	2	CA1 MSE CA2 ESE	15 20 15 50	 20	40
6	BSC	25BSE1001L / 25BSE1002L	Engineering Physics Laboratory/ Modern Chemistry Laboratory	0	0	2	2	1	CA1 CA2 OE	25 25 --	 --	20
7	ESC	25BSE1102L	Basic Electrical & Electronics Engineering Laboratory	0	0	2	2	1	CA1 CA2 OE	25 25 50	 20	40
8	ESC	25BSE1103L	C Programming for Problem Solving Laboratory	0	0	2	2	1	CA1 CA2 POE	25 25 50	 20	40
9	AEC	25BSE1104L	Communication Skills Laboratory	0	0	2	2	1	CA1 CA2 OE	25 25 --	 --	20
10	VSEC	25BSE1105L	Engineering Practice Laboratory	0	0	2	2	1	CA1 CA2 OE	25 25 --	 --	20
11	CC	25BSE1106L	Yoga	0	0	2	2	1	CA1 CA2 OE	25 25 --	 --	20
			Total	**13**	**1**	**12**	**26**	**20**		**900**		
Total Contact hours 26 Hrs Total credit 20												

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• Address :-At.Panmalewadi, Post.-Varye, Tal.& Dist.-Satara.-415 015 (Maharashtra)
• Phone : 02162 - 261122 , 200100
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First Year B. Tech (Common for all Branches) **SEMESTER II**

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	HR/ WEEK	CR	COMPONENTS	MAX	MIN FOR PASSING	
1	BSC	25BSE1201	Engineering Mathematics: Calculus and Transform Methods	3	1	0	4	4	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	BSC	25BSE1001/ 25BSE1002	Engineering Physics/Modern Chemistry	3	0	0	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	ESC	25BSE1202	Engineering Mechanics	2	0	0	2	2	CA1	10		40
									MSE	30		
									CA2	10		
									ESE	50	20	
4	ESC	25BSE1203	Python Programming	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	VSEC	25BSE1204	Computer Aided Engineering Drawing	2	0	0	2	2	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
6	PCC	25PCC1201	Fundamental of Industry Evolution	2	0	0	2	2	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	IKS	25BSE1205	Energy, Ecology & Environment	2	0	0	2	2	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
8	BSC	25BSE1001L/ 25BSE1002L	Engineering Physics Laboratory / Modern Chemistry Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
9	ESC	25BSE1203L	Python Programming Laboratory	0	0	2	2	1	CA1	25		40
									CA2	25		
									OE	50	20	
10	VSEC	25BSE1204L	Computer Aided Engineering Drawing Laboratory	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
11	VSEC	25BSE1205L	Design Thinking	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
12	CC	25BSE1206L	Community Services	0	0	2	2	1	CA1	25		20
									CA2	25		
									OE	--	--	
			Total	**16**	**1**	**10**	**27**	**22**		**900**		
Total Contact hours 27 Hrs Total credit 22												

*** Note: Students must complete a two-week internship after the semester, which will be evaluated in the following semester.**

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Second Year B. Tech **SEMESTER III**

Sr. No.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P		CR	COMPONANTS	MAX	MIN FOR PASSING	
1	PCC	25ETC2301	Differential Equations and Integral Transforms	2	--	--	2	2	CA1 MSE CA2 ESE	15 20 15 50	 20	40
2	PCC	25ETC2302	Electronics Devices and Circuits	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
3	PCC	25ETC2303	Digital Electronics	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
4	PCC	25ETC2304	Analog Communication	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
5	*OE	25OE23XX	Open Elective I	2	--	--	2	2	CA1 MSE CA2 ESE	15 20 15 50	 20	40
6	#MDM	25MMXXX2301	Multidisciplinary Minor-I	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
7	VEC	25VEC2002	Universal Human Values	1	--	--	1	1	CA1 MSE CA2 ESE	25 -- 25 --	 --	20
8	PCC	25ETC2302L	Electronics Devices and Circuits Laboratory	--	--	2	2	1	CA1 CA2 POE	25 25 50	 20	40
9	PCC	25ETC2303L	Digital Electronics Laboratory	--	--	2	2	1	CA1 CA2 POE	25 25 50	 20	40
10	CEP	25ETC2305L	Technical Seminar	--	--	2	2	1	CA1 CA2 POE	25 25 --	 --	20
11	Internship	25ETC2306L	Field Training / Internship /Industrial Training Evaluation	--	--	--	--	AU	---	---	---	
Total				**18**	**--**	**06**	**24**	**20**		**900**		

Open Elective Course – I (OE-I)

Sr. No	Course Code	Course Name
1.	25OE2301	Enhancing Soft Skill and Personality
2.	25OE2302	Ethics in Engineering Practices
3.	25OE2303	Introduction to Project Management

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Second Year B. Tech SEMESTER IV

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	Hrs./Week	CR	COMPONANTS	MAX	MIN FOR PASSING	
1	PCC	25ETC2401	Digital Communication	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ETC2402	Signals and Systems	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PCC	25ETC2403	Microcontroller and applications	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PCC	25ETC2404	Linear Integrated Circuit	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	*OE	25OE24XX	Open Elective II	3	--	--	3	3	CA1	25		40
									CA2	25		
									ESE	50	20	
6	#MDM	25MMXXX 240 1	Multidisciplinary Minor-II	3	--		3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
7	VEC	25VEC2001	Constitution of India	1	--	--	1	1	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
8	AEC	25AEC2001	Modern Language	1	--	--	1	1	CA1	25		20
									MSE	--		
									CA2	25		
									ESE	--	--	
9	PCC	25ETC2402L	Signals and Systems Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
10	PCC	25ETC2403L	Microcontroller and application Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
11	PCC	25ETC2404L	Linear Integrated Circuit Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
TOTAL				**20**	**--**	**6**	**26**	**23**		**950**		

