

Puducherry

B.TECH. - MECHANICAL ENGINEERING

ACADEMIC REGULATIONS 2023 (R-2023)

CURRICULUM AND SYLLABI Volume – I



COLLEGE VISION AND MISSION

VISION

To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

Mission

M1: Quality Education:

To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.

M2: Research and Innovation:

To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.

M3: Employability and Entrepreneurship:

To inculcate the employability and entrepreneurial skills through value and skill based training.

M4: Ethical Values:

To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

DEPARTMENT VISION AND MISSION

VISION

The Mechanical Engineering department strives to be recognized as an excellent academic and research center for creating outstanding Engineers, Entrepreneurs and Leaders

Mission

M1: Professional Skills:

To provide quality education to enhance students inter-personal and intra-personal skills

M2: State-of-art facilities:

To render excellent infrastructure facilities and laboratories to excel as skilled professionals

M3: Research Exposure:

To Strengthen Research and Development within the department through industrial associations

M4: Employability:

To put enthusiastic exertions to enhance employability and entrepreneurship skills of students

M5: Human Values:

To empower students with professional ethics and human values to serve the society

PROGRAMME OUTCOMES (POs)

PO1: Engineering knowledge:

Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis:

Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design/development of solutions:

Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems:

Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.

PO5: Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.

PO8: Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work:

Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: Technical knowledge

To foster our young graduates with cogent technical knowledge so as to make them employable

PEO2: Real-Time Applications

To apply the acquired knowledge in the field of Mathematics, Science and Engineering in developing real-time projects

PEO 3: Design Ability

To design a system, component or process to meet the desired needs within realistic constraints such as manufacturing, economy, environmental sustainability, social, health and safety

PEO 4: Ethics

To prepare the students to become entrepreneurs with professional attitude in the broader ethical perspective

PEO 5: Life - Long Learning

To craft curiosity among students for life-long learning through self-study

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Solving real time problems

To develop capability to identify, analyze and solve engineering problems in concern to mechanical engineering along with associated engineering streams.

PSO 2: Pursue Professional career

To bestow quality learning environment to pursue professional career in mechanical engineering with integrated knowledge

PSO 3: Concentrating on skill development

To enflame the student's technical capabilities in engineering design process, intra and inter personnel, linguistic and higher level professional skills required in engineering.

S.No	Course Category	Breakdown of Credits
1	Humanities and Social Science and Management courses (HS)	15
2	Basic Sciences (BS)	20
3	Engineering Sciences (ES)	29
4	Professional Core (PC)	66
5	Professional Electives (PE)	18
6	Open Electives (OE)	09
7	Professional Activities (PA)	13
8	Ability Enhancement Courses (AEC*)	-
9	Mandatory courses (MC*)	-
	Total	170

STRUCTURE FOR UNDERGRADUATE ENGINEERING PROGRAM

SCHEME OF CREDIT DISTRIBUTION – SUMMARY

SI. Course Category		Credits per Semester								Total
No	oourse oalegory		II	III	IV	v	VI	VII	VIII	Credits
1	Humanities and Social Sciences and Management courses (HS)	3	5	1	1	2	-	-	3	15
2	Basic Sciences(BS)		4	5	4	-	-	-	-	20
3	Engineering Sciences (ES)	9	8	4	4	4	-	-	-	29
4	Professional Core (PC)	3	4	14	11	8	15	11	-	66
5	Professional Electives (PE)	-	-	-	3	3	3	3	6	18
6	Open Electives (OE)	-	-	-	-	3	3	3	-	09
7	Professional Activities (PA)	-	-	-	-	1	1	3	8	13
8	Ability Enhancement Courses (AEC*)	-	-	-	-	-	-	-	-	-
9 Mandatory courses (MC*)		-	-	-	-	-	-	-	-	-
	Total			24	23	21	22	20	17	170

* AEC and MC are not included for CGPA calculation

SEMESTER – I										
SI.	Course	Course Title	Category	Pe	erio	ds	Credits	М	ax. Mar	'ks
No.	Code		Oalcyory	L	Т	Ρ	orcuits	CAM	ESM	Total
Theo	ory									
1	U23MATC01	Engineering Mathematics - I	BS	3	1	0	4	25	75	100
2	U23BSTC01	23BSTC01 Physical Science for BS Engineers BS		3	0	0	3	25	75	100
3	U23ESTC02	Engineering Mechanics	ES	2	1	0	3	25	75	100
4	U23ESTC03	Basics of Electrical and Electronics Engineering	ES	3	0	0	3	25	75	100
5	U23MET101	Concept of Engineering Design	PC	3 0 0		3	25	75	100	
Theo	Theory cum Practical									
6	U23ENBC01	Communicative English - I	HS	2	0	2	3	50	50	100
Prac	tical		•	•	•					
7	U23ESPC01	Basics of Electrical and Electronics Engineering Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC02	Design Thinking and IDEA Lab	ES	0	0	2	1	50	50	100
9	U23ESP101	Engineering Mechanics Laboratory	ES	0	0	2	1	50	50	100
Abili	ty Enhanceme	nt Course	•	•	•					
10	10 U23MEC1XX Certification Course - I ** AEC 0 0 4 - 100 - 100							100		
Mandatory Course										
11	U23MEM101	Induction Programme	MC	2\	Nee	eks	-	-	-	-
	TOTAL 22 395 605 1000									

	SEMESTER – II									
SI.	Course	Course Title	Category	Pe	erio	ds	Cradite	M	ax. Mar	'ks
No.	Code		category	L	Τ	Ρ	oreans	CAM	ESM	Total
Theo	ory		•							
1	U23MATC02	Engineering Mathematics – II	BS	3	1	0	4	25	75	100
2	U23CSTC01	Programming in C	ES	3	0	0	3	25	75	100
3	U23ESTC01	Basics of Civil and Mechanical Engineering	ES	3	0	0	3	25	75	100
4	U23MET202	Engineering Metallurgy	PC	3	0	0	3	25	75	100
5	U23HSTC01	Universal Human Values-II	HS	2	0	0	2	25	75	100
Theo	Theory cum Practical									
6	U23ENBC02	Communicative English - II	HS	2	0	2	3	50	50	100
Prac	tical									
7	U23CSPC01	Programming in C Laboratory	ES	0	0	2	1	50	50	100
8	U23ESPC03	Engineering Graphics using AutoCAD	ES	0	0	2	1	50	50	100
9	U23MEP201	Manufacturing and Metallurgy Laboratory	PC	0	0	2	1	50	50	100
Abili	Ability Enhancement Course									
10	U23MEC2XX	Certification Course – II **	AEC	0	0	4	-	100	-	100
Mandatory Course										
11	U23MEM202	Sports, Yoga and NSS	MC	0	0	2	-	100	-	100
	TOTAL 21 495 605 1100									

Professional Electives are to be selected from the list given in Annexure I
 Open electives are to be selected from the list Annexure II

** Certification courses are to be selected from the list given in Annexure III

SEMESTER – III										
SI.	Course	Course Title	Category	Pe	erio	ds	Crodite	М	ax. Mai	'ks
No.	Code	Course Title	Category	L	Τ	Ρ	Credits	CAM	ESM	Total
Theo	ory		r	r	1			1		
1	U23MATC03	Probability and Statistics	BS	3	1	0	4	25	75	100
2	U23ADTC01	Programming in Python	ES	3	0	0	3	25	75	100
3	U23MET303	Applied Thermodynamics	PC	2	1	0	3	25	75	100
4	U23MET304	Fluid Mechanics and Hydraulic Machines	PC	2	1	0	3	25	75	100
5	U23MET305	Manufacturing Processes	PC	3	0	0	3	25	75	100
Theo	Theory cum Practical									
6	U23MEB301	Strength of Materials	PC	2	0	2	3	50	50	100
Prac	Practical									
7	U23ENPC01	General Proficiency - I	HS	0	0	2	1	50	50	100
8	U23MAPC01	Engineering Mathematics Laboratory	BS	0	0	2	1	50	50	100
9	U23ADTP01	Programming in Python Laboratory	ES	0	0	2	1	50	50	100
10	U23MEP302	Manufacturing Processes Laboratory	PC	0	0	2	1	50	50	100
11	U23MEP303	Fluid Mechanics and Hydraulic Machines	PC	0	0	2	1	50	50	100
		Laboratory								
Ability Enhancement Course										
12	U23MEC3XX	Certification Course – III	AEC	0	0	4	-	100	-	100
13	U23MES301	Skill Development Course - I*	SEC	0	0	2	-	100	-	100
Man	datory Course				1	1				
14	U23MEM303	Climate Change	MC	2	0	0	-	100	-	100
	TOTAL 24 695 705 1400									

SEMESTER – IV											
SI.	Course	Course Title	Category	Pe	erio	ds	Crodite	Μ	ax. Mai	rks	
No.	Code	Course Title	Calegoly	L	Т	Ρ	Cieuns	CAM	ESM	Total	
Theo	Theory										
1	U23MATC04	Numerical Methods and Optimization	BS	3	1	0	4	25	75	100	
2	U23ITTC03	Programming in Java	ES	3	0	0	3	25	75	100	
3	U23MET407	Heat and Mass Transfer	PC	2	1	0	3	25	75	100	
4	U23MET408	Computer Aided Design	PC	3	0	0	3	25	75	100	
5	U23MEE4XX	Professional Elective – I #	PE	3	0	0	3	25	75	100	
Theo	Theory cum Practical										
6	U23MEB402	Kinematics of Machinery	PC	2	0	2	3	50	50	100	
Prac	tical										
7	U23ENPCO2	General Proficiency - II	HS	0	0	2	1	50	50	100	
8	U23ITPC03	Programming in Java Laboratory	ES	0	0	2	1	50	50	100	
9	U23MEP404	CAD/CAM Laboratory	PC	0	0	2	1	50	50	100	
10	U23MEP405	Heat Transfer Laboratory	PC	0	0	2	1	50	50	100	
Abili	ity Enhanceme	nt Course									
11	U23MEC4XX	Certification Course – IV	AEC	0	0	4	-	100	-	100	
12	U23MES402	Skill Development Course - II*	SEC	0	0	2	-	100	-	100	
Mandatory Course											
13	U23MEM404	Right to Information and Good Governance	MC	2	0	0	-	100	-	100	
	TOTAL 23 645 655 1300										

B.Tech. Mechanical Engineering

* Skill Enhancement Courses (I and II) are to be selected from the list given in Annexure III

	SEMESTER – V										
SI.	Course	Course Title	Category	Pe	erio	ds	Credits	М	ax. Mai	rks	
No.	Code		e alle gel y	L	Τ	Ρ	0.000	CAM	ESM	Total	
Theo	Theory										
1	U23HSTC02	Research Methodology	HS	2	0	0	2	25	75	100	
2	U23CSTC03 Data Structures ES 3 0 0		3	25	75	100					
3	U23MET510	Dynamics of Machinery	PC	2	1	0	3	25	75	100	
4	U23MET511	Design of Machine Elements	PC	2	1	0	3	25	75	100	
5	U23MEE5XX	Professional Elective – II #	PE	3	0	0	3	25	75	100	
6	U23MEO5XX	Open Elective - I	OE	3	0	0	3	25	75	100	
Prac	tical										
7	U23CSPC02	Data Structures Laboratory	ES	0	0	2	1	50	50	100	
8	U23MEP506	Analysis and Simulation Laboratory	PC	0	0	2	1	50	50	100	
9	U23MEP507	Dynamics of Machinery Laboratory	PC	0	0	2	1	50	50	100	
Proj	ect Work										
10	U23MEW501	Micro Project	PA	0	0	2	1	100	-	100	
Abili	ity Enhanceme	nt Course									
11	U23MEC5XX	Certification Course – V	AEC	0	0	4	-	100	-	100	
12	U23MES503	Skill Development Course - III	SEC	0	0	2	-	100	-	100	
Man	Mandatory Course										
13	U23MEM505	Essence of Indian Traditional Knowledge	MC	2	0	0	-	100	-	100	
	TOTAL 21 700 600 1300										

	SEMESTER – VI									
SI.	Course	Course Title	Category	Pe	erio	riods Credits		м	ax. Ma	rks
No.	Code		Calogory			e. euro	CAM	ESM	Total	
The	ory									
1	U23MET612	Metrology and Measurement	PC	3	0	0	3	25	75	100
2	U23MET613	T613 Thermal Engineering PC		2	1	0	3	25	75	100
3	U23MET614 Manufacturing Technology and Automation PC 3 0 0 3		3	25	75	100				
4	U23MEE6XX	Professional Elective – III #	PE	3	0	0	3	25	75	100
5	U23MEO6XX	Open Elective - II	OE	3	0	0	3	25	75	100
The	Theory cum Practical									
6	U23MEB603	Automobile Engineering	PC	2	0	2	3	50	50	100
Prac	ctical									
7	U23MEP608	Thermal Engineering Laboratory	PC	0	0	2	1	50	50	100
8	U23MEP609	Metrology and Measurements Laboratory	PC	0	0	2	1	50	50	100
9	U23MEP610	Advanced Manufacturing Laboratory	PC	0	0	2	1	50	50	100
Proj	ect Work									
10	U23MEW602	Mini Project	PA	0	0	2	1	100	-	100
Ability Enhancement Course										
11	U23MEC6XX	Certification Course – VI	AEC	0	0	4	-	100	-	100
Man	datory Course									
12	U23MEM606	Gender Equality	MC	2	0	0	-	100	-	100

τοται	22	505	605	1200
IUIAL	22	292	605	1200

	SEMESTER – VII									
SI.	Course	Course Title	Category	P	Periods		Credits	Max. Marks		ks
No.	Code			LTP			CAM	ESM	Total	
Theo	Theory									
1	U23MET715	Production Planning and Cost Estimation	PC	3	0	0	3	25	75	100
2	U23MET716	Industrial Automation and Robotics	PC	3	0	0	3	25	75	100
3	U23MET717	Design of Transmission System	PC	2	1	0	3	25	75	100
4	U23MEE7XX	Professional Elective - IV #	PE	3	0	0	3	25	75	100
5	U23MEO7XX	Open Elective - III	OE	3	0	0	3	25	75	100
Prac	tical									
6	U23MEP711	Industrial Automation and Robotics Laboratory	PC	0	0	2	1	50	50	100
7	U23MEP712	Seminar	PC	0	0	2	1	100	-	100
Proj	Project Work									
8	U23MEW703	Project Phase – I	PA	0	0	4	2	50	50	100
9	U23MEW704	Internship / Inplant Training	PA	-	-	2	1	100	-	100
	TOTAL 20 425 475 900									

	SEMESTER – VIII															
SI.	Course	Course Title	Category	Periods		Periods		Periods		Periods		Periods		Μ	ax. Mar	ks
No.	Code			L	Τ	Ρ		CAM	ESM	Total						
Theo	Theory															
1	U23HSTC03	Entrepreneurship and Business Management	HS	3	0	0	3	25	75	100						
2	U23MEE8XX	Professional Elective – V#	PE	3	0	0	3	25	75	100						
3	U23MEE8XX	Professional Elective – V I #	PE	3	0	0	3	25	75	100						
Proje	Project Work															
4	U23MEW805	Project Phase – II	PA	0	0	16	8	50	100	150						
	Total 17 125 325 450															