Open Elective Course – II (OE-II)

Sr. No	Course Code	Course Name
1.	25OE2401	Business Communication
2.	25OE2402	E-Business
3.	25OE2403	Intellectual Property Rights

*** Note: Students must complete a two-week internship after the semester, which will be evaluated in the following semester.**

Third Year B. Tech **SEMESTER V**

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	Hrs./ Week	CR	COMPONANTS	MAX	MIN FOR PASSING	
1	PCC	25ETC3501	Antennas, Waves and Electromagnetic Theory	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
2	PCC	25ETC3502	Control Systems	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
3	PCC	25ETC3503	Digital Signal Processing	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
4	PEC	25PEETC35XX	Program Elective - I	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
5	*OE	25OE35XX	Open Elective III	3	--	--	3	3	CA1 MSE CA2 ESE	15 20 15 50	 20	40
6	#MDM	25MMETC3501	Multidisciplinary Minor-III	2	--	--	2	2	CA1 MSE CA2 ESE	15 20 15 50	 20	40
7	PCC	25ETC3501L	Antennas, Waves and Electromagnetic Theory Laboratory	--	--	2	2	1	CA1 CA2 POE	25 25 50	 20	40
8	PCC	25ETC3503L	Digital Signal Processing Laboratory	--	--	2	2	1	CA1 CA2 POE	25 25 50	 20	40
9	PEC	25ETC3504L	Program Elective –I Laboratory	--	--	2	2	1	CA1 CA2 POE	25 25 --	 --	20
12	Internship	25ETC3506L	FT/Internship/Indus trial Training					AU	---	--	--	---
TOTAL				**18**	**--**	**8**	**26**	**20**		**850**		

Program Elective Course – I (PEC-I):

Sr. No	Course Code	Course Name
1.	25PEETC3501	Optical Fiber communication
2.	25PEETC3502	Probability Theory and Stochastic Processes
3.	25PEETC3503	Computer Architecture & Organization

Open Elective Course – III (OE-III)

Sr. No	Course Code	Course Name
1.	25OE3501	Employability and Skill Development
2.	25OE3502	Business fundamentals for entrepreneurs
3.	25OE3503	Patent law for engineers

Third Year B. Tech **SEMESTER VI**

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	Hrs./Week	CR	COMPONANTS	MAX	MIN FOR PASSING	
1	PCC	25ETC3601	VLSI System Design	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ETC3602	Embedded Systems	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PEC	25PEETC36XX	Program Elective-II	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PEC	25PEETC36XX	Program Elective-III	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	#MDM	25MMETC36XX	Multidisciplinary Minor-IV	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	PCC	25ETC3601L	VLSI System Design Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
7	PCC	25ETC3602L	Embedded Systems Laboratory	--	--	4	4	2	CA1	25		40
									CA2	25		
									OE	50	20	
8	PEC	25ETC3603L	Program Elective-II Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
9	PEC	25ETC3604L	Program Elective-III Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
TOTAL				**15**	**0**	**10**	**25**	**20**		**750**		

Program Elective Course – II (PEC-II):

Sr. No	Course Code	Course Name
1.	25PEETC3601	5G Communication Systems
2.	25PEETC3602	Electronic System Design
3.	25PEETC3603	Computer Network

Program Elective Course – III (PEC-III):

Sr. No	Course Code	Course Name
1.	25PEETC3604	Information Theory & coding
2	25PEETC3605	Mechatronics
3	25PEETC3606	Cryptography & Network Security

*** Note: Students must complete a two-week internship after the semester, which will be evaluated in the following semester.**

Final Year B. Tech **SEMESTER VII**

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	Hrs./ Week	CR	COMPONANTS	MAX	MIN FOR PASSING	
1	PCC	25ETC4701	Mobile Communication	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	PCC	25ETC4702	RF & Microwave Engineering	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	PEC	25PEETC47XX	Program Elective - IV	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
4	PEC	25PEETC47XX	Program Elective - V	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
5	#MDM	25MMXXX47XX	Multidisciplinary Minor-V	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
6	PCC	25ETC4701L	Mobile Communication Laboratory	--	--	2	2	1	CA1	25		40
									CA2	25		
									POE	50	20	
7	CEP	25ETC4702L	Mini Project	--	--	8	8	4	CA1	25		40
									CA2	25		
									POE	50	20	
8	PEC	25ETC4704L	Program Elective - IV Laboratory	--	--	2	2	1	CA1	25		20
									CA2	25		
									POE	--	--	
9	Internship	25ETC4705L	FT/Internship/Industrial Training	--	--	--	--	AU	--	--	--	--
TOTAL				**15**	**0**	**12**	**27**	**21**		**750**		

Program Elective Course – IV (PEC-IV):

Sr. No	Course Code	Course Name
1.	25PEETC4701	Satellite Communication
2.	25PEETC4702	Mobile Computing
3.	25PEETC4703	Wireless Sensor Networks

Program Elective Course – V (PEC-V):

Sr. No	Course Code	Course Name
1.	25PEETC4704	Advance Mobile communication
2.	25PEETC4705	Soft Computing
3	25PEETC4706	Cyber Security

Final Year B. Tech **SEMESTER VIII**

SR. NO.	CATEGORY	COURSE CODE	COURSE NAME	TEACHING SCHEME					EVALUATION SCHEME			
				L	T	P	Hrs./ Week	CR	COMPONANTS	MAX	MIN FOR PASSING	
1	HSSM	25HSM4801	Finance Management	3	--	--	3	3	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
2	ELC	25ELC4801	Research Methodology	4	--	--	4	4	CA1	15		40
									MSE	20		
									CA2	15		
									ESE	50	20	
3	ELC	25ETC4801	Industrial Internship / Research Internship	--		--	30	12	CA	50		40
									OE	50	20	
Total				**7**	**--**	**--**	**37**	**19**		**300**		

G. Category wise Credit Distribution

PCC: PROGRAM CORE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25PCC1201	Fundamentals of Industry Evolution	2	--	--	2	2
2.	25ETC2301	Differential Equations & Integral Transforms	2	--	--	2	2
3.	25ETC2302	Electronics Devices and Circuits	3	--	2	5	4
4.	25ETC2303	Digital Electronics	3	--	2	5	4
5.	25ETC2304	Analog Communication	3	--	--	3	3
6.	25ETC2401	Digital Communication	3	--	--	3	3
7.	25ETC2402	Signals and Systems	3	--	2	5	4
8.	25ETC2403	Microcontroller and applications	3	--	2	5	4
9.	25ETC2404	Linear Integrated Circuit	3	--	2	5	4
10.	25ETC3501	Antennas, Waves and Electromagnetic Theory	3	--	2	5	4
11.	25ETC3502	Control Systems	3	--	--	3	3
12.	25ETC3503	Digital Signal Processing	3	--	2	5	4
13.	25ETC3601	VLSI System Design	3	--	2	5	4
14.	25ETC3602	Embedded Systems	3	--	2	5	4
15.	25ETC4701	Mobile Communication	3	--	2	5	4
16.	25ETC4702	Broadband Engineering	3	--	2	5	4
17.	25ETC4703	RF & Microwave Engineering	3	--	2	5	4
Total			**47**	--	**24**	**71**	**59**

PEC: PROGRAM ELECTIVE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ETCPE13501	Optical Fiber communication	3	--	2	5	4
2.	25ETCPE13502	Probability Theory and Stochastic Processes					
3.	25ETCPE13503	Computer Architecture & Organization					
4.	25ETCPE23601	5G Communication Systems	3	--	2	5	4
5.	25ETCPE23602	Electronic System Design					
6.	25ETCPE23603	Computer Network					
7.	25ETCPE33601	Information Theory & coding	3	--	2	5	4
8.	25ETCPE33602	Mechatronics					
9.	25ETCPE33603	Cryptography & Network Security					
10.	25ETCPE44701	Satellite Communication	3	--	2	5	4
11.	25ETCPE44702	Mobile Computing					
12.	25ETCPE44703	Wireless Sensor Networks					
13.	25ETCPE54701	Advance Mobile communication	3	--	--	3	3
14.	25ETCPE54702	Soft Computing					
15.	25ETCPE54703	Cyber Security					
Total			**15**	**--**	**8**	**23**	**19**

OEC: OPEN ELECTIVE COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25OE2301	Enhancing Soft Skill and Personality	3	--	--	3	3
2.	25OE2302	Ethics in Engineering Practices					
3.	25OE2303	Introduction to Project Management					
4.	25OE2401	Indian Writing in English	2	--	--	2	2
5.	25OE2402	E-Business					
6.	25OE2403	Intellectual Property					
7.	25OE2501	Employability and Skills Development	3	--	--	3	3
8.	25OE2502	Business Fundamentals for Entrepreneurs					
9.	25OE2503	Patent law for engineers and scientists					
Total			**8**	**--**	**--**	**8**	**8**

VSEC:VOCATIONAL AND SKILL ENHANCEMENT COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25BSE1105L	Engineering Practice Laboratory	--	--	2	2	1
2.	25BSE1204	Computer Aided Engineering Drawing	2	--	2	4	3
3.	25BSE1205L	Design Thinking	--	--	2	2	1
4.	25ETC2405L	Mini Project 1	--	--	2	2	1
5.	25ETC3505P	Mini Project-II	--	--	2	2	1
Total			**2**	**--**	**10**	**12**	**7**

HUMANITIES SOCIAL SCIENCE AND MANAGEMENT COURSES

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25BSE1104	Communication Skills	1	--	2	3	3
2.	25BSE1205	Ecology, Energy & Environment	2	--	--	2	2
3.	25HS2301	Finance Management	1	--	--	1	1
4.	25VEC2001	Constitution of India	1	--	--	1	1
5.	25VEC2002	Universal Human Values	1	--	--	1	1
6.	25AEC2401	Modern Language	1	--	--	1	1
Total			**7**	**--**	**2**	**9**	**8**

EXPERIENTIAL LEARNING

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ETC2305P	Mini project - I	--	--	2	2	1
2.	25ETC2405	Seminar-I	--	--	2	2	1
3.	25ETC3505P	Mini project - II	--	--	2	2	1
4.	25ETC3604	Seminar-II	--	--	2	2	1
5.	25ETC4803	Industrial Internship / Research Internship/ Major Project	--	--	30	30	12
Total			**--**	**--**	**38**	**38**	**16**

H. Multi-Disciplinary Minor Courses (MDM): Offered by Electronics and Telecommunication Department

Sr. No.	Course Code	Semester	Course Name	L	T	P	Hrs. / Week	Credits
1.	25MMETC2301	III	Digital Electronics & Micropressor	3	--	--	3	3
2.	25MMETC2401	IV	Fundamental of Embedded Systems	3	--		3	3
3.	25MMETC3501	V	Microcontrollers & Interfacing	2	-	1	3	3
4.	25MMETC3601	VI	IoT Archictures & Protocols	2	--	--	2	2
5.	25MMETC4701	VII	IOT Application Development using cloud and AI	3	--	--	3	3
			Total	**13**	**--**	**1**	**14**	**14**

Multi-Disciplinary Minor : MDM Courses offered by Mechanical Department (Mechatronics)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMMEC2301	Introduction of Mechatronics	3	--	--	3	3
2.	25MMMEC2401	Design of Mechatronics	2	--	--	2	2
3.	25MMMEC3501	Sensor technology	3	--	--	3	3
4.	25MMMEC3601	Mechatronics in Automotive System	3	--	--	3	3
5.	25MMMEC4701	Industrial Automation	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