ANNEXURE - I PROFESSIONAL ELECTIVE COURSES

Professional Elective – I (Offered in Semester IV)							
SI. No.	Course Code	Course Title					
1	U23MEE401	Gas Dynamics and Jet propulsion					
2	U23MEE402	Geometric Tolerance and Dimensioning					
3	U23MEE403	Product design and Development					
4	U23MEE404	Industrial Casting Technology					
5	U23MEE405	Non-Conventional Energy Sources					
Professio	onal Elective – II (Offe	red in Semester V)					
SI. No.	Course Code	Course Title					
1	U23MEE506	Turbo Machinery					
2	U23MEE507	Powder Metallurgy and Surface Coating					
3	U23MEE508	Green Manufacturing					
4	U23MEE509	Fluid Power Automation					
5	U23MEE510	IoT and Smart Manufacturing					
Professio	onal Elective - III (Offe	ered in Semester VI)					
SI. No.	Course Code	Course Title					
1	U23MEE611	Finite Element Analysis					
2	U23MEE612	Computational Fluid Dynamics					
3	U23MEE613	Fuzzy Logic and Neural Networks					
4	U23MEE614	Additive Manufacturing					
5	U23MEE615	Energy and Climate Change					
Professio	onal Elective – IV (Off	ered in Semester VII)					
SI. No.	Course Code	Course Title					
1	U23MEE716	Industrial Tribology					
2	U23MEE717	Advanced Welding Technology					
3	U23MEE718	Artificial Intelligence and Machine Learning					
4	U23MEE719	Nano Technology					
5	U23MEE720	Modelling and Simulation of Manufacturing Systems					
Professio	onal Elective – V (Offe	red in Semester VIII)					
SI. No.	Course Code	Course Title					
1	U23MEE821	Lean Manufacturing					
2	U23MEE822	Cryogenic Engineering					
3	U23MEE823	Autotronics					
4	U23MEE824	Optimization Techniques in Engineering Design					
5	U23MEE825	Total Quality Management					
Professio	onal Elective – VI (Off	ered in Semester VIII)					
SI. No.	Course Code	Course Title					
1	U23MEE826	Composites Material					
2	U23MEE827	Alternative Fuels					
3	U23MEE828	Electric and Hybrid Vehicles					
4	U23MEE829	Maintenance and Safety Engineering					
5	U23MEE830	Non-Destructive Evaluation and Testing					

ANNEXURE - II OPEN ELECTIVE COURSES

		Open Elective – I / Ope	n Elective – I	
S. No	Course Code	Course Title	Offering Department	Eligible Department to opt OE course
1	U23HSOC01	Intellectual Property Rights		Common to B. Tech
2	U23HSOC02	New Product Development		(Offered in Semester V for EEE_ECE
3	U23HSOC03	Finance for Engineers	MBA	ICE, CIVIL, BME, CCE, FT)
4	U23HSOC04	Economics for Engineers		(Offered in Semester VI for CSE, IT,
5	U23HSOC05	Marketing Management		MECH, Mechatronics, AI&DS)
		Open Elective – I / Open (Offered in Semester V for CSE, IT, M (Offered in Semester VI for EEE, ECE,	ECH, Mechatro ICE, CIVIL, B	nics, AI&DS) ME, CCE, FT)
1	U23EEDC01	Electrical Safety Engineering	EEE	ECE, ICE, MECH, CIVIL, MCTR, CCE, BME, IT, CSE, FT, AI&DS
2	U23EEOC02	Solar Photovoltaic Fundamental and Applications	EEE	ECE, ICE, MECH, CIVIL, MCTR, CCE, BME, IT, CSE, FT, AI&DS
3	U23ECOC01	Engineering Computation with MATLAB	ECE	EEE, ICE, MECH, CIVIL, CCE, BME, AI&DS, Mechatronics
4	U23ECOC02	Consumer Electronics	ECE	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, BME, Mechatronics, FT
5	U23CSOC01	Structured Query Language	CSE	EEE, ECE, ICE, MECH, CIVIL, BME, Mechatronics
6	U23CSOC02	Computer Peripherals and Networking	CSE	EEE, ECE, ICE, MECH, CIVIL, BME, Mechatronics
7	U23ITOC01	Database System: Design & Development	IT	EEE, ECE, ICE, BME,MECH,CIVIL, MECHATRONICS
8	U23ITOC02	Computer Hardware and Troubleshooting	IT	EEE, ECE, ICE, CCE, BME, MECH, MECHATRONICS
9	U23ICOC01	Sensors and Transducers	ICE	EEE, ECE, CSE, IT, MECH, CIVIL, CCE, CSBS, AI&DS
10	U23ICOC02	Instrumentation for Industry 4.0	ICE	EEE, ECE, CSE, IT, MECH, CIVIL, CCE, CSBS, AI&DS, Mechatronics
11	U23MEOC01	Rapid Prototyping	MECH	EEE, ECE, ICE, CIVIL, BME, FT
12	U23MEOC02	Material Handling System	MECH	EEE, ICE, CIVIL, Mechatronics
13	U23MEOC03	Industrial Engineering for Textile	MECH	FT
14	U23MEOC04	Heating, ventilation and air conditioning system (HVAC)	MECH	EEE, ECE, ICE, CIVIL
15	U23CEOC01	Energy and Environment	CIVIL	EEE, ECE, MECH, BME, IT, Mechatronics, FT, CSBS
16	U23CEOC02	Building Science and Engineering	CIVIL	EEE, MECH, BME
17	U23CEOC03	Disaster Management	CIVIL	EEE, ECE, CSE, IT, ICE, MECH, BME, CCE, AI&DS, FT
18	U23BMOC01	Medical Electronics	BME	EEE, ECE, CSE, IT, ICE, CCE, MECH, Mechatronics, AI&DS
19	U23BMOC02	Telemedicine	BME	EEE, ECE, CSE, IT, ICE, CCE, AI&DS
20	U23MCOC01	Building Automation	MCTR	EEE,MECH, CIVIL
21	U23MCOC02	Automation in Manufacturing	MCTR	EEE,MECH, CIVIL

22	U23CCOC01	Introduction to Communication Technologies	CCE	EEE, MECH, CSE,IT, CIVIL, ICE, Mechatronics, BME, AIDS
23	U23CCOC02	Introduction to Computer Networks	CCE	EEE, MECH, CIVIL, ICE, Mechatronics, BME, AIDS
24	U23ADOC01	Knowledge Representation and Reasoning	AI&DS	EEE, ECE, CSE, IT, ICE, MECH, CIVIL, CCE
25	U23ADOC02	Introduction to Data Science	AI&DS	EEE, ECE, CSE, IT, ICE, MECH, CIVIL, CCE, BME, Mechatronics
26	U23ADOC03	Principles of Artificial Intelligence and Machine Learning	AI&DS	EEE, ECE, CSE, IT, ICE, MECH, CIVIL, CCE, BME, Mechatronics.
27	U23CBOC01	Business Applications of Game Theory	CSBS	EEE,ECE,ICE,CIVIL,MECH,Mechatroni cs,BME
29	U23CBOC02	Cryptology and Analysis	CSBS	EEE,ECE,ICE,CIVIL,MECH,Mechatroni cs,BME
31	U23FTOC01	Textile Arts and Crafts	FT	
32	U23FTOC02	Garment Manufacturing Technology	FT	
		Open Elective – III (Offered	d in Semester	· VII)
1	U23EEOC03	Electric and Hybrid Vehicles	EEE	ECE, ICE, MECH, CIVIL, MCTR, CCE, BME, IT, CSE, AI&DS,CSBS
2	U23EEOC04	Energy Conservation and Management	EEE	ECE, ICE, MECH, CIVIL, MCTR, CCE, BME, IT, CSE, AI&DS,CSBS
3	U23ECOC03	IoT and its Applications	ECE	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, FT
4	U23ECOC04	Selected Topics in Communications	ECE	EEE, ICE, CSE, MECH, IT, CIVIL, CCE, BME, Mechatronics, FT
5	U23CSOC03	Web Programming	CSE	EEE, ECE, ICE, MECH, CIVIL, BME, Mechatronics
6	U23CSOC04	Cloud Technology	CSE	EEE, ICE, MECH, CIVIL, CCE, BME, Mechatronics
7	U23ITOC03	Essentials of Data Science	IT	EEE, ECE, ICE, CSE, MECH, CIVIL, CCE, BME, Mechatronics
8	U23ITOC04	Big Data Technologies	IT	EEE, ICE, MECH, CIVIL, CCE, BME
9	U23ICOC03	Fuzzy Logic and Neural Networks	ICE	CSE, IT, MECH, CSBS, AI&DS, Mechatronics
10	U23ICOC04	Industrial Automation	ICE	ECE, CSE, IT, MECH, CCE, CSBS, AI&DS
11	U23MEOC05	Creativity Innovation and New Product Development	MECH	EEE, ECE, ICE, CIVIL, BME, Mechatronics
12	U23MEOC06	Principles of Hydraulic and Pneumatic System	MECH	EEE, ECE, ICE, CIVIL
13	U23MEOC07	Supply Chain Management	MECH	EEE, ECE, CIVIL, Mechatronics
14	U23CEOC04	Air Pollution and Solid Waste Management	CIVIL	EEE, ECE, CSE, IT, ICE, MECH, BME, CCE, AI&DS, FT, CSBS
15	U23CEOC05	Energy Efficient Buildings	CIVIL	EEE, ECE, MECH
16	U23CEOC06	Global Warming and Climate Change	CIVIL	EEE,ECE, CSE, IT, ICE, MECH, BME, CCE, AI&DS, FT, CSBS
17	U23BMOC03	Medical Robotics	BME	EEE, ECE, CSE, IT, ICE, CCE, MECH, Mechatronics, AI&DS,CSBS
18	U23BMOC04	Telehealth Technology	BME	EEE,ECE, ICE, CCE
19	U23MCOC03	Non-Destructive Testing	MCTR	
20	U23MCOC04	Computer Integrated Manufacturing	MCTR	EEE
21	U23MCOC05	Robots and Systems in Smart Manufacturing	MCTR	EEE

22	U23CCOC03	Web App Development	CCE	EEE, ECE, MECH, CSE,IT, CIVIL, ICE, Mechatronics, BME, AIDS
23	U23CCOC04	Network Essentials and Security	CCE	EEE, MECH, CSE,IT, CIVIL, ICE, Mechatronics, BME, AIDS
24	U23ADOC03	Data science Application of Vision	AI&DS	EEE, ECE, CSE, IT, ICE, MECH, CIVIL, CCE, BME, Mechatronics
25	U23ADOC04	Artificial Intelligence Applications	AI&DS	EEE, ECE, CSE, IT, ICE, MECH, CIVIL, CCE, BME
26	U23CBOC03	Engineering Economics	CSBS	EEE,ECE,CSE,IT,ICE,CIVIL,MECH,Mec hatronics,CCE,BME,AIDS,FT
27	U23CBOC04	Conversational AI	CSBS	EEE,ECE,ICE,CIVIL,MECH,Mechatroni cs,BME
28	U23FTOC03	Fundamentals of Fashion Design	FT	
29	U23FTOC04	Pattern Making	FT	
		Open Elective – I / Open Elective Open Elective Courses offered to	– II / Open Ele all brach of En	ctive – III gineering
1	U23ESOC01	Sustainable Engineering		
2	U23ESOC02	Water and Waste Water Treatment		
3	U23ESOC03	Technologies for Clean and Renewable Energy		
4	U23ESOC04	Economic Growth and Development		All brach of Engineering
5	U23ESOC05	Social Innovation in Industry 4.0		
6	U23ESOC06	Urbanization and Environment		
7	U23ESOC07	Sustainable River Basin Management		
8	U23ESOC08	Environment and Development		

<u>ANNEXURE – III</u>

ABILITY ENHANCEMENT COURSES - (A) CERTIFICATION COURSES

S. No	Course Code	Course Title	Certified By
1	U23MECX01	Adobe Photoshop	Adobe
2	U23MECX02	Adobe Animate	Adobe
3	U23MECX03	Adobe Dreamweaver	Adobe
4	U23MECX04	Adobe After Effects	Adobe
5	U23MECX05	Adobe Illustrator	Adobe
6	U23MECX06	Adobe InDesign	Adobe
7	U23MECX07	Autodesk AutoCAD -ACU	Autodesk
8	U23MECX08	Autodesk Inventor - ACU	Autodesk
9	U23MECX09	Autodesk Revit - ACU	Autodesk
10	U23MECX10	Autodesk Fusion 360 - ACU	Autodesk
11	U23MECX11	Autodesk 3ds Max - ACU	Autodesk
12	U23MECX12	Autodesk Maya - ACU	Autodesk
13	U23MECX13	Cloud Security Foundations	AWS
14	U23MECX14	Cloud Computing Architecture	AWS
15	U23MECX15	Cloud Foundation	AWS
16	U23MECX16	Cloud Practitioner	AWS
17	U23MECX17	Cloud Solution Architect	AWS
18	U23MECX18	Data Engineering	AWS
19	U23MECX19	Machine Learning Foundation	AWS
20	U23MECX20	Robotic Process Automation / Medical Robotics	Blue Prism
21	U23MECX21	Advance Programming Using C	CISCO
22	U23MECX22	Advance Programming Using C ++	CISCO
23	U23MECX23	C Programming	CISCO
24	U23MECX24	C++ Programming	CISCO
25	U23MECX25	CCNP Enterprise: Advanced Routing	CISCO
26	U23MECX26	CCNP Enterprise: Core Networking	CISCO
27	U23MECX27	Cisco Certified Network Associate - Level 2	CISCO
28	U23MECX28	Cisco Certified Network Associate- Level 1	CISCO
29	U23MECX29	Cisco Certified Network Associate- Level 3	CISCO
30	U23MECX30	Fundamentals Of Internet of Things	CISCO
31	U23MECX31	Internet Of Things / Solar and Smart Energy System with IoT	CISCO
32	U23MECX32	Java Script Programming	CISCO
33	U23MECX33	NGD Linux Essentials	CISCO
34	U23MECX34	NGD Linux I	CISCO
35	U23MECX35	NGD Linux II	CISCO
36	U23MECX36	Advance Java Programming	Ethnotech