Multi-Disciplinary Minor : MDM Courses offered by AI & DS Department (Data Science)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMADS2301	Statistics for Engineers	3	--	--	3	3
2.	25MMADS2401	Data Analytics & Visualisation	2	--	--	2	2
3.	25MMADS3501	Fundamentals of Artificial Intelligence	3	--	--	3	3
4.	25MMADS3601	Machine Learning & Algorithms	3	--	--	3	3
5.	25MMADS4701	Prompt Engineering	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

Multi-Displinary Minor MDM: Courses offered by ELE Department (Minor in IOT & Its Application)

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

Multi-Displinary Minor MDM: Courses offered by ECE Department (Minor in Full Stack Development)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMECE2301	Introduction to web Development	3	--	--	3	3
2.	25MMECE2401	Front End development React JS	2	--	--	2	2
3.	25MMECE3501	Backend Development with Node Js & express JS	3	--	--	3	3
4.	25MMECE3601	Database Management with MongoDB	3	--	--	3	3
5.	25MMECE4701	Cloud Deployment for MERN Application	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

Multi-Displinary Minor MDM: Courses offered by CSE Department (Minor in Full Stack Development)

Sr. No.	Course Code	Course Name	L	T	P	H./ W	Credits
1.	25MMCSE2301	Data Structure and Algorithms	3	--	--	3	3
2.	25MMCSE2401	Mastering Object Oriented Programming	2	--	--	2	2
3.	25MMCSE3501	Database engineering & Distributed System	3	--	--	3	3
4.	25MMCSE3601	Machine Learning & Its Applications	3	--	--	3	3
5.	25MMCSE4701	Deep Learning and Applied Generative AI	3	--	--	3	3
Total			**14**	**--**	**--**	**14**	**14**

I. Exit Courses:

EXIT COURSE AFTER FIRST YEAR: ONE YEAR UG DIPLOMA IN E & TC Engineering

	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs.		Components	Max	Min for Passing	
1	VSEC	25ETCEX101	Applied Electronics Engineering	--	--	4	4	2	CA1	25	--	
									MSE	--		
									CA2	25		
									ESE	--	--	
2	VSEC	25ETCEX102	Electronic Product Development	--	--	4	4	2	CA1	25	--	
									MSE	--		
									CA2	25		
									ESE	--	--	
3	ELC	25ETCEX103	Industrial Internship / Field Training	--	--	8	8	4	CA1	25	--	
									CA2	25		
									POE	--		
Total				--	--	16	18	8		150		

EXIT COURSE AFTER SECOND YEAR: TWO YEAR UG DIPLOMA IN E & TC Engineering

	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T	P	Hrs.		Components	Max	Min for Passing	
1	VSEC	25ETCEX201	Microprocessor & Embedded Programming	--	--	4	4	2	CA1	25	--	
									MSE	--		
									CA2	25		
									ESE	--	--	
2	VSEC	25ETCEX202	Signal Processing & Analysis	--	--	4	4	2	CA1	25	--	
									MSE	--		
									CA2	25		
									ESE	--	--	
3	ELC	25ETCEX203	Internship	--	--	8	8	4	CA1	25	--	
									CA2	25		
									POE	--		
Total				--	--	16	18	8		150		

EXIT COURSE AFTER THIRD YEAR: THIRD YEAR BACHELOR'S DEGREE IN VOCATION (B.VOC) IN E & TC Engineering

Sr. no	Category	Course Code	Course Name	Teaching Scheme					Evaluation Scheme			
				L	T		P Hrs		Components	Max	Min for Passing	
1	VSEC	25ETCX301	Digital Image Processing & Applications	--	--	8	8	4	CA1	25	--	40
									CA2	25		
									ESE	50	20	
2	VSEC	25ETCX302	Industrial Electronics & Automation	2	--	2	4	3	CA1	25	--	40
									MSE	--		
									CA2	25		
									ESE	50	20	
3	ELC	25E		--	--	8	8	4	CA1	25	--	--
									CA1	25		
									POE	--		
Total				**2**	**--**	**18**	**20**	**11**		**150**		

J. Emerging/Minor Degree: Electronics and Telecommunication (Computer Vision and Intelligent Imaging)

Sr. No.	Course Code	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ETCEM001	Probability and Statistics for AI Systems	3	1	0	4	4
2.	25ETCEM002	Linear Algebra for Vision Applications	3	1	0	4	4
3	25ETCEM003	Signals and Image Processing	3	1	0	4	4
4.	25ETCEM004	Machine Learning for Vision Systems	3	1	0	4	4
5	25ETCEM005	Computer Vision	2	0	0	2	2
Total			**18**	**4**	**0**	**22**	**18**

K. Honors Degree: Electronics and Telecommunication B. Tech (AI and Edge Computing for Embedded Systems)

Sr. No.	Course Code	Semester	Course Name	L	T	P	Hrs. / Week	Credits
1.	25ETCHS001	III	Python for Embedded AI	3	1	--	4	4
2.	25ETCHS002	IV	Edge AI and TinyML	3	1	--	4	4
3.	25ETCHS003	V	Computer Vision for Embedded Systems	3	1	--	4	4
4.	25ETCHS004	VI	Edge Computing and IoT Analytics	3	1	--	4	4
5.	25ETCHS005	VII	Embedded Systems Capstone Project	--	--	4	4	2
			Total	**12**	**4**	**4**	**20**	**18**

Title of the Course: Differential Equations and Integral Transforms	**L**	**T**	**P**	**Credit**
Course Code: 25ETC2301	**2**	**--**	**-**	**2**

Course pre-requisite: This course requires the basic knowledge of the following:
1. Basic Calculus (Differentiation & Integration)
2. Ordinary Differential Equations

Course Description:
This course covers solution methods of linear differential equations**,** Laplace and inverse Laplace transform**s**, and Z-transform for discrete-time signal analysis. It also includes Fourier Series and Fourier Transform for representing and analysing signals in time and frequency domains, with applications in engineering and communication systems.

Course Objectives:
1. To develop understanding of methods for solving linear differential equations with constant coefficients.
2. To apply Laplace and inverse Laplace transforms in solving differential equations.
3. To understand Fourier series, Fourier Transform and inverse Fourier Transform of standard signals and represent periodic functions mathematically.
4. To analyse discrete-time systems using Z-transform and its properties.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Solve linear differential equations using complementary function, particular integral, and variation of parameters.
CO2	Apply inverse Laplace transform techniques to solve differential equations.
CO3	Apply Fourier series techniques to represent and compute periodic functions and Fourier transform techniques for frequency spectrum analysis in engineering and communication systems
CO4	Analyse discrete-time signals and systems using Z-transform and ROC.

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Linear Differential Equations with Constant Coefficients:** Introductory remarks - complementary function, particular integral; Rules for finding complementary functions and particular integrals; Method of variation of parameters; Cauchy 's homogeneous and Legendre's linear equations	7
2.	**Inverse Laplace Transforms:** Inverse Laplace transforms, Inverse Laplace transforms by using partial fractions and convolution theorem, transforms of periodic functions and Heaviside unit step function, Solution of linear differential equations with constant coefficients by Laplace transform method	7
3.	**Fourier Series and advanced Fourier Transform:** Definition, Euler's formulae, Dirichlet's conditions, functions having points of discontinuity, Change of interval, Expansion of odd and even periodic functions, Half range series, introduction to Fourier Transform, Basic conditions for existence, Fourier Transform of standard signals, Properties (linearity, shifting)	7
4	**Discrete-Time Signal Analysis using Z-Transform:** Introduction to Z-transform (unilateral & bilateral), Region of Convergenc and its role in stability and causality, Properties of Z-transform (linearity, shifting, scaling, convolution, etc.), Z-transform of standard discrete-time signals, Methods of inverse Z-transform, System analysis using Z-transform and difference equations	7

Text Books			
Sr. No	**Title**	**Author**	**Publisher**
1	Higher Engineering Mathematics	Dr. B. S. Grewal	Khanna Publishers, Delhi
2	A Text Book of Applied Mathematics (Vol. I, II, III)	P. N. Wartikar & J. N. Wartikar	Pune Vidyarthi Griha Prakashan, Pune

Reference Books			
1	A Text Book of Engineering Mathematics	N. P. Bali & Manish Goyal (Iyengar)	Laxmi Publications (P) Ltd., New Delhi
2	Advanced Engineering Mathematics	H. K. Dass	S. Chand, New Delhi.
3	Advanced Engineering Mathematics	Erwin Kreyszig	Wiley India Pvt. Ltd.

Title of the Course: Electronic Devices and Circuits	**L**	**T**	**P**	**Credit**
Course Code: 25ETC2302	**3**	**--**	**--**	**3**

Course Pre-Requisite:

1. Semiconductor Physics
2. Basic Electrical and Electronics Engineering

Course Description:

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

Course Objectives:

1. To understand operation and characteristics of semiconductor devices.
2. To analyze diode, BJT, and FET-based circuits.
3. To apply small signal analysis for amplifiers.
4. To design analog circuits like amplifiers, oscillators, and regulators.
5. To study power amplifiers and regulated power supplies.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Explain operation of semiconductor devices and diode circuits
CO2	Analyze BJT and FET circuits using biasing and small signal models
CO3	Design amplifier circuits for given specifications
CO4	Evaluate performance of oscillators and power amplifiers
CO5	Design regulated power supply circuits

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Bipolar Junction Transistor:** Need for biasing BJT, Transistor biasing methods, Transistor as amplifier , Analysis of Single Stage Amplifier, RC coupled Amplifiers, Effects of bypass and coupling capacitors, Frequency response of CE amplifier, Emitter follower, Cascaded Amplifier, Need for multistage amplifiers and suitability of CE, CC and CB configurations in multistage amplifiers.	7
2.	**Junction Field Effect Transistor and MOSFET:** JFET: JFET and its characteristics, Pinch off voltage, Drain saturation current, JFET amplifiers, CS, CD, CG amplifiers. MOSFET: Overview of DMOSFET, EMOSFET,MOSFET as an Amplifier and Switch, Biasing in MOSFET, Small signal operation and models, Single stage MOS amplifier, MOSFET capacitances, Comparison of FET with MOSFET and BJT w.r.t. to device and Circuit parameter.	7
3.	**Power Amplifiers :** Introduction, classification of power amplifiers -A, B, AB, C and D, transformer coupled class A amplifier, Class B push pull and complementary symmetry amplifier, efficiency, calculation of power output, power dissipation, cross over distortion and its elimination methods, need of heat sink and its design.	7
4.	**Feedback amplifiers:** Principle of Negative feedback in electronic circuits, Voltage series, Voltage shunt, Current series, Current shunt types of Negative feedback, Typical transistor circuits effects of Negative feedback on Input and Output impedance, Voltage and Current gains, Bandwidth, Noise and Distortion.	7
5.	**Oscillators & Voltage Regulator Circuits:** Principle of Positive feedback, Concept of Stability in electronics circuits, Barkhausen criteria for oscillation, RC, Clapp, Wien Bridge, Colpitt, Hartley, Tuned LC, UJT,	7

	Relaxation Oscillators. Transistor application: Discrete transistor voltage Regulation, series voltage regulator, shunt voltage regulator. IC Voltage Regulators: Three terminal voltage regulator, Variable voltage regulator.	