37	U23MECX37	Android Programming / Android Medical App Development	Ethnotech
38	U23MECX38	Angular JS	Ethnotech
39	U23MECX39	Catia	Ethnotech
40	U23MECX40	Communication Skills for Business	Ethnotech
41	U23MECX41	Coral Draw	Ethnotech
42	U23MECX42	Data Science Using R	Ethnotech
43	U23MECX43	Digital Marketing	Ethnotech
44	U23MECX44	Embedded System Using C	Ethnotech
45	U23MECX45	Embedded System with IOT / Arduino	Ethnotech
46	U23MECX46	English For IT	Ethnotech
47	U23MECX47	Plaxis	Ethnotech
48	U23MECX48	Sketch Up	Ethnotech
49	U23MECX49	Financial Planning, Banking and Investment Management	Ethnotech
50	U23MECX50	Foundation Of Stock Market Investing	Ethnotech
51	U23MECX51	Machine Learning / Machine Learning for Medical Diagnosis	Ethnotech
52	U23MECX52	IOT Using Python	Ethnotech
53	U23MECX53	Creo (Modelling & Simulation)	Ethnotech
54	U23MECX54	Soft Skills, Verbal, Aptitude	Ethnotech
55	U23MECX55	Software Testing	Ethnotech
56	U23MECX56	MX-Road	Ethnotech
57	U23MECX57	CLO 3D	Ethnotech
58	U23MECX58	Solid works	Ethnotech
59	U23MECX59	Staad Pro	Ethnotech
60	U23MECX60	Total Station	Ethnotech
61	U23MECX61	Hydraulic Automation	Festo
62	U23MECX62	Industrial Automation	Festo
63	U23MECX63	Pneumatics Automation	Festo
64	U23MECX64	Agile Methodologies	IBM
65	U23MECX65	Block Chain	IBM
66	U23MECX66	Devops	IBM
67	U23MECX67	Artificial Intelligence	ITS
68	U23MECX68	Cloud Computing	ITS
69	U23MECX69	Computational Thinking	ITS
70	U23MECX70	Cyber Security	ITS
71	U23MECX71	Data Analytics	ITS
72	U23MECX72	Databases	ITS
73	U23MECX73	Java Programming	ITS
74	U23MECX74	Networking	ITS
75	U23MECX75	Python Programming	ITS
76	U23MECX76	Web Application Development (HTML, CSS, JS)	ITS
77	U23MECX77	Network Security	ITS & Palo alto

78	U23MECX78	MATLAB	MathWorks
79	U23MECX79	Azure Fundamentals	Microsoft
80	U23MECX80	Azure AI (AI-900)	Microsoft
81	U23MECX81	Azure Data (DP -900)	Microsoft
82	U23MECX82	Microsoft 365 Fundamentals (SS-900)	Microsoft
83	U23MECX83	Microsoft Security, Compliance and Identity (SC-900)	Microsoft
84	U23MECX84	Microsoft Power Platform (PI-900)	Microsoft
85	U23MECX85	Microsoft Dynamics Fundamentals 365 – CRM	Microsoft
86	U23MECX86	Microsoft Excel	Microsoft
87	U23MECX87	Microsoft Excel Expert	Microsoft
88	U23MECX88	Securities Market Foundation	NISM
89	U23MECX89	Derivatives Equinity	NISM
90	U23MECX90	Research Analyst	NISM
91	U23MECX91	Portfolio Management Services	NISM
92	U23MECX92	Cyber Security	Palo alto
93	U23MECX93	Cloud Security	Palo alto
94	U23MECX94	PMI – Ready	PMI
95	U23MECX95	Tally – GST & TDS	Tally
96	U23MECX96	Advance Tally	Tally
97	U23MECX97	Associate Artist	Unity
98	U23MECX98	Certified Unity Programming	Unity
99	U23MECX99	VR Development	Unity

ABILITY ENHANCEMENT COURSES – (B) SKILL DEVELOPMENT COURSES

SI. No.	Course Code	Course Title					
1	U23MES301	Skill Development Course 1: Two wheeler Troubleshooting					
	Skill Development C	ourse 2:					
2	U23MES402	1) Four wheeler Troubleshooting					
2	U23MES403	2) Demonstration Wood routing					
	U23MES404	3) Demonstration LASER cutting					
	Skill Development C	ourse 3:					
3	U23MES505	1) Demonstration Refrigeration and Air conditioning					
	U23MES506	2) Electronic Troubleshooting for Mechanical Engineers					
	U23MES507	3) Hands-on Training in 3D Printing					

SEMESTER I

Department	Mathe	ematics		Programme : B.Tech.								
Semester	I			Course	e Categ	ory: BS	End	Seme	emester Exam Type: TE			
Course	U23M			Per	iods/W	eek	Credit	M	aximum Ma	rks		
Code	0251117			L	Т	Р	С	CAM	ESE	ТМ		
Course Name	ENG	INEER	NG MATHEMATICS – I	3	1	-	4	25	75	100		
	7		(Common to All E	Branches I	Except	CSBS)						
Prerequisite	Basic I	Mathen	natics									
	On com	npletio	n of the course, the stude	nts will be	e able t	ο			BT M (Highe:	apping st Level)		
	CO1	Under	stand the concept of Eigen val	ues and Eig	jen vect	ors, Diago	nalization of	a Matri	x ł	(3		
Course	CO2	Solve	higher order differential equation	ons					ł	(3		
Outcome	CO3	Under	stand the different types of par	tial differen	tial equa	ations			ŀ	(3		
	CO4	Know	about the Applications of doub	le and triple	integra	ls			ł	(3		
	CO5	Gain t	he knowledge about Vector Ca	alculus and	its Appli	cations			ł	(3		
UNIT – I	Matric	ces						Р	eriods:12			
Rank of a Mat Eigen vectors	trix – Sys of a real	stems of Matrix -	Linear Equations – Character Diagonalization of Matrices.	istic equation	on – Ca <u>y</u>	yley Hamil	ton Theoren	n – Eige	en values and	¹ CO1		
UNIT – II	Differe	ential E	auations (Higher Order)					Р	eriods:12			
Linear Differer coefficients – I	ntial equa Method o	ations of of Variati	higher order with constant coe on of parameters.	efficients –	Euler's I	linear equa	ation of high	er ordei	r with variable	CO2		
UNIT – III	Functi	ions of	Several Variables					Р	eriods:12			
Partial derivati	ves – To	otal deriv	atives – Maxima and Minima o	f two variab	les – La	igrange's N	Method of m	ultipliers	3.	CO3		
UNIT – IV	Multip	ole Inte	grals					P	eriods:12			
Multiple Integr – Volume as a	als – Cha i triple int	ange of tegral (C	order of integration (Cartesian artesian form).	form). App	ications	: Area as a	a double inte	egral (Ca	artesian form	⁾ CO4		
UNIT – V	Vecto	r Calcu	lus					Ρ	eriods:12			
Gradient – Div only) – Gauss	/ergence Diverger	and Cunce The	rl – Directional derivatives – Ir prem and Stoke's Theorem (wit	rotational a thout proofs	nd Sole s).	noidal vec	tor fields – F	Propertie	es (Statemen	^t CO5		
Lecture Peric	ods: 45		Tutorial Periods: 15	Practica	I Perio	ds: -		Т	otal Period	s: 60		
Text Books								i				
1. M.K. Venka	ataraman	n, "Engin	eering Mathematics", The Nation	onal Publis	ning Cor	mpany, 2 nd	¹ Edition Che	ennai, 2	016.			
2. N. P Bali a	nd Manis	sh Goyal	, "A Text Book of Engineering I	Mathematic	s", Laks	hmi Public	ations, New	Delhi, 9	9 th Edition, 20	18.		
3. S.Narayana Pvt Ltd, 20	an and T. 09.	.K. Mani	ckavasagam Pillay," Differentia	I Equations	and Its /	Applicatior	ıs", Viswana	than. S,	Printers & Pu	ıblishers		
Reference Bo	oks											
1. G. Balaji, "I	Matrices	and Cal	culus (Engineering Mathematic	s – I)" Bala	ji Public	ations, 9 th	Edition June	2023				
2. A. Singara	ivelu, "En	ngineerir	ng Mathematics – I", Meenaksh	i publicatio	ns, 1998	3.						
J. EIWIN Krey	szig, "Ad" na " Hich	ivanced	Engineering watnematics", Wi	ney, 10‴ E0 Graw – ⊔ill	Now D	ny. Jelbi 6 th Ec	lition 2018					
5. CW Evan	s. "Fnain	eerina N	Athematics" A Programmed A	Approach 3	rd Edition	n. 2019						
Web Reference	ces				_ 3100	, _0.00						
4 http://www.	vorku ca	/vaoquo	/math1025/slides/chapter/kuttle	er-linearalo	ebra –sl	ides- svste	ems of equat	ion-han	dout.pdf			

2.	http://www.math.cum.edu/~wn0g/2ch6a.pdf
3.	https://nptel.ac.in/courses/122/104/122104017/
4.	https://nptel.ac.in/courses/111/106/111106051/
5.	https://nptel.ac.in/courses/111/108/111108081/

COs	Program Outcomes (POs)										Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	1	-	2	1	1	-	-	-	-	1	3	-	-
2	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
3	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
4	3	2	1	1	-	1	1	-	-	-	-	1	3	-	-
5	2	2	1	-	-	-	1	-	-	-	-	1	3	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Assessment Continuo		inuous Asse	ssment Marks (CA	End Semester	Total			
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks	
Marks	5	5	5	5	5	75	100	

Department	Physics / Chemistry Programme : B.Tech.								
Semester	I Course Category: BS End Semester Exa								
Course	U23B	STC01	Pe	riods/W	eek	Credit	Max	imum Ma	rks
Code	0208		L	Т	Р	С	CAM	ESE	ТМ
Course Name	PHYS	SICAL SCIENCE FOR ENGINEERS	3	-	-	3	25	75	100
		(Common t	to <u>All</u> Bra	anches)					
Prerequisite	Physi	cs of 12th standard or equivalent / Che	emistry o	of 12th s	tandard o	or equivaler	nt.		
	On coi	mpletion of the course, the students	s will be	able to				BT Ma (Highes	apping t Level)
	CO1	Understand the basic of properties of ma	ignetic, di	electric a	and superc	onductors.		K	2
	CO2	Identify the wave nature of the particles,	physical	significar	nce of wav	e functions		K	3
Course	CO3	Understand the basic principles of laser a	and fiber	optics co	mmunicat	on		K	2
Outcome	CO4	Understand and familiar with the water tr	eatment.					ĸ	2
	CO5	Understand the electrode potential for uses of various batteries.	its feas	ibility in	electroch	emical reac	tion and	K	2
	CO6	Understand the specific operating c suggest a method to control corrosion.	ondition	under	which co	rosion occ	urs and	K	2
		SECTION	A - PH	SICS					
UNIT- I	Magn	etic, Dielectric and Superconductin	g Mater	ials			Peri	ods: 08	
Introduction materials-fer Dielectric bre	to magr rites-Die eakdown	etic materials, Ferromagnetism- Domain lectric materials-Typesof polarization – L - Ferroelectric materials-Superconducting	theory-Ty angevin- materials	ypes of Debye e and thei	energy-Hy quation-Fr ir propertie	steresis-Har equency eff s.	d and Sof ects on p	t magnetic olarization	CO1
UNIT- II	Quan	tum Mechanics					Peri	ods: 07	k
Matter Wave	es - de B	roglie Wavelength - Uncertainty Principle	–Physica	I Signific	ance of wa	ave functions	s - Schrod	inger wave	
Equation - T	ime Dep	endent - Time Independent - Application to	Particle	in a One	Dimensio	nal Box - Tu	nnel Diode).	CO2
UNIT- III	Laser	and Fiber Optics					Peri	ods: 07	
Lasers - Prin Laser Actior Propagation index, mode	nciples c n – com of light i)	of Laser - Spontaneous and Stimulated En ponents of laser - Types of Lasers - No n optical fiber - Numerical aperture and a	missions IYAG, CC cceptance	 Einstei D₂ laser, angle - 	n's Coeffic GaAs La Types of	sients - Pop ser Fiber O optical fiber	ulation Inv ptics - Pri s (material	ersion and nciple and , refractive	CO3
		SECTION B	- CHEN	IISTRY					
UNIT- IV	Wate	r and its treatment					Peri	ods: 08	
Water: Sour alkalinity, TE - Treatment External trea	ces and i OS, COD of boiler atment–lo	impurities, Water quality parameters: Defin and BOD. Desalination of brackish water: feed water: Internal treatment (phosphat on exchange demineralization and zeolite p	nition and Reverse e, colloid process.	significa osmosis al, sodiu	nce of-cole -disadvant m alumina	or, odour, tu ages of usin ite and Calg	rbidity, pH g hard wa Jon conditi	, hardness ter in boile oning) and	CO4
UNIT- V	Elect	rochemical Cells and Storage Devic	es				Peri	ods: 08	
Galvanic ce measuremen Batteries an fuel cell-app	lls, singl nt. Nern d fuel ce lications.	e electrode potential, standard electrode st equation. Electrolyte concentration c Ils: Types of batteries - alkaline battery-le	e potenti ell. Refe ad storaç	al, electi rence e je batter	rochemica lectrodes-l y- nickel-c	series. EN nydrogen, c admium bat	/IF of a c alomel ar tery- fuel c	ell and its ndAg/AgCl cell H2 -O2	CO5
UNIT- VI	Corro	sion					Peri	ods: 07	i
Corrosion – control – ma cathodic me Copper and	Introduc terial sele thod. Us electrole	tion - factors – types – chemical, electroc ection and design aspects – electrochemica es of inhibitors, metallic coating – anodic ss plating of nickel.	chemical al protecti coating,	corrosior on – sac cathodio	n (galvanic rificial anoo c coating.	, differential de method a Metal claddi	aeration), nd impress ing, Electro	corrosion ed current oplating of	CO6
Lecture Per	riods: 4	5 Tutorial Periods: -	Practic	al Peri	ods: -		Total	Periods:	45
Text Books									
1. V Rajend	lran, "En	gineering Physics", 2nd Edition, TMH, New	v Delhi 20)11.					
2. S.S Dara	– "A tex	t book of Engineering Chemistry" - 15th Ec	dition, 202	21. S.Ch	and Public	ations.			
	Ionica Is	in "Engineering Chemistryll" 17thEd Dha	annatRai I	Pub. Co.	. NewDelh	i. (2015).			