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Electronic Devices and circuits	S.Salivahanan,N Suresh Kumar, A Vallavaraj	TMH Publication
2.	Microelectronic Circuits	A.S.SedraandK.C.Smith	Saunder CollegePublishing, 1991.
3.	Electronic Devices and Circuits	David A. Bell	Oxford University Press, 2008.
4.	Electronic Devices and Circuit Theory	Boylestad	Pearson Publication.

Reference Books			
1.	Electronic Devices and Circuits	A.P. Godse and U.A. Bakshi	SciTech Publication.
2.	Electronic Devices and Circuits	Allen Mottershead	PHI 3
3.	Electronic Devices and Circuits	J.B.Gupta	Katson Publication

Title of the Course: Digital Electronics **Course Code:** 25ETC2303	**L**	**T**	**P**	**Credit**
	3	**--**	**-**	**3**

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

Course Description: Digital Circuits are part of any electronics and circuit today.This proposed course will cover all fundamental concepts in degital design .The course will start with boolean algebra followed by combinational circuits and sequential circuit,digital circuit design. It also focuses on prescribed gate syllabus of electronics and Telecommunication Engineering .

Course Objectives:

1**. To introduce** the fundamentals of Boolean algebra, logic gates, and techniques for simplification of logic expressions using K-maps.

2. **To develop** the ability to design and analyze combinational logic circuits such as adders, subtractors, comparators, and code converters.

3. **To impart** knowledge of data processing circuits including multiplexers, demultiplexers, encoders, and decoders for digital system applications.

4. **To enable** students to understand and design sequential logic circuits using flip-flops, registers, and finite state machines.

5. **To provide** understanding of counters, logic families, and semiconductor memory devices used in modern digital systems.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	To Apply Boolean algebra laws and Karnaugh map techniques to **simplify and implement logic expressions** using basic and universal gates.
CO2	To Design and analyze **combinational circuits** such as adders, sub tractors, comparators, and code converters for digital applications.
CO3	To Design and implement **multiplexers, demultiplexers, encoders, and decoders**, and use them to realize complex logic functions
CO4	To Analyze and design **sequential circuits** using flip-flops, registers, and state machines, including state reduction and assignment.
CO5	To Evaluate and design **counters and sequential systems**, and explain the characteristics of **logic families and semiconductor memory devices.**

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	**Boolean Algebra & Logic Gates** Basic logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR) Boolean algebra laws and theorems ,De Morgan's theorem ,SOP and POS forms ,Canonical forms (minterms and maxterms) ,K-map simplification (up to 4 variables) ,Implementation of Boolean expressions using gates	7
2.	**Combinational Logic Circuits:** Design and analysis procedure ,Arithmetic circuits: Half adder, Full adder ,Ripple carry and Carry look-ahead adder,Subtractor and BCD adder ,Code converters (e.g., BCD to 7-segment) ,Comparator and parity generator/checker ,ALU basics	7
3.	**Data Processing Circuits:** Multiplexers and Demultiplexers **,**Encoders and Decoders **,**Priority encoder **,**Magnitude comparator **,**Implementation of logic functions using MUX **,**Applications of MUX/DEMUX	7
4	**Sequential Logic Circuits:** Latches and Flip-flops (SR, JK, D, T) **,**Characteristic and excitation tables **,**Race around condition and clocking **,**Registers and shift registers (SISO, SIPO, PISO, PIPO) **,**State diagram and state table **,**State reduction and assignment	7
5	**Integrated circuit, Logic Families and Semiconductor Memories:** Study of Logic families:TTL, CMOS, Comparison of TTL and CMOS families.Static and dynamic Characteristic of TTL NAND gate, Voltage and current Specifications, Noise margin, fan-in, fan-out, Propagation delay, Tristate logic, interfacing of logic families (TTL, CMOS) with	7

	others. Memory Devices: ROM, PROM ,EPROM, EEPROM, RAM,SRAM,DRAM. Flash ROM.	

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Digital Circuits	Anand Kumar_	PHI
2.	Digital Design	M.Morris Mano	PHI
3.	Digital System design using Verilog cengage	Charles Roth,Lizy k, John, kil lee,	PHI

Reference Books			
1.	Modern digital electronics	R.P. Jain	3rd edition, 12threprint Tata McGraw Hill Publication,2007
2.	An Engineering Approach to Digital Design	WilliamI .Fletcher	PHI/Pearson
3.	Digital Circuit Design with VHDL	Pedroni V.A	Prentice Hall India, 2nd 2001 Edition

Title of the Course: Analog Communication **Course Code:** 25ETC2304	**L**	**T**	**P**	**Credit**
	3	**--**	**-**	**3**

Course Pre-Requisite: Basic knowledge of signals and systems, electronic devices and circuits, and fundamental mathematics (trigonometry and calculus).

Course Description: This course introduces the principles of analog communication systems, including modulation techniques (AM, FM, PM), signal transmission, receiver design, demodulation methods, multiplexing, and the impact of noise on system performance**.**

Course Objectives:

To introduce the concepts of analog communication systems.