B.Tech. Mechanical Engineering

Ref	erence Books
1.	R.Murugeshan, "Modern Physics", S. Chand &Co, New Delhi 2006.
2.	William D Callister Jr., "Material Science and Engineering", 6th Edition, John Wiley and sons, 2009.
3.	Jain & Jain "Engineering chemistry", 23rd Edition, DhanpatRai Publishing Company. 2022
4.	Mars Fontana "Corrosion Engineering", July 2017
5.	JinaRedlin, "Handbook of Electrochemistry", March 28, 2005
We	b References
1.	https://www.sciencedaily.com/terms/materials_science.htm.
2.	https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers/materials science.html.
3.	https://study.com/academy/lesson/semiconductors-superconductors-definition-properties.html
4.	https://mechanicalc.com/reference/engineering-materials
5.	http://ndl.ethernet.edu.et/bitstream/123456789/89589/1/%5BPerez_N.%5D_Electrochemistry_and_corrosion%28BookZZ.org%2 9.pdf

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3 2 2 2											-	-	-	-	
2	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-	
3	3	2	3	2	-	-	-	-	-	-	-	-	-	-	-	
4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Cont	inuous Asse	essment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	Mech	anical E	ngineering	Progr	Programme : B.Tech.								
Semester	I			Cours	e Categ	ory: ES	End	Seme	əster E	Exam Ty	/pe: TE		
Course	1122	STCUS		Pe	riods/W	eek	Credit	١	Maxim	um Mar	[.] ks		
Code	UZJE	31002		L	Т	Р	С	CAN	V I	ESE	тм		
Course Name	ENGI	NEERING	B MECHANICS	2	1	-	3	25		75	100		
		(Common to EEE, ECE, N	∕IECH, CIVII	., Mecha	atronics E	Branches)						
Prerequisite	Engin	eering Ph	iysics						······				
	On co	mpletion	of the course, the stud	lents will be	e able to)				BT Ma (Highes	ipping t Level)		
	CO1	Recogn	ize the basics of equilibrium	of particles i	n 2D and	3D				K	2		
Course	CO2	Review	the requirements of equilibr	ium of rigid b	odies in 2	2D and 3D).			K	2		
Outcome	CO3	Solve p	roblem related to friction for	ce.						K	3		
	CO4	Comput	e the center of mass and m	oment of iner	tia of sur	faces and	solids.			K	3		
	CO5	Predict	displacement, velocity and a	acceleration c	f dynami	c particles	5.			K	3		
UNIT- I	Basic	s and St	atics of Particles					F	Perioc	ds: 09			
Introduction · Parallelogran Equivalent sy	ntroduction - Units and Dimensions - Vectorial representation of forces and moments – Coplanar Forces - Lami's theorem, Parallelogram and triangular Law of forces - Resolution of forces - Equilibrium of a particle - Principle of transmissibility - Equivalent system of force - Free body diagram												
UNIT- II	UNIT- II Equilibrium of Rigid Bodies Periods: 09												
theorem - Eq systems of UNIT - III	uilibrium forces - Struct	of Rigid b Equilibriur	oodies in two dimensions – n of Rigid bodies in three di Ilysis of Trusses and Fi	Forces in spa mensions (De riction	ce -Equil escriptive	librium of a only).	a particle in	ו spa ו	ce - Ec Perioc	quivalent	CO2		
Laws of slidir	inition o	r a truss - n - equilibr	Simple Trusses - Analysis of ium analysis of simple syste	ems with slidi	ng frictior	joints - M n -wedge f	ethod of sec riction- Rolli	ng resi	Frictio	on force - e.	CO3		
UNIT - IV	Prope	rties of \$	Surfaces and Solids					F	Perioc	ds: 09			
Determinatio areas- Parall inertia.	n of cen el axis th	troid of ar neorem an	eas, volumes and mass - F d perpendicular axis theore	Pappus and C em, radius of g	Guldinus gyration o	theorems of area- pr	- moment c oduct of ine	f inerti rtia- m	a of pl ass mo	lane and oment of	CO4		
UNIT - V	Dynai	nics of F	Particles					ſ	Perioc	ds: 09	ki		
Displacemen Energy Equa	ts, Veloo tion of p	city and a articles -In	cceleration, their relationsh npulse and Momentum -Imp	ip - Relative bact of elastic	motion - bodies.	Curvilinea	ar motion -	Newto	n's law	v - Work	CO5		
Lecture Pe	riods:	30	Tutorial Periods: 15	Practio	cal Perio	ods: -		٦	Total	Periods	:: 45		
Text Books													
1. Beer, and	Johnsto	n Jr. E.R.	"Vector Mechanics for Engi	ineers", McGr	aw-Hill E	ducation I	ndia Pvt Ltd	., 11th	Editior	n, 2016.			
2. J.L. Meria	m & L.G	. Karidge,	Engineering Volume I and E	Ingineering M	echanics	: Dynamic	s, 8th editior	ı, Wiley	y stude	ent editio	n, 2016.		
3. R.C, Hibb	eller, "Er	ngineering	Mechanics", Prentice Hall,	14th edition,	2016.								
1 Arthur P	Boresi	and Rich	ard I Schmidt "Engineeri	ing Mechanic	s Statio	s and Dv	namics" Th	omsor	n Asia	Private	limited		
Singapore	e, 2010.								. , , , , , , , , , , , , , , , , , , ,				
2. D.P.Shar	na "Eng	neering M	echanics", Dorling Kindersl	ey India Pvt. I	td, New	Delhi, 201	10						
3. S.Rajasel	karan, Sa	ankarasub	ramanian, G., Fundamenta	Is of Enginee	ing Mech	nanics, Vik	as Publishir	ng Hou	ise Pvt	., Ltd., 20	J12.		
4. S.S.Bhav	Katti and	I K.G. Raja	asnekarappa, Engineering N	viecnanics, N	ew Age II		$a_1(P)$ Ltd, Ne	w Del	ini, 7th	Edition,	2019.		
	aı, ⊏ng		icchanical second equion,	Laksiiiii PUD	ication (F	-), ∟lū., 20							
	Liitm oo	in/video n	hn2cubiectId_112102100										
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COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	
2	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	
3	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	
4	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	
5	3	2	2	3	-	-	-	-	-	-	-	1	2	-	2	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Assossment		Cor	itinuous Assessi		End Semester	Total	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	(ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	EEE and ECE Programme : B.Tech.											
Semester	I		Cours	e Categ	ory: ES	End	Semester	ter Exam Type: TE				
Course	U23E	STC03	Pe	riods/W	eek	Credit	Max	imum Ma	arks			
Code			L	Т	Р	С	CAM	ESE	ТМ			
Course Name	BAS ELE	ICS OF ELECTRICAL AND CTRONICS ENGINEERING	3	-	-	3	25	75	100			
	(Co	ommon to CSE, IT, MECH, CIVIL, MC	TR, CC	E, AI&C	OS, FT an	d CSBS E	Branches)					
Prerequisite	Mathe	ematics and Physics							•			
	On co	mpletion of the course, the students	s will be	able to)			Highe	apping st Level)			
	C01	Apply the basic concepts and various law	s in DC (circuits.				I	٨3			
Course	CO2	Analyze the AC circuits and develop recircuits.	esonance	e conditio	ons for tra	ansmitter a	nd receive	r I	٨3			
Outcome	CO3	Gain the knowledge of power system com and real time applications of transformer a	ponents and moto	, importa or.	nce of ele	ctrical safet	y measures	3	K2			
	CO4	Understand the operator of semiconducto	or diode a	and its ap	plications.				٨2			
	CO5	Explain the characteristics and operation		I	K2							
CO6 Relate and Explain Different Communication Systems.												
		SECTION A - Ele	ectrical	Enginee	ering			_				
UNIT- I	DC C	ircuits					Peri	ods: 08				
UNIT- II AC waveform in polar and r Resonance i Power Meas	AC Ci n definition rectangu n series urement	ircuits ons - form factor, peak factor, R-L, R-C, RL lar form, concept of impedance, admittance and parallel circuits, band-width and qualit – Two Wattmeter method.	C series , active, y factor,	circuit, l reactive, Three P	R-L-C para apparent a hase balar	and complex and complex nced AC Ci	Peri phasor rep x power, pc rcuits (Υ-Δ	ods: 08 resentatio ower factor and Y-Y)	n r, - CO2			
UNIT- III	Elect	rical Safety and Electrical Machines					Peri	ods: 07				
Layout of ele	ectrical p d cables	ower system and its functions, Wiring Act, Safety devices - fuse, relay and circuit bre	cessorie eaker - S	s, Types ensors a	of domes and its type	tic wiring, I s.	Vecessity of	of earthing	J,			
Faraday's La principle, loa test - Single	aw of eleo d test an phase ca	ctromagnetic induction, Fleming's Right and d performance characteristics - Auto transfo apacitor start and run induction motor – Loa	d Left ha ormer, S ad test.	nd rule - ingle pha	DC Generation	ator and DC rmer- const	C Motor - co ruction, pri	onstructior nciple, loa	n, CO3 d			
		SECTION B – Elec	tronics	Engine	ering				i			
UNIT- IV	Semi	conductor Diodes and Applications					Peri	ods: 07				
Introduction characteristic - zener diode	semicon cs - diffus e as regu	ductor materials – Doping - Intrinsic and sion and depletion capacitance - Rectifier, H lator – Light Emitting Diode (LED) - Solar C	d Extrins Half wave Cell.	ic Semi and Ful	conductor I wave rec	 PN junc tifier - zene 	tion diode r diode cha	, structure racteristic	», s CO4			
UNIT- V	Trans	istors					Peri	ods: 07				
Bipolar Junc characteristic Effect Transi	tion Tran cs – Bias stor, EM	sistor - construction – operation - Commor sing - numerical application. Junction Field OSFET-DMOSFET operation characteristic	n Base, (d Effect ⁻ cs - Num	Common Fransisto erical ap	Emitter, C r (JFET), plication.	ommon col Metal oxide	lector Cont semicond	figuration uctor Fiel	d CO5			
UNIT- VI	Comr	nunication systems					Peri	ods: 08				
Need for Mo Comparison Spectrum. W	odulation of digital /ired and	 Block diagram of analog communicat and analog communication system- Block wireless Channel – Block diagram of co 	ion Syst diagram	em - AN of digita ation sys	M, FM, PM I communi atems – sa	/ Definition cation syste	is and Wa em – Electr munication	veforms - omagnetic – Cellula	- c r CO6			

Mobile Communication – Fibre Optical Communication System.

Тех	t Books
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Refe	erence Books
1.	A. Sudhakar and S. P. Shyam Mohan, "Circuits and Networks: Analysis and Synthesis", Tata McGraw Hill Publishing Company Ltd., New Delhi, 4 th Edition, 2017.
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4.	David. A. Bell, "Electronic Devices and Circuits", PHI Learning Private Ltd, India, Fourth Edition, 2020
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Web	o References
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4.	https://onlinecourses.nptel.ac.in/noc21_ee55/
5.	https://nptel.ac.in/courses/117/102/117102059

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	3	3	-	2	-	-	-	-	-	-	1	3	2	-	
2	3	3	3	-	2	-	-	-	-	-	-	1	3	2	-	
3	3	3	3	-	2	-	-	-	-	-	-	1	3	2	-	
4	3	3	3	-	2	-	-	-	-	-	-	1	3	2	-	
5	3	3	3	-	2	-	-	-	-	-	-	1	3	2	-	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Accessment		Cor	ntinuous Assessi		End Semester	Total	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	(ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Semester I Course Category: PC End Semester Exam Type: TE Course U23MET101 Periods/Weak Credit Maximum Marks Course CONCEPT OF ENGINEERING DESIGN 3 - 3 25 75 100 Name To provide a board overview of generic concept of design, weld symbols and standards. - 3 25 75 100 Prerequisite Material Science To provide a board overview of generic concept of design, weld symbols and standards. - 3 25 75 100 Course To anabie students to attain knowledge on design principles. - 3 25 To anabie students to attain knowledge on design principles. - 10 For principles (Level) 01 Inderstand the concepts of work, energy, torque, power and free body diagrams. K2 Course CO1 Understand the concepts of work, energy, torque, power and free body diagrams. K3 Outcome CO3 Explain different classes of work, energy, torque, power. K3 CO4 Illustrate the various bading and failures theory methods. K3 CO5 E	Department	Mech	nanical		Progr	amme	B.Tech.							
Course U23MET101 Perioda/Week Credit Maximum Marks Code CONCEPT OF ENGINEERING DESIGN 3 - 3 25 75 100 Prerequisite Material Science To enable students to attain knowledge on design principles. - 3 25 75 100 Course To enable students to attain knowledge on design principles. - 3 25 75 100 Course To enable students to attain knowledge on design principles. - 3 25 75 100 Objectives To define various engineening materials and properties. - 6 (Highest Lovel) Out Understand various design principles. K2 - K2 Outcome CO3 Explain different classes of material and their properties. K3 - K3 Co4 Illustrate the various loading and failures theory methods. K3 - K3 Co4 Explain different classes of material and their properties. K3 - - - - - - -	Semester	I			Cours	e Cate	gory: PC	End Se	emester E	Exam Typ	e: TE			
Code Connection L T P C CAM ESE TM Course CONCEPT OF ENGINEERING DESIGN 3 - 3 25 75 100 Name To provide a board overview of generic concept of design, weld symbols and standards. - 3 25 75 100 Course To enable students to attain knowledge on design principles. - - 3 25 75 100 Course To enable students to attain knowledge on design principles. - <t< td=""><td>Course</td><td>11231</td><td></td><td></td><td>Pe</td><td>riods/M</td><td>/eek</td><td>Credit</td><td>Max</td><td>kimum Ma</td><td>arks</td></t<>	Course	11231			Pe	riods/M	/eek	Credit	Max	kimum Ma	arks			
Course Name CONCEPT OF ENGINEERING DESIGN 3 . 3 25 75 100 Prerequisite Name Material Science To provide a board overview of generic concept of design, weld symbols and standards. To enable students to attain knowledge on design principles. To expand in depth knowledge on stress, strain and various loading conditions. To cherow atoxics engineering metaricials and properties. BT Mapping (Highest Level) Course On completion of the course, the students will be able to Course BT Mapping (Highest Level) Course Coil Understand various design principles. Coil K2 Outcome Coil Explain different classes of material and their properties. Coil K3 Outcome Coil Explain different classes of material and their properties. Coil Periods: 9 Outcome Design Consideration Ris Periods: 9 Outcome Design Terminology Periods: 9 Periods: 9 Outcome Design Terminology Periods: 9 Corativity in thoses	Code	0251			L	Т	Р	С	CAM	ESE	ТМ			
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C04 Illustrate the various loading and failures theory methods. K3 C05 Exposed to light engineering product and green design process. K3 UNIT-1 Design Consideration Periods: 9 Review of basics of work, energy, torque, power, load analysis, equilibrium equations, free-body diagrams, internal loads, force flow concept, locating critical sections, practical considerations, Fits and tolerances, surface roughness, basic of weld symbols. C01 UNIT-1 Design Terminology Periods: 9 Definition-various methods and forms of design-importance of product design-static and dynamic products-various design projects-morphology of design-requirements of a good design-concurrent engineering-computer aided engineering-codes and standards-product and process cycles-bench marking C02 UNIT-1II Creativity in Design Periods: 9 Creativity and problem solving-vertical and lateral thinking-invention-psychological view, mental blocks-Creativity methods-brainstoming, synectics, force fitting methods, mind map, concept map Theory of innovative problem solving (TRIZ) - conceptual decomposition creating design concepts Periods: 9 Configurering materials and their classification: Metals. Ceramics and polymers, Stress-strain diagrams of metallic. Ceramics and polymers materials, Moduil of elasticity, Poisson's ratio, shear modulus - material strength, resilience and toughness, and polymers, stress-strain diagrams of metallic. Ceramics and polymers materials. Material saving by form design, possible weight and cost reduction,	Outcome	CO3	Explain d	ifferent classes of material and	their prop	erties.				I	K 3			
CO5 Exposed to light engineering product and green design process. K3 UNIT-1 Design Consideration Periods: 9 Review of basics of work, energy, torque, power, load analysis, equilibrium equations, free-body diagrams, internal loads, force flow concept, locating critical sections, practical considerations, Fits and tolerances, surface roughness, basic of weld symbols. C01 UNIT-11 Design Terminology Periods: 9 Definition-various methods and forms of design-importance of product design-static and dynamic products-various design projects-morphology of design-requirements of a good design-concurrent engineering-computer aided engineering-codes and standards-product and problem solving-vertical and lateral thinking-invention-psychological view, mental blocks/creativity methods-brainstorming, synectics, force fitting methods, mind map, concept map Theory of innovative problem solving (TRI2) – conceptual decomposition creating design concepts. C03 UNIT-1V Materials and Their Properties Periods: 9 C03 Comparison of materials, Moduli of elasticity, Poisson's ratio, shear modulus – material strength, resilience and toughness, thermal conductivity, linear thermal expansion coefficient, specific heat capacity. C04 UNIT-V Green Design Process Periods: 9 Cotal Periods: 9 Comparison of materials, Material life cycle, embodied energy, 80-20 rule, carbon footprint, green design in industry, sustainability. C04 UNIT-V	Catoonio	CO4	Illustrate	the various loading and failures	s theory m	ethods.					K 3			
UNIT- I Design Consideration Periods: 9 Review of basics of work, energy, torque, power, load analysis, equilibrium equations, free-body diagrams, internal loads, force flow concept, locating critical sections, practical considerations, Fits and tolerances, surface roughness, basic of weld symbols. CO1 UNIT- II Design Terminology Periods: 9 Definition-various methods and forms of design-importance of product design-computer aided engineering-codes and standards-product and process cycles-bench marking CO2 UNIT- III Creativity in Design Periods: 9 Creativity and problem solving-vertical and lateral thinking-invention-psychological view, mental blocks-Creativity methods-brainstorming, synectics, force fitting methods, mind map, concept map Theory of innovative problem solving (TRI2) – conceptual decomposition creating design concepts. Periods: 9 UNIT- IV Materials and Their Properties Periods: 9 Engineering materials, Moduli of elasticity. Poisson's ratio, shear modulus – material strength, resilience and toughness, thermal conductivity, linear thermal expansion coefficient, specific heat capacity. CO4 UNIT- V Green Design Process Periods: 9 Comparison of materials, material saving by form design, possible weight and cost reduction, design concepts for light engineering products. Material life cycle, embodied energy, 80-20 rule, carbon footprint, green design in industry, sustainability. Co5 Lecture Peri		CO5	Exposed	to light engineering product and	d green de	esign pro	ocess.				K 3			
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UNIT- V Green Design Process Periods: 9 Comparison of materials, material saving by form design, possible weight and cost reduction, design concepts for light engineering products, Material life cycle, embodied energy, 80-20 rule, carbon footprint, green design in industry, sustainability. Co5 Lecture Periods: 45 Tutorial Periods: - Practical Periods: - Total Periods: 45 Text Books 1. Dieter, George E., Engineering Design - "A Materials and Processing Approach", McGraw Hill International Editions Singapore, 3rd Edition, 2000. 2. Horenstein, M. N., Design Concepts for Engineers, Prentice Hall, 2010 3. Attif Aziz. "Concepts in Engineering Design" 1st Edition, New Age International, 2017. Reference Books 1. Michael Ashby, Hugh Shercliff and David Cebon, "Materials Engineering, Science, Processing and Design", Butterworth Heinemann, 2009. 2. Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. 3. 3. George Dieter, Linda Schmidt, "Engineering Design ' Fifth Edition McGraw 2012. 4. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. 5. Aarron Walter," Principles of product design' Design better, 2019 Web References	Engineering m and polymers thermal condu	naterials materia ictivity, li	and their Ils, Moduli inear therm	classification: Metals, Ceramic of elasticity, Poisson's ratio, s nal expansion coefficient, speci	s and pol hear mod fic heat ca	ymers, S ulus – r apacity.	Stress-strain material stre	n diagrams ength, resili	of metallic ence and	ceramic toughness	s ^{;,} CO4			
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 Text Books Dieter, George E., Engineering Design - "A Materials and Processing Approach", McGraw Hill International Editions Singapore, 3rd Edition, 2000. Horenstein, M. N., Design Concepts for Engineers, Prentice Hall, 2010 Atif Aziz. "Concepts in Engineering Design" 1st Edition, New Age International, 2017. Reference Books Michael Ashby, Hugh Shercliff and David Cebon, "Materials Engineering, Science, Processing and Design", Butterworth Heinemann, 2009. Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. George Dieter,Linda Schmidt, "Engineering Design ' Fifth Edition McGraw 2012. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. Aarron Walter," Principles of product design' Design better, 2019 	Lecture Per	iods: 4	5	Tutorial Periods: -	Practi	cal Per	iods: -		Tota	I Periods	: 45			
 3rd Edition, 2000. Horenstein, M. N., Design Concepts for Engineers, Prentice Hall, 2010 Atif Aziz. "Concepts in Engineering Design" 1st Edition, New Age International, 2017. Reference Books Michael Ashby, Hugh Shercliff and David Cebon, "Materials Engineering, Science, Processing and Design", Butterworth Heinemann, 2009. Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. George Dieter,Linda Schmidt, "Engineering Design' fifth Edition McGraw 2012. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. Aarron Walter," Principles of product design' Design better, 2019 	Text Books1.Dieter, Ge	eorge E.	., Engineer	ing Design - "A Materials and	Processir	g Appro	bach", McGi	raw Hill Inte	rnational I	Editions Si	ngapore,			
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 Reference Books 1. Michael Ashby, Hugh Shercliff and David Cebon, "Materials Engineering, Science, Processing and Design", Butterworth Heinemann, 2009. 2. Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. 3. George Dieter,Linda Schmidt, "Engineering Design' ' Fifth Edition McGraw 2012. 4. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. 5. Aarron Walter," Principles of product design' Design better, 2019 Web References 	3. Atif Aziz	"Concer	ots in Fnair	neering Design" 1st Edition. Ne	w Age Int	ernation	al. 2017.							
 Michael Ashby, Hugh Shercliff and David Cebon, "Materials Engineering, Science, Processing and Design", Butterworth Heinemann, 2009. Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. George Dieter,Linda Schmidt, "Engineering Design' ' Fifth Edition McGraw 2012. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. Aarron Walter," Principles of product design' Design better, 2019 Web References 	Reference B	ooks			in igo inc	omation								
 Robert C Juvinall, "Fundamentals of Machine Component Design", Wiley, 2011. George Dieter,Linda Schmidt, "Engineering Design' ' Fifth Edition McGraw 2012. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. Aarron Walter," Principles of product design' Design better, 2019 Web References 	1. Michael A Heinemar	Ashby, nn, 2009	Hugh She).	rcliff and David Cebon, "Mat	terials En	gineerin	g, Science	, Processir	g and De	esign", Bu	tterworth			
 George Dieter, Linda Schmidt, "Engineering Design" Fifth Edition McGraw 2012. Yousef Haik, Tamer M. Shahin, "Engineering Design Process" Second Edition .Cengage learning, 2016. Aarron Walter," Principles of product design' Design better, 2019 Web References 	2. Robert C	Juvinall,	, "Fundame	entals of Machine Component	Jesign", V	/iley, 20	11.							
 4. Touser main, rameri vi. Snamin, Engineering Design Process Second Edition Cengage learning, 2016. 5. Aarron Walter," Principles of product design' Design better, 2019 Web References 	3. George D	ieter,Lin	aa Schmid	it, "Engineering Design" Fifth I		Graw 20	UTZ.	o loorning (0016					
Web References	4. YOUSET Ha	aik, Tam alter " P	rinciples of	Inn, Engineering Design Proce	2010		. cengag	e learning, 2	.010.					
	Web Referer			Product design Design Deller	, 2013									

1.	nptel.ac.in/courses/107/108/107108010/
2.	https://nptel.ac.in/courses/113/104/113104096/
3.	https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-842
4.	https://www.ifeu.de/en/methods/life-cycle-assessment-and-material-flow-analyses
5.	https://www.webdesignerdepot.com/2011/02/the-8020-rule-applied-to-web-design

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	2	1	1	-	2	1	1	1	1	1	2	2	1	1	
2	3	1	1	1	-	1	1	1	2	1	1	2	2	2	2	
3	3	2	1	1	-	2	2	1	2	1	1	2	2	2	3	
4	3	1	1	1	-	1	1	1	2	1	1	2	2	2	2	
5	3	1	1	1	-	2	2	2	1	1	2	2	3	3	3	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Accessment		Cor	ntinuous Assess		End Semester	Total	
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	(ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

* Application oriented / Problem solving / Design / Analytical in content beyond the syllabus

Department	English	Progra	mme :	B.Tech.							
Semester		Course	Categ	ory: HS	End	Semest	er Exam T	ype: TE			
Course	U23ENBC01	Per	iods/W	eek	Credit	Max	kimum Ma	ırks			
Code		L	Т	Р	С	CAM	ESE	ТМ			
Course Name	COMMUNICATIVE ENGLISH - I	2	-	2	3	50	50	100			
	(Common to ALL B	ranches	except	CSBS)							
Prerequisite	Basics of English Language						BTM	anning			
	On completion of the course, the students	s will be	able to	0			(Highe	apping st Level)			
	CO1 Understand the communication flow in or	ganizatio	n and its	objectives	3		({2			
Course	CO2 Write the technical contents with gramma	tically pre	cise sei	ntences				(2			
Outcome	CO3 Articulate with correct pronunciation and	overcome	vernac	ular impac	t in speakin	g		(3			
Outcome	CO4 Express opinions confidently in formal an	d informa	l commi	unicative c	ontexts			(2			
	CO5 Attend interview with assertiveness										
UNIT- I	Workstead Communication					Per	iods: 10	U .			
Communicatio	n. Definition. Process. Channels. Barriers. Strat	eaies for	Effectiv	/e Commi	unication. V	erbal and	Nonverba	1			
Communicatio	n - Listening, Types, Barriers, Enhancing Listening) Skills - E	ibliogra	phy: Book	Journal and	d Internet	Reference	s CO1			
	Common Erroro In Writing And Compreh	oncion (trotog	iaa		Bai	iada: 10				
Subject Verb	Agreement, Misplaced Modifiers, Squinting Modi	ifiers, Da	ngling N	Aodifier, F	used Sente	nce, Com	ma Splice	,			
Sentence Frag	ment - Reading Comprehension: Technical passa	ge, Strate	gies: Sk	kimming, S	canning, Int	ensive an	d Extensive	[•] CO2			
Reading, Pred	iction, and Contextual Meaning							002			
UNIT- III	Phonetics					Per	iods: 10	i			
Pronunciation	Guidelines to consonants and vowels. Sounds Misr	vronounce	d Silon	t and Non-	silont Lattor	e Intonati	on Spellin	7			
Rules and Wo	rds often misspelled, Mother Tongue Influence (MT	FI), Variou	is Techr	niques for	Neutralizatio	on of Moth	ier Tongue	CO3			
UNIT- IV	Communication Practice - I					Per	iods: 15				
List of Exerci	ses										
Speaking: Se	If-Introduction, Extempore, and Role Play										
Reading: Non	-Technical Comprehension Passage							C04			
Writing: Com	mon Errors in Writing										
UNIT- V	Interpersonal Communication - I					Per	iods: 15				
List of Exerci	ses					k					
Listening: Sp	eech Sounds, Interview Videos	ion									
Reading: Con	nmonly Confused Words	.1011						CO5			
Writing: Tran	scription										
Lactura Par	inds: 30 Tutorial Periods: -	Practic	al Pori	ods: 30		Tota	l Periods	· 60			
Text Books		Traotio		043.00		1014					
1. Richa Mish	ra , RatnaRao, "A textbook of English Language Co	ommunica	tion Skil	ls", Macmi	llan Publish	ers India F	Private Ltd.,	Revised			
Edition 202											
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Wob Poforor	ICES										

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COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-	
2	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-	
3	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-	
4	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-	
5	1	-	-	-	-	-	-	-	1	3	-	1	-	-	-	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Theory											
	Conti	nuous Ass	sessment Marks	(CAM)	End Semester						
Assessment	CAT 1 CAT 2 Model Exam		Attendance	Examination (ESE) Marks	Total Marks						
Marka	5	5	5	5	75	60					
IVIAINS	20) (to be we	ighted for 10 mar	ˈks)	(to be weighted for 50 marks)	00					

Practical										
Continuous Assessment	Internal Evaluation	ster Internal Evaluation	Total Marks							
30 (to be weighte	ed for 10 marks)		30 marks							
Listening (L)*	10	Listening (L)*	10							
Speaking(S)	5	Speaking(S)	5	40						
Reading(R)*	10	Reading(R)*	10							
Writing(W)*	5	Writing(W)*	5							

LRW components of Practical can be evaluated through Language Lab Software

Department	EEE/	ECE		Progr	amme :	B.Tech.					
Semester	I			Course Category: ES End Semester Exam Type: LE							
Course				Pe	riods/W	eek	Credit	Ma	ximum M	arks	
Code	U23E	EPC01		L	Т	Р	С	CAM	ESE	ТМ	
Course Name	BASI ELEC LABC	CS OF EL TRONICS RATORY	ECTRICAL AND SENGINEERING	-	-	2	1	50	50	100	
		(Common	to CSE, IT, MECH, CIV	IL, CCE, A	I&DS, F	T, MCTR	, CSBS Bra	anches)			
Prerequisite	Basic	Knowledg	ge of Science								
	On co	mpletion	of the course, the stude	ents will be	e able to	D			BT N (Highe	1apping est Level)	
	CO1	Build the	different wiring for domestic	and comme	rcial app	lications.				K3	
	CO2	Design ar	nd analyze the domestic pov	ver distribution	on.					K3	
Course	CO3	Estimate	the performance of transforr	mer and mot	ors by co	nducting l	oad test.			K3	
Outcome	CO4	Describe	characteristics of semicondu	uctor diode a	nd utilize	e it for diffe	rent applica	itions		K5	
	C:05	Relate the	e characteristics of various t	ransistor						KJ K2	
	CO6	Understa	nd Rectifiers and Regulators	5						K2	
List of Exp	orimont	e								NZ	
	ennent	3	Section – A I	Electrical E	xperim	ents					
Engineering 1. Electric: 2. Domest 3. Design 4. Measure 5. Load te 6. Load te 7. Load te 1. Study o 2. Measure 3. VI Char 4. Input ar 5. Charact 6. Measure 7. Voltage	Lab. al safety fic Wiring Stairca Doctor' Godow Wiring of Domes ement of st on DC st on sing st on sing f Electror ement of acteristic id output eristics o ement of Regulato	precautions Practice se wiring s room wiring of Ceiling f stic power of 3-phase po shunt moto gle phase to gle phase to gl	s and study of tools, accesso ing an, LED lamps and Iron Box distribution. ower using two wattmeter m or. ransformer. nduction Motor. Section – B E ents and equipment: Resisto parameter (Peak-Peak, rms iction diode, Zener diode stics of Common Emitter cor tor of HWR, FWR	ories, electric c. ethod Electronics or, Capacitor period, frequ	Experin uency) us BJT	and electri ments sing CRO.	cal symbols				
			ner Diode								
Reference F	.ous		ner Diode	Practic	al Pori	nds. 30		Tota	l Periode	× 30	
	Books	•••••••••••••••••••••••••••••••••••••••	ner Diode Tutorial Periods: -	Practio	cal Perio	ods: 30		Tota	I Periods	5: 30	
1 S Gowri	Books T.Jeva	poovan Na	ner Diode Tutorial Periods: -	Practio	cal Perio	ods: 30	n House Pri	Tota	I Periods	s: 30	
1. S. Gowri Edition, 2 2. A.Sudha	Books , T. Jeya 2014. kar and S	poovan Na Shyam Moh	ner Diode Tutorial Periods: - adar, "Engineering Practices an.S.P. "Circuits and Netwo	Practions Lab Manua	al Perio	ods: 30 Publishing	g House Pri ta McGraw	Tota ivate Limi Hill Publis	ted, New	5: 30 Delhi, 5th	
1. S. Gowri Edition, 2 2. A.Sudha New Dell	Books , T. Jeya 2014. kar and S ni, 4 th edi	poovan Na Shyam Moh tion, 2017.	ner Diode Tutorial Periods: - adar, "Engineering Practices an.S.P, "Circuits and Netwo "Electric Machines" Tata N	Practions Lab Manua	and Syn	Publishing thesis", Ta	g House Pri ta McGraw	Tota ivate Limi Hill Publis	Il Periods	5: 30 Delhi, 5th Dany Ltd.,	
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 S. Gowri Edition, 2 A.Sudha New Dell D.P.Koth Edward H New Dell S.K. Sah Web Reference http://eie 	Books , T. Jeya 2014. kar and S hi, 4 th edi ari and I. Hughes, S hi, 12 th e dev, "Fur es sliet.ac.in	poovan Na shyam Moh tion, 2017. J. Nagrath John Hiley, edition 2010 ndamentals	ner Diode Tutorial Periods: - adar, "Engineering Practices an.S.P, "Circuits and Netwo , "Electric Machines", Tata M Keith Brown, Ian McKenzie S 6. 5 of Electrical Engineering ar ies/basic-electrical-engineer	Practions Lab Manual rks Analysis McGraw Hill, Smith, Electronic and Electronic	cal Perio I", Vikas and Syn New Dell ical and f s", Dhan	ods: 30 Publishing thesis", Ta hi, 5 th Editi Electronics patRai and	g House Pri ta McGraw on, 2017. Technolog I Co, 2017.	Tota ivate Limi Hill Publis y, Pearsor	I Periods ted, New I hing Com	5: 30 Delhi, 5th Dany Ltd., n Limited,	
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 S. Gowri Edition, 2 A.Sudha New Dell D.P.Koth Edward H New Dell S.K. Sah Web Reference http://eie https://ww https://ww https://ww https://ww 	Books , T. Jeya 2014. kar and S hi, 4 th edi ari and I. Hughes, J hi, 12 th e dev, "Fur es sliet.ac.in ww.electr ww.allabo	poovan Na Shyam Moh tion, 2017. J. Nagrath Iohn Hiley, edition 2010 ndamentals n/laboratori onics-tutor putcircuits.co	ner Diode Tutorial Periods: - adar, "Engineering Practices an.S.P, "Circuits and Netwo , "Electric Machines", Tata M Keith Brown, Ian McKenzie S 6. s of Electrical Engineering ar ies/basic-electrical-engineer ials.ws/accircuits/series-circ com/textbook/experiments/ org/measurements-of-ac-curr	Practions Lab Manua rks Analysis AcGraw Hill, Smith, Electronic ing-lab/ uit.html	cal Perio I", Vikas and Syn New Dell ical and f s", Dhan	ods: 30 Publishing thesis", Ta hi, 5 th Editi Electronics patRai and	g House Pri ta McGraw on, 2017. Technology I Co, 2017.	Tota ivate Limi Hill Publis y, Pearsor	I Periods ted, New I hing Com	5: 30 Delhi, 5th Dany Ltd., n Limited,	