2. To equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.

3. To understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Understand and identify the fundamental concepts and various components of analog communication systems.
CO2	Understand the concepts of modulation and demodulation techniques
CO3	Design circuits to generate modulated and demodulated wave
CO4	Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance.
CO5	Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase)

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents

Unit No.	Unit Title and Contents	Hours
1	**Introduction to Communication System:** Block schematic of communication system, Simplex and duplex systems, Modes of communication: Broadcast and point to point communication, Necessity of modulation, Classification of modulation, Sampling theorem and pulse analog modulation, Multiplexing: TDM, FDM.	07
2	**Amplitude Modulation:** Introduction, Mathematical analysis and expression for AM, Modulation index, Frequency spectrum and bandwidth of AM, Power calculations, Generation of AM using nonlinear property, Low- and high-level modulation, Balanced modulator. Types of AM: DSB-FC, DSB-SC, SSB-SC, ISB, VSB, their generation methods and comparison.	07
3	**Frequency and phase Modulation:** Introduction, Mathematical analysis of FM and PM, Modulation index for FM and PM, Frequency spectrum and bandwidth of FM, Narrowband and wideband FM, Direct and indirect methods of FM generation, pre-emphasis and de-emphasis, Comparison of AM, FM and PM.	07
4	**Radio Receivers and Demodulators:** Introduction, Performance characteristics of receivers: Sensitivity, Selectivity, Fidelity, Image frequency and IFRR, Tracking and double spotting, TRF and super heterodyne receivers, RF amplifier, Local oscillator and mixer, IF amplifier, AGC.	07
5	**AM and FM Detectors and Noise:** AM detectors: Envelope detector and practical diode detector, FM detectors: Slope detector, Phase discriminator and ratio detector. Noise: Introduction, Sources and classification of noise, Noise calculations (thermal noise), SNR, Noise figure, Noise factor, Noise temperature.	07

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1	Electronic Communication Systems	Kennedy	McGraw-Hill, New Delhi
2	Principles of Communication Engineering	Anokh Singh	S. Chand
3	Electronic Communication	Roddy & Coolen	PHI
4	Principles of Communication Systems	Taub & Schilling	Tata McGraw-Hill

Reference Books			
1.	Modern Electronic Communication	Beasley & Miller	Prentice-Hall India
2.	Electronic Communication Systems	Wayne Tomasi	Pearson Education
3.	Audio & Video Systems	R. G. Gupta	Tata McGraw-Hill, New Delhi
4	Modern Electronic Communication	Beasley & Miller	Prentice-Hall India

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https://onlinecourses.nptel.ac.in/noc21_ee74/preview

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

Course Pre-Requisite:

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

Course Description:

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

Course Objectives:

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

Course Outcomes:

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

CO-PO Mapping:

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

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

Course Contents

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

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

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

Title of the Course: Ethics in Engineering Practices **Course Code:** 25OE2302	**L**	**T**	**P**	**Credit**
	2	**-**	**-**	**2**

Course Pre-Requisite:

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

Course Description:

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

Course Objectives:

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

Course Outcomes:

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

CO-PO Mapping:

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

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

CA1 and CA**2** are based on the Assignment/ Surprise test/ Quiz/Seminar/Group discussions / presentation, etc.

MSE is based on 50% of course content.

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

Course Contents

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

4	**Ethical Decision Making and Leadership -** Ethical Decision Models, Value-Based Leadership, Organizational Ethics, Governance and Compliance, Stakeholder Management, Ethical Risk Assessment	**07**

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

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

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

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

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

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

Course Outcomes:

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

CO-PO Mapping:

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

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

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents:

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

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

Reference Books:			
1.	Project Management: A Systems Approach to Planning, Scheduling, and Controlling	Harold Kerzner	John Wiley & Sons
2.	Information Technology Project Management	Kathy Schwalbe	Cengage Learning
3.	A Guide to the Project Management Body of Knowledge (PMBOK® Guide)	Project Management Institute (PMI)	Project Management Institute (PMI)

Certification Course NPTEL Link:

Sr. No.	Course	Provider /Platform	Level	Mode	Certification Authority
1.	Project Management	nptel.ac.in/courses/110104073?utm_source=chatgpt.com	UG	Online	NPTEL
2.	Project Management For Managers	Project management for managers - Course	UG	Online	NPTEL

Title of the Course: Digital Electronics and Microprocessor	**L**	**T**	**P**	**Credit**
Course Code: 25MMETC2301	**3**	**--**	**-**	**3**

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

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

Course Objectives:

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

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

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

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

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

Course Outcomes:

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

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	15
MSE	20
CA2	15
ESE	50

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

MSE is based on 50% of course content.

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

Course Contents

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

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Digital Circuits	Anand Kumar_	PHI
2.	Microprocessor-Architecture, programming and application with 8085	Gaonkar	penram international.
3.	The 8085 microcontroller & embedded system, using assembly and C	M. A. Mazidi	2nd edition, Pearson edu

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

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

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

Course Description:
The Universal Human Values course is designed to foster holistic personal development and interpersonal skills through active, experience-based learning. The curriculum guides students in mastering self-management techniques, including time management, stress reduction, and SWOT analysis, equipping them to handle real-world challenges like peer pressure and anger effectively. Furthermore, by emphasizing priority management and dedication, the course empowers students to formulate clear academic and career goals while thoughtfully balancing the expectations of their family, peers, society, and the nation.
In addition to individual growth, the course places a strong emphasis on building healthy relationships and maintaining overall well-being. Students learn to navigate competition and cooperation, express gratitude towards mentors and parents, and constructively resolve conflicts in various settings. Finally, the curriculum addresses vital life skills such as adapting to new environments by managing homesickness, sustaining a healthy lifestyle through self-evaluation and a balanced diet, and cultivating a caring, responsible attitude towards nature.

Course Objectives:

1. To introduce students to fundamental self-management skills, including SWOT analysis and time management, equipping them to effectively cope with stress, anger, and peer pressure.

2. To foster an understanding of healthy interpersonal dynamics by teaching students how to navigate competition, express gratitude, and constructively resolve conflicts in their relationships.