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	2	3	-	-	1	-	-	3	-	-	1	3	2	-	
2	3	2	3	-	-	1	-	-	3	-	-	1	3	2	-	
3	3	2	3	-	-	1	-	-	3	-	-	1	3	2	-	
4	3	2	3	-	-	1	-	-	3	-	-	1	3	2	-	
5	3	2	3	-	-	1	-	-	3	-	-	1	3	2	-	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

	Co	ontinuous /)				
Assessment	Performance clas	e in Practic sses	al	Model		End Semester Examination (ESE)	Total Marks
	Conduction of Practical	Record work	viva	Practical Examination	Attendance	Marks	indino
Marks	15	5	5	15	10	50	100

Department	Mech	anical Engineering	Programme : B.Tech.										
Semester	I		Cours	e Categ	ory: ES	End	Semester	Exam ⁻	Гуре: LE				
Course			Periods/Week Credit Max						mum Marks				
Code	U23E	SPC02	L	Т	Р	С	CAM	ESE	ТМ				
Course Name	DESI	GN THINKING AND IDEA LAB	-	-	2	1	50	50	100				
	•	(Common to ALL Branches)											
Prerequisite	Basic	Knowledge of Science											
	On completion of the course, the students will be able to												
	CO1	Demonstrate a comprehensive understan IDEA Lab.		K2									
	CO2	Develop proficiency in ideation techniques to generate creative and innovative solutions for various design challenges and problems											
Course Outcome	CO3	Acquire practical knowledge of mechanical and electronic fabrication processes, including hands-on experience with machinery, tools, and techniques used in the manufacturing and assembly of physical components.											
	CO4	Cultivate the skills necessary for developin ability to integrate user needs, market t design process.	ng innova rends, a	ative and nd techr	desirable nological a	products, in advancemer	cluding the its into the	K4					
	CO5	Apply iterative design methodologies to refine and improve solutions based on feedback, user testing, and evaluation of functional, aesthetic, and usability aspects											

Design process: Traditional design, Design thinking, Existing sample design projects, Study on designs around us, Compositions/structure of a design, Innovative design: Breaking of patterns, Reframe existing design problems, Principles of creativity Empathy: Customer Needs, Insight-leaving from the lives of others/standing on the shoes of others, Observation

Design team-Team formation, Conceptualization: Visual thinking, Drawing/sketching, New concept thinking, Patents and Intellectual Property, Concept Generation Methodologies, Concept Selection, Concept Testing, Opportunity identification Prototyping: Principles of prototyping, Prototyping technologies, Prototype using simple things, Wooden model, Clay model, 3D printing; Experimenting/testing.

Sustainable product design, Ergonomics, Semantics, Entrepreneurship/business ideas, Product Data Specification, Establishing target specifications, Setting the final specifications. Design projects for teams.

List of Lab Activities and Experiments

- 1. Schematic and PCB layout design of a suitable circuit, fabrication and testing of the circuit.
- 2. Machining of 3D geometry on soft material such as softwood or modelling wax.
- 3. 3D scanning of computer mouse geometry surface. 3D printing of scanned geometry using FDM or SLA printer.
- 4. 2D profile cutting of press fit box/casing in acrylic (3 or 6 mm thickness)/cardboard, MDF (2 mm) board using laser cutter & engraver.
- 5. 2D profile cutting on plywood /MDF (6-12 mm) for press fit designs.
- 6. Familiarity and use of welding equipment.
- 7. Familiarity and use of normal and wood lathe.
- 8. Embedded programming using Arduino and/or Raspberry Pi.
- 9. Design and implementation of a capstone project involving embedded hardware, software and machined or 3D printed enclosure.
- 10. Discussion and implementation of a mini project.
- 11. Documentation of the mini project (Report and video).

Le	cture Periods: -	Tutorial Periods: -	Practical Periods: 30	Total Periods: 30
Тех	t Books			
1.	Tim Brown, Change by Desig	n: How Design Thinking Transfo	orms Organizations and Inspires Innovation,	HarperCollins Publishers
	Ltd			
2.	Workshop / Manufacturing F	Practices (with Lab Manual), Kha	nna Book Publishing.	

Reference Books

- 1. Ulrich and Eppinger, Product Design and Development, 3rd Edition, McGraw Hill, 2004
- 2. The Big Book of Maker Skills: Tools & Techniques for Building Great Tech Projects. Chris Hackett. Weldon Owen; 2018.
- 3. The Total Inventors Manual (Popular Science): Transform Your Idea into a Top-Selling Product. Sean Michael Ragan, Weldon Owen; 2017.
- 4. The Art of Electronics. 3rd edition. Paul Horowitz and Winfield Hill. Cambridge University Press.
- 5. Practical Electronics for Inventors. 4th edition. Paul Sherz and Simon Monk. McGraw Hill.
- 6. Make Your Own PCBs with EAGLE: From Schematic Designs to Finished Boards. Simon Monk and Duncan Amos. McGraw Hill Education.
- 7. Programming Arduino: Getting Started with Sketches. 2nd edition. Simon Monk. McGraw Hill.
- 8. Venuvinod, PK., MA. W., Rapid Prototyping Laser Based and Other Technologies, Kluwer
- 9. Chapman W.A.J, "Workshop Technology", Volume I, II, III, CBS Publishers and Distributors, 5th Edition, 2002.

Web References

1. https://onlinecourses.nptel.ac.in/noc23_mg72

COs/POs/PSOs Mapping

COs		Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
1	3	2	2	2	2	2	-	-	2	-	3	2	-	-	-		
2	3	3	3	2	2	2	-	-	2	-	3	2	-	-	-		
3	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-		
4	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-		
5	3	3	3	2	3	2	-	-	2	-	3	2	-	-	-		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

	Co	ontinuous /	Assess	ment Marks (CAM)		
Assessment	Performance clas	e in Practic sses	al	Model		End Semester Examination (ESE)	Total Marks
	Conduction of Practical	Record work	viva	Practical Examination	Attendance	Marks	Marks
Marks	Practical work 15 5 5			15	10	50	100

Department	Mech	anical		Progr	amme :	B.Tech.							
Semester	I			Cours	e Categ	jory: ES	Enc	d Semeste	er Exam ⁻	Type: LE			
Course	11005	SD101		Pe	riods/W	eek	Credit	Max	kimum M	arks			
Code	UZJE	36101		L	Т	Р	С	CAM	ESE	ТМ			
Course Name	ENGI LABC	NEERING DRATORY	MECHANICS	-	-	2	1	50	50	100			
Prerequisite	Basic	Knowledg	je of Science										
	On co	mpletion	of the course, the stu	dents will be	e able to	D			BT N (Highe	lapping est Level)			
	CO1	Applies th	e concept of law of forces	s, principle of n	noments	and equili	brium of for	ces	······	K2			
Course	CO2	Computes	s the axial forces acting in	the truss men	bers and	d centroid	of a lamina.		K3				
Outcome	CO3	Applies th	e coefficient of friction an	d Newton's lav	v of motio	on.			K2				
Outcome	CO4	Infers abo	out the concept of momen	t of inertia of a	flywheel	•				K2			
	CO5 Demonstrates the concept of conservation of energy.												
List of Exp	st of Experiments												
 Verificat Verificat Verificat Verificat Determi Verificat Verificat Verificat Verificat 	ion of eq ion of ax ion of ce nation of ion of ne nation of ion of mo	uilibrium of ial forces ir ntroid of dif coefficient wton's laws moment of ption param	three-dimensional forces the members of a truss ferent lamina of friction between two su of motion inertia of a flywheel neters using conservation	urfaces of energy.									
Lecture Per	iods: -		Tutorial Periods: -	Practi	cal Peri	ods: 30		Tota	I Periods	s: 30			
Reference B	ooks			i				i					
 A.K.Gupt A.K.Shar U.C.Jinda S.Rajase S.S.Bhav 	a, Mohit ma, Engi al, Basics karan, G ikatti and	Bhoot, Eng neering me s of Engine .Sankarasu d K.G. Raja	ineering Mechanics labor echanics practicals, Unive ering Mechanics, Galgotia ubramanian, Fundamental shekarappa, Engineering	atory manual, rsity Science F a Publications, Is of Engineeri Mechanics, N	Scientific Press, 20 2002. ng Mecha ew Age I	: Publishe 09. anics, Vika nternation	rs, 2015. as Publishin al(p) Ltd, Ne	g House P ew Delhi, [*]	vt., Ltd., 2 7th Editior	012. n, 2019.			
Web Referenc 1. http://npte 2. http://www 3. https://np 4. https://ww 5. https://np	es el.iitm.ac w.nptel.ii tel.ac.in/ vw.cours tel.ac.in/	.in/video.ph tm.ac.in/co courses/11 era.org/lea courses/12	np?subjectId=112103108 urses/Webcourse-content 2/106/112106286/ rn/engineering-mechanics 2/104/122104014/	s-statics	: / Engine	eering mea	chanics / Ta	ble of Con	tents.html				

COs		Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
1	3	2	2	1	1	-	-	-	-	-	-	1	2	2	1	
2	3	2	2	1	1	-	-	-	-	-	-	1	2	2	1	
3	3	2	2	1	1	-	-	-	-	-	-	1	2	2	1	
4	3	2	2	1	1	-	-	-	-	-	-	1	2	2	1	
5	3	2	2	1	1	-	-	-	-	-	-	1	2	2	1	

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

	Co	ontinuous /	Assess	ment Marks (CAM)		
Assessment	Performanco clas	e in Practic sses	al	Model		End Semester Examination (ESE)	Total Marks
	Conduction of Practical	Record work	viva	Practical Examination	Attendance	Marks	marko
Marks	15	5	5	15	10	50	100

Department	Mech	anical			Program	nme: B	.Tech.				
Semester	I				Course	Catego	ory: MC	Er	nd Semes	ster Exam T	ype: -
Course Code					Perio	ds / W	eek	Credit	M	laximum Ma	arks
	U23M	EMC01			L	Т	Р	С	CAM	ESE	ТМ
Course Name	INDU	CTION P	ROGRAMM	E	-	-	-	Non-Crec	lit -	-	-
Prerequisite	-				<u>.</u>	-					
Course	The co	ourse will	enable the	student to						BT M (H L	/lapping ighest evel)
Outcome	CO1	Develop	holistic attitud	de and harmon	y in the indi	vidual, f	amily, ar	nd Society			K2
	CO2	Acquire	grammar skill	s and capable	to write and	speak	English (confidently			K2
	CO3	Understa	and the basic	concepts in Ma	athematics a	and Pro	grammin	g			K2
	CO4	Know ab	out the art ar	d culture, lang	uage and lit	erature	of this va	ast secular na	ation		K2
	CO5	Identify t	the inherent ta	alent and devel	lop it profes	sionally					K3
UNIT- I	Unive	rsal Hun	nan Values						Periods	s: 12	
Management, Ar Hostel life, Rela Competition and Sum Up - Role o	ationship Cooperationship	ess Perso s - Hom ation, Pee ion, Need	nality Develop e sickness, (er Pressure, S for a Holistic	oment, Self-imp Gratitude towa ociety - Partici Perspective, S	provement, l ards Parent pation in Sc Self-evaluation	Health - s, Teac ciety, N	Health is thers an latural E Closure	ssues, Health d others Ra nvironment - Sharing and	y diet, He gging and Participati I feedback	althy lifestyle d interaction ion in Nature	, , ,
UNIT- II	Profic	iency in	English						Periods	s: 12	
Communication	skills - I	Prognostic	test on Gra	ammar - Synor	nyms, Antoi	nyms, T	Fenses,	Sentence Co	ompletion,	Idioms and	co
Phrases, One-w	ord Sub	stitution,	Homophones	, Homonyms,	Use of Pre	position	s, Subje	ect-verb			002
Agreement - Wr	iting - Pa	aragraph v	vriting, Letter	writing, Essay	writing, Stor	y Devel	opment.				
UNIT- III	Bridg	e Course	e in Mathem	atics and C	Programn	ning			Periods	5: 12	1
Fundamentals o Continuity of a f Derivatives of ele substitution - Dif functions contain - Definite integr Length of curve -	f differer unction ementary ferentiat ing linea als. Sim • surface	ntial and i - Concept / functions ion of para ir functions iple defini area of a	integral calcu t of differentia s from first prin ametric functi s -Method of in ite integrals - solid.	lus: Theory an ation - Concep nciple - Derivat ons -Differentia ntegration (Dec Properties o	nd Practice, t of derivati ives of inver ation of imp composition f Definite in	Limit c ve - Sle se func icit func methoc ntegrals	f functio ope of a tions - Lo ctions - H I, methoo - Redu	n - Fundame curve -Diffe ogarithmic dif ligher order d of substitutio ction formula	ental resul rentiation ferentiatio derivatives on, integra ae - Area	ts on limits Techniques n - Method o s. Integrals o tion by parts and volume	f f CO:
C Programming Features of C ar statements - Cor	: nd its bas ntrol and	sic Structu Looping s	ire - Keyword statement - Ai	s - constants - rays - Functior	variables - ns - Strings	operato · writing	ors - Data g simple	a types - Forr C programs.	natted inp	ut and outpu	t
UNIT- IV	Litera	ry activi	ties						Periods	: 12	i
Team building ac தமிழர் மரபு ம	ctivities - றற்றும்	Quiz - Or தமிழர் (al Exercises - தொழில்நுட்	Group discuss பம்.	sion, Debate	, Exterr	npore, Ro	ole play, 鈩ற	ப்பு சொ	ற்பொழிவு	- CO4
UNIT- V	Creat	ive arts							Periods	s: 12	
ntroduction to pa Cinematic - Mimic	inting a r ry - Mim	nd renowr e.	ned artworks	- Documentary	and Short	films - N	Music - V	ocal, Instrum	ental - Da	nce - Classica	^{al,} COS
Lecture Period	s: 60		Tutorial Pe	eriods: -	Practic	al Peri	ods: -		Total Pe	riods: 60	
Reference Boo	oks	I			t						
 R.R Gaur, 2nd Revised Kumar Moł Seely, John B.V. Rama B.A. Giner 	R. Astha d Edition nan R, "E n," Oxfor na," Higl	ana, G.P. , 2019. English Gr d A-Z of Q ner Engine	Bagaria," A F ammar for all Grammar and eering Mather	oundation Cou (Functional an Punctuation, C natics", Tata M	irse in Huma Id Applied G Dxford Public IcGraw – Hi	an Valu ramma cation, 2 I, New	es and F r)", Unica 2013. Delhi, 6 th	Professional E are Academy ¹ Edition, 201	Ethics", Ex , 2022. 8.	cel Books, N	ew Dell