Course Outcomes:

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

CO-PO MAPPING:

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

Assessment Scheme:

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

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

Assessment Details:

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

Course Contents:

Unit No.	Unit Title and Contents	Hours
1.	**Self-Management:** Self-confidence, peer pressure, time management, anger, Stress, Personality Development, Self-improvement, SWOT analysis	5
2.	**Relationships:** Home sickness, gratitude towards parents, teachers and others Ragging and interaction Competition and cooperation, Types of conflicts and conflict resolution.	5
3.	**Individual academic, career:** Expectations of family, peers, society, nation, fixing the goals. Time management, priority management, Dedication, devotion.	5
4.	**Self-evaluation and Healty life:** Sharing and feedback Health issues, healthy diet, healthy lifestyle. Caring the nature, Self evaluation techniques.	5

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

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

REFERENCE BOOKS:			
1.	Fundamentals of Ethics for Scientists &Engineers,	--	Oxford University Press
2.	Human Values	A N Tripathy	New Age International Publishers.
3.	Foundations of Ethics and Management	B P Banerjee	Excel Books

Title of the Course: Electronics Devices and Circuits Laboratory **Course Code:**25ETC2302L	**L**	**T**	**P**	**Credit**
	--	**--**	**2**	**1**

Course Pre-Requisite:

1. Basic knowledge of electronic components
2. Understanding of diode, BJT, and FET fundamentals
3. Basic circuit analysis

Course Description:

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

Course Objectives:

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

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Perform experiments on diode and transistor circuits
CO2	Analyze amplifier and oscillator responses
CO3	Design and test power supply circuits
CO4	Interpret experimental results and validate theory
CO5	Develop basic PCB layouts for circuits

CO-PO Mapping:

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

Assessment Scheme:

Two components of Continuous Assessment (CA-1, CA-2), and End Semester Examination (ESE) having 60% and 40% weightage respectively.

Assessment Component	Marks
CA1	25
MSE	-
CA2	25
ESE	50

CA1 and **CA2** have 30% weightage each, and are based on practical performance and oral examination.

MSE -

ESE is based on 100% course content.

Course Contents

Sr. No.	List of Experiment	Hours
1.	Study V-I characteristics of P-N Junction Diode	2
2.	Design and test Half-wave and Full-wave Rectifier	2
3.	Analysis of Clipper and Clamper circuits	2
4.	Study input and output characteristics of BJT	2
5.	Plot frequency response of single-stage RC coupled amplifier	2
6.	Implementation of RC Phase Shift Oscillator	2
7.	Analyze Class B / Class AB Push-Pull Power Amplifier	2

8.	Design regulated power supply with filter	2
9.	Study IC voltage regulators (78XX / LM317)	2
10.	Analysis of Emitter Follower voltage Regulators.	2

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

Reference Books			
1.	Electronics Devices and Circuits	Boylestad	Prentice Hall

Title of the Course: Digital Electronics Laboratory	**L**	**T**	**P**	**Credit**
Course Code: 25ETC2303L	**--**	**--**	**2**	**1**

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

Course Description: Digital Circuits are part of any electronics and circuit today.This proposed course will cover all fundamental concepts in degital design .The course will start with boolean algebra followed by combinational circuits and sequential circuit, digital circuit design. It also focuses on prescribed gate syllabus of electronics and Telecommunication Engineering.

Course Objectives:

1**. To understand and verify** the operation of basic logic gates and their IC implementations, including the use of universal gates.

2. **To apply Boolean algebra and De Morgan's theorem** for simplification and implementation of logic expressions using minimum number of gates.

3. **To design and implement combinational circuits** such as adders, multiplexers, multipliers, and comparators using standard ICs.

4. **To design and analyze sequential circuits,** including synchronous counters using flip-flops and ICs like 7473.

5. **To develop practical skills** in using digital ICs (74xx series), breadboards, and testing equipment for real-time circuit implementation.

Course Outcomes:

CO	**After the completion of the course the student should be able to**
CO1	Understand and verify the operation of basic logic gates and implement Boolean expressions using universal gates
CO2	Apply Boolean laws and De Morgan's theorem to simplify and implement logic circuits
CO3	Design and implement combinational circuits such as adders, multiplexers, multipliers, and comparators
CO4	Design and analyze sequential circuits such as synchronous counters using flip-flops and ICs
CO5	Develop and test digital circuits using ICs like 74xx series for real-time applications

CO-PO Mapping:

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

Assessment Scheme:

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

Assessment Component	Marks
CA1	25
MSE	--
CA2	25
ESE	50

CA1 and CA2 have 30% weightage each, and are based on practical performance and oral examination. MSE - ESE is based on 100% course content.

Course Contents

Unit No.	Unit Title and Contents	Hours
1.	Design and implementation of boolean equation using basic gates	2
2.	Design and implement Half adder and Full adder.	2
3.	Design and verify the working of Multiplexer and demultiplexer	2
4.	Implementation and verification of decoder and encoder using logic gate	2
5.	Design of flip-flops using logic gates (D-Flip-flop, S-R Flip-flop)	2
6.	Design and implement synchronous & asynchronous counter	2
7.	Design and implementation of shift register	2
8.	Design and implementation of magnitude comparator	2
9.	Design and implementation of sequence detector	2
10.	Measurement of CMOS propagation delay with different supply voltages	2

Text Books			
Sr.No	**Title**	**Author**	**Publisher**
1.	Fundamentals of Digital Circuits	Anand Kumar_	PHI
2.	Digital Design	M.Morris Mano	PHI
3.	Digital System design using Verilog cengage	Charles Roth,Lizy k, John, kil lee,	PHI

Reference Books			
1.	Modern digital electronics‖	R.P. Jain	3rd edition, 12threprint Tata McGraw Hill Publication,2007
2.	An Engineering Approach to Digital Design	WilliamI .Fletcher	PHI/Pearson
3.	Digital Circuit Design with VHDL	Pedroni V.A	Prentice Hall India, 2nd 2001 Edition

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