- eering itions, Tamil Nadu, 2 Mathemati
- 6.
- 7.
- E. Balagurusamy, "PROGRAMMING IN ANSI C", Mc Graw Hill, 8th Edition, 2019. Dr.K.K.Pillay,"Social Life of Tamils", A joint publication of TNTB & ESC and RMRL R.Balakrishnan, "Journey of Civilization",Roja muthiah research publishers, 1st Edition 2019 8.

9	தமிழக வரலாறு - மக்களும் பண்பாடும், பிள்ளை, கே. கே. , சென்னை : உலகத் தமிழாராய்ச்சி
	நிறுவனம் , 2002.
1	0. கணினித்தமிழ் - முனைவர் இல.சுந்தரம், விகடன் பிரசுரம்.
1	1. கீழடி - வைகை நதிக்கரையில் சங்க கால நகர நாகரிகம், தமிழக தொல்லியல் துறை
We	eb References

- 1. http://www.newsociety.com/Books/S/Slow-isBeautiful
- 2. https://www.aplustopper.com/formal-letter/
- 3. https://www.javatpoint.com/c-programming-language-tutorial
- 4. http://www.math.cum.edu/~wn0g/2ch6a.pdf
- 5. https://education.nsw.gov.au/teaching-and-learning/curriculum/creative-arts

SEMESTER II

Department	Mathe	matics	5		Progra	amme :	B.Tech.					
Semester	II				Cours	e Categ	gory: BS	Enc	l Ser	nestei	r Exam T	ype: TE
Course	1122M	ΔΤ ΓΩ2			Pe	iods/W	eek	Credit		Maxi	mum Ma	arks
Code	UZJIVIA	41602			L	Т	Р	С	CA	۹M	ESE	ТМ
Course Name	ENGIN	IEERIN	NG MATHEM	ATICS – II	3	1	-	4	2	5	75	100
			(Com	mon to <u>ALL</u> B	ranches E	xcept C	SBS, FT)				
Prerequisite	Basic I	Mather	natics									
	On com	pletio	n of the cour	se. the stude	nts will be	e able t	0				BT M	apping
							-				(Highe	st Level)
	CO1	Conve	ert a periodic fur	nction into serie	s form.						ł	{2
Course	CO2	Comp	ute Fourier tran	sforms of variou	us functions	5.					ŀ	<3
Outcome	CO3	Solve	Differential Equ	lations using La	place trans	forms.					ł	{3
	CO4	Apply	inverse Laplace	e transform of s	imple functi	ons.					ŀ	{3
	CO5	Solve	difference equa	ations using Z –	transforms	•					ŀ	{3
UNIT - I	Fourie	r Serie	es							Peri	ods:12	
Dirichlet's cond	itions – G	eneral	Fourier series –	Odd and Even	functions -	Half-Ra	nge sine s	eries and co	osine	series	- Change	e 001
of intervals – Pa	arseval's	Identity	' .									
UNIT - II	Fourie	r Tran	sforms							Peri	ods:12	
Fourier Transfo their properties	rms and i (excludin	ts inver Ig proof	se – Properties).	of Fourier Tran	sform (with	out proo	f) – Fouriei	sine and c	osine	Trans	forms and	^d CO2
UNIT - III	Laplac	e Trar	nsforms							Peri	ods:12	
Laplace transfo	orms of el	ementa	ry functions and	d Periodic funct	ions – Basi	c propei	rties (exclu	ding proof)	– La	place t	ransform	s and
of derivatives a	nd integra	als – Ini	itial and final va	lue theorems.								CO3
UNIT - IV	Invers	e Lapl	ace Transfor	ms						Peri	ods:12	
Definition of inv	erse Lap	lace Tr	ansforms – Col	nvolution theore	em (excludi	ng proof) – Solutio	ns of Linea	r Ord	linary [Differentia	մ CO4
UNIT - V	Z – Tra	ansfor	ms							Peri	ods:12	
Z-transforms – equations using	Elementa g Z - trans	ary Pro sform.	perties – Invers	se Z-transforms	(using par	tial fract	tion and Re	esidues) –	Solut	ion of	difference	^e CO5
Lecture Peric	ods:45		Tutorial Per	iods: 15	Practica	al Perio	ds: -			Tota	I Period	s: 60
Text Books			•									
1. T. Veerara	ajan, "Er	ngineer	ring Mathemat	ics", Tata Mc0	Graw Hill, I	New De	elhi, 3 rd Ec	lition, 201	1.			
2. C. P. Gup	ota, Shre	e Ran	n Singh. M. Ku	umar, "Engine	ering Matl	nematic	s for sem	ester I &	II", T	ata M	cGraw H	lill, New
Delhi, 2 ^{na}	Edition,	2016.		<u> </u>			IL: OODD F	-1:4: 004	~			
3. H.K. Dass	s, Advar	ICEO E	ngineering Ma	inematics, 5	. Chand, N	iew Dei	INI, 22 nd E	altion 201	9.			
1 N P Bali a	nd Dr Ma	anish G	oval "A Textbo	ok of Engineerin	ng Mathema	atics" U	niversity So	cience Pres	s Ind	dia 8 th	Edition 2	2016
2. P. Sivaram	nakrishna	Das a	nd C. Vijayakur	nari, "Engineeri	ng Mathem	atics", F	Pearson Inc	dia Educati	on se	ervices	Pvt. Ltd,	India 1 st
3. Erwin Krey	szig, "Ad	vanced	Engineering Ma	athematics", Jol	hn Wiley &	Sons, N	ew Delhi, 1	0 th Edition,	2019).		
4. G. Balaji, "l	Engineeri	ng Mat	hematics - Tran	sforms and Par	tial Differer	itial Equ	ations", G.	Balaji Publ	isher	s, 18 th	Edition, 2	022.
5. B.V. Rama	na, "High	er Engi	ineering Mather	natics", Tata Mo	cGraw Hill,	New Del	lhi, 2017.					
Web Reference	ces											
Web Reference 1. https://npte	ces el.ac.in/co	urses/1	11105121/									
Web Reference 1. https://npte 2. https://npte	ces el.ac.in/co el.ac.in/co	urses/1 urses/1	11105121/ 11105035/									
Web Reference1. https://npte2. https://npte3. https://npte	ces el.ac.in/co el.ac.in/co el.ac.in/co	urses/1 urses/1 urses/1	11105121/ 11105035/ 1110711									
Web Reference 1. https://npte 2. https://npte 3. https://npte 4. https://swa	ces el.ac.in/co el.ac.in/co el.ac.in/co yam.gov.	urses/1 urses/1 urses/1 in/nd1_	11105121/ 11105035/ 1110711 noc20_ma17/pi	review								

COs		Program Outcomes (POs)													Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
1	3	2	2	-	-	1	-	-	-	-	-	1	1	-	-		
2	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-		
3	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-		
4	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-		
5	3	2	1	1	-	1	-	-	-	-	-	1	3	-	-		

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Conti	inuous Asse	M)	End Semester	Total	
Assessment Marks	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

Department	Comp	Computer Science and Engineering Programme : B.Tech. II Course Cotegory: ES End Semester Exem Type: TE												
Semester				Cours	e Categ	ory: ES	End S	emester	Exam Type	e: TE				
Course	11000	OT 004		Pe	riods/W	eek	Credit	Ma	ximum Maı	[.] ks				
Code	0236	51001		L	Т	Р	С	CAM	ESE	ТМ				
Course Name	PROG	RAMN	IING IN C	3	-	-	3	25	75	100				
			(Common	to <u>ALL</u> B	anches)	-	<u>.</u>						
Prerequisite	Nil													
	On cor	npletio	n of the course, the studer	nts will b	e able t	D			BT Ma (Highes	apping at Level)				
r I I I I I I I I I I I I I I I I I I I	CO1	Compr	ehend the basics of Computers						к	2				
Course	CO2	Illustra	te the concepts of control struct	ures and le	ooping.				к	2				
Outcome	CO3	Impler	nent programs using arrays and	functions.					к	.3				
	CO4	Demor	strate programs using Structure	e and Poin	ters.				к	3				
	CO5	Build th	ne programs using Union and F	ile manage	ement Op	erations.			к	3				
UNIT - I	Introc	luction						Pe	riods: 09					
Generation and	d Classi	fication	of Computers - Block Diagram	of a Comp	outer –Ca	ategories o	of Software	– Networ	k Structure -					
Number Syster		ary – De		- F Seudo	coue – r		•			C01				
UNIT - II	C Pro	gramm	ning Basics					Pe	riods: 09					
Introduction to – Data Types – – Looping state	' C' Proo Expresements.	grammin sions us	ig – Basic structure of a 'C' prog sing operators in 'C' – Managing	ram – com Input and	pilation a Output o	nd linking perations	processes – – Decision N	- Constan Making ar	ts, Variables Id Branching	CO2				
UNIT - III	Array	s and I	Functions					Ре	riods: 09					
Arrays – Initiali	zation –	Declara	ation – One dimensional and Tw	o dimensio	onal array	/s. String-	String opera	ations – S	tring Arrays.					
Simple progran value – Pass b	ns- sorti y refere	ing- sea nce – R	rching – matrix operations- Fundecursion	ction – def	inition of	function –	Declaration	of function	on – Pass by	CO3				
UNIT - IV	Struc	ture an	d Pointers					Pe	riods: 09					
Structure Introc Pointers - Defin Simple program	duction - nition - ns.	– Structi Initializa	ure definition – Structure declara ition – Pointers arithmetic – Poi	ation – Str inters and	ucture wi arrays -F	thin a stru Pointer to	cture – Self Function – F	Referenti Pointer ar	al Structure. d Structure-	CO4				
UNIT - V	Unior	s and	Files					Ре	riods: 09					
Union Introduc Functions - Ra Directives- Dyr	tion - P ndom A namic M	rograms ccess to emory F	Using Structures and Unions - Files - File System Functions - Functions.	- Introduc - Comman	tion to Fi d Line Ar	le - File O guments-	perations - Storage Cla	File Input asses - Pr	and Output	CO5				
Lecture Perio	ds: 45		Tutorial Periods:	Practic	al Perio	ds: -		То	tal Periods	s: 45				
Text Books				I										
1. Balagurusan	ıy. E, "F	rogrami	ming in ANSI C", Tata McGraw	Hill, 8 th Ed	ition, 201	9.								
2. Yashvant Ka	netkar,	"Let us	C", BPB Publications, 16th Editi	on, 2017										
3. Herbert Schi	ldt," C: -	The Con	nplete Reference", McGraw Hill,	, FourthEd	ition, 201	4								
Reference Bo	oks													
1. Vikas B. Aga	rwal Jy	oti P. Mi	rani, "Computer Fundamentals,	Nirali Pral	kashan A	ug-2019,	040							
2. ASNOK N Kar	"A Wor		ner Programming, Pearson eau	nd Edition	2012	pression,2	.012.							
4. P.Visu, R.S	rinivasa	n and	S.Koteeswaran, "Fundamenta	ls of Cor	nputing	and Prog	ramming",	Fourth E	dition, Sri	Krishna				
Publications,	2012.													
5. PradipDev, N	/lanasG	noush, '	Programming in C [*] , Second Ed	lition, Oxfo	rd Univer	sity Press	, 2011.							
	C O	iz com/	c-programming											
2. https://www.j	peeksfo	raeeks o	programming pro/c-language-set-1-introductio	n/										
3. https://www.t	utorials	point.co	m/cprogramming	/										
· · · · · · · · · · · · · · · · · · ·														

4. https://www.assignment2do.wordpress.com/.../solution-programming-in-ansi-c

5. https://nptel.ac.in/courses/106/104/106104128/

COs/POs/PSOs Mapping

COs					Prog	ram O	utcom	es (PO	s)				Prog Outc	ram Spo omes (P	ecific 'SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
2	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
3	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
4	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
5	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Cont	inuous Asse	ssment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

Semester II Course Category: ES End Semester Sample: Type: TE Course Ocame U28ETC01 I T P C CMM ESE TM Course Name BABICS OF CIVIL AND MECHANICAL 3 - 3 25 75 100 Course Name Basic Science C CCM ESE TM Prorequisite Basic Science ET MapPing Preroquisite Basic Science CO1 Understand the types of buildings and materials. K2 CO2 Summarize on the various components of buildings and surveying concepts K2 Course CO3 Identify the various infrastructure facilities K2 K2 CO4 Familiarize the working principles of IC engines and automobile systems K2 K2 CO4 Familiarize the working principles of UC engines and automobile systems K2 CO4 Familiarize the working principles of UC engines and automobile systems K2 CO4 Familiarize the working principles of UC engines and automobile systems K2 CO4 Familiarize the working principles of UC engines and automobile systems K2 <tr< th=""><th>Department</th><th>Civil /</th><th>Mechanic</th><th>al</th><th></th><th>Progra</th><th>nme : B.</th><th>.Tech.</th><th></th><th></th><th></th><th></th><th></th></tr<>	Department	Civil /	Mechanic	al		Progra	nme : B .	.Tech.					
Course Name U23ESTC01 Periods: View Credit Mathem Marks Code L T P. C CAM ESE TM Course Name BASICS OF CIVIL AND MECHANICAL 3 - 3 25 100 Course Name Common to ECE, EEE, ICE, MECH, Civil, Mechatronics Branches) BT Magnetic Magnetic BT BT BT Magnetic BT SC CO Magnetic BT SC CO SC Magnetic BT SC CO	Semester	II				Course	Categor	ry: ES	, E	End Sem	lester E	Exam Type	: TE
Course Name EASICS OF CIVIL AND MECHANICAL 3 - 3 25 75 100 (Common to ECE, EEE, ICE, MECH, Civil, Mechatronics Branches) Prerequisite Basic Science BT Mapping (Highest Level) On completion of the course, the students will be able to BT Mapping (Highest Level) K2 Course CO3 Identity the various infrastructure facilities K2 Outcome CO3 Familiarize the working principles of LC engines and automobile systems K2 Course Name CO3 Identity the various infrastructure facilities K2 CO4 Familiarize the working principles of IC engines and automobile systems K2 CO5 Acquire knowledge about the various machining process. K2 CO6 Acquire knowledge about the various machining process. K2 UNIT - I Buildings And Building Materials Portods: 08 Buildings - Crean building. Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel. Timber - their properties and uses CO1 UNIT - II Buildings Components and Surveying. Periods: 08 Various Buildings Components and Surveying.	Course Code	U23ES	STC01			Peri	ods / We	eek P	Cred C	it C/	Maxi	mum Marl ESE	ks TM
(Common to ECE, EEE, ICE, MECH, Civil, Machatronics Branches) Prerequisite Basic Science BT Mapping (Highest Level) CO Londerstand the types of buildings and materials. K2 CO Gont Muderstand the types of buildings and materials. K2 CO Gont Muderstand the types of buildings and materials. K2 CO Gentry the various infrastructure facilities K2 CO Acquire knowledge about the various machining process. K2 CO Acquire knowledge about the various machining process. K2 CO Acquire knowledge about the various machining process. K2 CO Acquire knowledge about the various machining process. K2 CO Acquire knowledge about the various machining process. K2 CO Acquire knowledge about the various machining. Building Materials - stone, brick, cement, cement mortar, concrete, stell. Deriods: 08 UNIT - I Buildings Components and Surveying Periods: 08 CO Various Buildings Components and Surveying Objects – Classification – Principles – Measurement sci on for dam construction, the tharvesting – Dams - site selection for dam construction, the tharvesting – Dams - site selection for dam construction and types - Grock science f	Course Name	BASIC ENGIN	CS OF CIVI	L AND MECH		3	-	-	3	2	25	75	100
Prerequisite Basic Science On completion of the course, the students will be able to BT Mapping (Highest Leven) Course Outcome Coil Inderstand the types of buildings and materials. K2 Course Outcome Coil Inderstand the types of buildings and materials. K2 Course Outcome Coil Inderstand the various infrastructure facilities K2 Coil Inderstand about the power generation systems and its components K2 Coil Coil Familiarize the working principles of IC engines and automobile systems K2 Coil Coil exclute Knowledge about the various matching process. K2 UNIT -1 Buildings and Buildings Materials Periods: 06 UNIT -1 Buildings Components and Surveying Periods: 08 UNIT -1 Buildings Components and Surveying Periods: 07 Various Buildings Components and their functions. Foundation: function and types - Brick masonry. Stone Masonry and its types - Leveling Coil exclute Karaa UNIT -1 Basic Infrastructure Periods: 07 Roads and Bridges - types, components advantage and disadvantages. Railways - Permanent way and its dements. Sources of dams. Coil exclute Karad dements - Applicatio			(0	Common to E	CE, EEE, ICE, ME	ECH, Civi	l, Mecha	atronics E	Branche	es)			
On completion of the course, the students will be able to BT Mapping (Highest Leve) COURS Outcome CO1 Understand the types of buildings and materials. K2 COURS Outcome CO2 Summarize on the various components of buildings and surveying concepts K2 CO3 Identify the various infrastructure facilities K2 CO4 Familiarize the working principles of IC engines and automobile systems K2 CO5 Understand about the power generation systems and its components K2 CO6 Acquire knowledge about the various machining process. K2 UNIT - 11 Buildings and Buildings Materials Periods: 08 Buildings - Definition - Classification according to NBC-plinh area, Floor area, carpet area, floor space index - Development of Smart cities - Green building. Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel, Timber - their properties and uses CO1 UNIT - 11 Buildings Components and Surveying: Objects - Classification - Principles – Measurements of Distances and areas CO2 UNIT - 11 Buildings Components and their functions. Foundation: function and types - Brick maconry, Stone Masonry and its Upes - Floors. Rods and flogges - Upes, components advantage and disadvantages. Railways - Permanent way and its elements. Sourcos of Water - Quality of Water Domestic sewage Treatment	Prerequisite	Basic S	Science										
Course Outcome Col 200 Understand the types of buildings and materials. K2 Course Outcome Co2 200 Identify the various infrastructure facilities K2 Co0 200 Identify the various infrastructure facilities K2 Co0 200 Identify the various infrastructure facilities K2 Co0 200 Inderstand about the power generation systems and its components K2 Co0 200 Aquire knowledge about the various machining process. K2 DWIT - I Buildings and Buildings Materials Periods: 08 Buildings - Delinition - Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart chies - Green building. Benefits from green building. Building Materials - stone, brick, cernent, ement mortar, concrete, steel, Timber - their properties and uses CO1 VINT - II Buildings Components and Surveying Periods: 08 CO2 Various Buildings Components and variatge and disduantages. Railways - Permanent way not its blements. Sources of vare - Quality of Water- Domestic sewage Treatment - Rain Water harvesting - Dams - site selection for dam construction, types of dams. CO3 VINT - V Internal and External Combustion System Periods: 07 Reads and Bridges - Opes, components advantage and disduantages. Railways - Permanent way not it		On com	npletion of	the course, t	he students will	be able t	D					BT Ma (Highes	pping t Level)
Course K2 Outcome Course Familiarize the working principles of IC engines and automobile systems and its components K2 Course Acquire knowledge about the various machining process. K2 UNIT -1 Buildings and Buildings Materials Periods: 08 Buildings - Definition - Classification according to NBC-plinh area. Floor area. carpet area, floor space index - Development of Smart cities - Green building. Buildings Components and Surveying Periods: 08 VINIT -1 Buildings Components and Surveying Periods: 08 Cor Various Buildings Components and their functions. Foundation: function and types - Brick masonry, Stone Masonry and its types. Surveying: Objects - Classification - Principles - Measurements of Distances and areas of Water - Quality of Water - Domestic sewage Treatment - Rain Water harvesting - Dams - site selection for arm construction. Cor VINIT -1I Buildings Components and their functions. Steman 2000 Stemans - Berinds: 05 Cor Constructional and External Combustion Systems Periods: 07 Periods: 07 Cor Constructions. Application		CO1	Understa	nd the types o	f buildings and ma	aterials.						ĸ	2
Course Outcome CO3 CO4 E Identify the various infrastructure facilities K2 Outcome CO4 E Familiarize the working principles of IC engines and automobile systems K2 CO6 CO6 CO6 E Acquire knowledge about the various machining process. K2 UNT -1 OF CO6 E Buildings and Buildings Materials Periods: 08 Buildings – Definition – Classification according to NBC-plinth area, Floor area, carpet area, floor space index + Development of Smart cities - Green building, Benetits from green building. Building Materials - stone, brick, cement, cement mottar, concrete, steel, Timber - their properies and uses CO1 UNT -1 Buildings Components and Surveying Corpose, Roots and its types. Surveying: Objects – Classification – Principles – Measurements of Distances and areas -Leveling CO2 UNT -1 Basic Infrastructure Periods: 07 CO3 Coddiuly of Water - Coally - Coally - Coally -		CO2	Summari	ze on the varic	ous components o	f building	s and su	rveying co	oncepts			ĸ	2
Cutcome CO4 Familiarize the working principles of IC engines and automobile systems K2 CO5 Understand about the power generation systems and its components K2 CO6 Acquire knowledge about the various machning process. K2 UNIT -1 Buildings and Buildings Materials Periods: 08 Buildings – Definition – Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart cities - Green building, Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel, Timber - their properties and uses CO1 UNIT -1I Buildings Components and Surveying Periods: 08 Various Buildings Components and their functions. Foundation: function and types - Brick masonry, Stone Masonry and its cypes - Floors, Roofs and its types. Surveying: Objects - Classification – Principles – Measurements of Distances and areas -Leveling CO2 UNIT -1II Basic Infrastructure Periods: 07 Roads and Bridges - types, components advantage and disadvantages. Railways - Permanent way and its elements. Sources d'Water - Quality of Water - Domestic sewage Treatment – Rain Water harvesting – Dams - site selection for dam construction, types of dams. CO3 UNIT -V Internal and External Combustion Systems Periods: 08 CO4 C engines - Classification – Constructional features (of only low-pressure b	Course	CO3	Identify th	ne various infra	astructure facilities	3						ĸ	2
COS Understand about the power generation systems and its components K2 COG Acquire knowledge about the various machining process. K2 SECTION A - CIVIL ENGINEERING VINT - I Buildings and Buildings Materials Periods: 08 Buildings - Definition - Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart cities - Green building. Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel, Timber - their properties and uses Periods: 08 UNIT - II Buildings Components and Surveying Periods: 08 Various Buildings Components and Surveying: Objects - Classification – Principles – Measurements of Distances and areas - Leveling Periods: 08 UNIT - III Basic Infrastructure Periods: 07 Roada and Bridges - types, components advantage and disadvantages. Railways - Permanent way and its elements. Sources of dwarer - Quality of Water- Domestic sewage Treatment – Rain Water harvesting – Dams - site selection for dam construction, types of dams. CO3 UNIT - IV Internal and External Combustion Systems Periods: 08 CO4 Cengines - Classification – Working principles – Diesel and Petrol Engines: Two stroke and four stroke engines - merits and demerits Applications. CO4 Steam generators (Boilers) - Classification - Constructional features (of only low-pressure boilers)	Outcome	CO4	Familiariz	the working	principles of IC er	ngines an	d automo	obile syste	ems			ĸ	2
K2 SECTION A - CIVIL ENGINEERING Validings and Buildings Materials Periods: 08 Buildings - Classification according to NBC-pinth area, Floor area, carpet area, floor space index - Development of Smart cities - Green building, Benefits from green building. Building Materials - stone, brick, cement, cement mortar, concrete, steel, Timber - their properties and uses CO1 UNIT -II Buildings Components and Surveying Periods: 08 Various Buildings Components and Surveying Objects - Classification - Principles - Measurements of Distance and areas -Leveling CO2 UNIT -III Build Infrastructure Periods: 08 Various Buildings Components advantage and disadvantages. Railways - Permanent way and its elements. Sources of dwater - Quality of Water - Domestic sewage Treatment - Rain Water harvesting - Dams - site selection for dam construction, types of dams. CO3 VINT - IV Internal and External Combustion Systems Periods: 08 CO4 Congeneter classification - Constructional features (of only low-pressure boilers) - Boiler mounting and accessories - Merits and demerits - Applications. CO4 VINT - V Periods: 07 Various Buildings Materials - Constructional features (of only low-pressure boilers) - Boiler mountings and accessories - Merits and demerits - Applications.		CO5	Understa	nd about the p	ower generation	systems a	nd its co	mponents	5			ĸ	2
SECTION A - CIVIL ENGINEERING UNIT - I Buildings and Buildings Materials Periods: 08 Buildings - Definition - Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart cities - Green building, Benetits from green building. Building Materials - stone, brick, cement, cement motar, concrete, steel, Timber - their properties and uses CO1 UNIT - II Buildings Components and Surveying Various Buildings Components and their functions. Foundation: function and types - Brick masonry, Stone Masonry and Its CPeriods: 08 CO2 UNIT - III Basic Infrastructure Periods: 07 Roads and Bridges - types, components advantage and disadvantages. Railways - Permanent way and its elements. Sources of Water - Quality of Water - Domestic sewage Treatment – Rain Water harvesting – Dams - site selection for dam construction, types of dams. CO3 UNIT - IV Internal and External Combustion Systems Periods: 08 IC engines - Classification – Working principles – Diesel and Petrol Engines: Two stroke and four stroke engines – merits and demerits. Sections - Applications. Steam generators (Boilers) - Classifications. Polications, Geothermal, Wave, Tidal and Ocean Thermal Energy Conversion systems - Functions, Applications - Schemes and layouts (Description onty) Co4 UNIT - V Power Generation Systems: Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system - Layout		CO6	Acquire k	nowledge abo	ut the various ma	chining pr	ocess.					ĸ	2
UNIT - 1 Buildings and Buildings Materials Periods: 08 Buildings - Definition - Classification according to NBC-plinth area, Floor area, carpet area, floor space index - Development of Smart dites - Green building, Benefits from green building. Building Materials - stone, brick, cement mortar of Smart dites - Green building. Benefits from green building. Building Materials - stone, brick, cement mortar of Smart dites - Green building. Buildings from ponents and Surveying - Development Building. Some one brick, cement mortar of Smart dites - Green building. Some one brick, cement mortar of Smart dites - Green building. Some one brick, cement mortar of Smart dites - Green building. Some one brick, cement mortar of Smart dites - Green building. Some one brick and their functions. Foundation: function and types - Brick masonry. Stone Masonry and its types. Surveying: Objects - Classification - Principles - Measurements of Distances and areas - Leveling Periods: 06 UNIT - III Buildings components advantage and disadvantages. Railways - Permanent way and its elements. Sources of Water - Quality of Water - Domestic sewage Treatment - Rain Water harvesting - Dams - site selection for dam construction, types of dams. Periods: 07 CO3 Steam generators (Boilers) - Classification - Constructal end Petrol Engines: Two stroke and four stroke engines - merits and demerits - Applications. Periods: 08 Co4 UNIT - V Nore Generator Systems, Refrigeration and Air Conditioning, Principle of vap-ur compression and adcessories - Schemes and layouts (Description only) Periods: 07 Co4 Refrigeration and Air Conditioning System: Schemes and layouts (Description only) <t< td=""><td></td><td>i</td><td></td><th></th><td>SECTION A - CI</td><td>VIL ENG</td><td>NEERIN</td><td>IG</td><td></td><td></td><td></td><td>.i</td><td></td></t<>		i			SECTION A - CI	VIL ENG	NEERIN	IG				.i	
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UNIT- V Power Generation Systems, Refrigeration and Air Conditioning System Periods: 07 Power plants: Thermal – Nuclear, Hydraulic, Solar, Wind, Geothermal, Wave, Tidal and Ocean Thermal Errgy Conversion systems - Functions, Applications - Schemes and layouts (Description only) Refrigeration and Air Conditioning System: Terminology of Refrigeration and Air Conditioning. Principle of vaour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner. Periods: 07 UNIT- VI Manufacturing Process Periods: of a centre lathe. Casting - Pattern making, Allowances, Green sand and dry sand moulding, casting defects. Weiling - Arc and Gas welding process, brazing and soldering (process description only). Cool Lecture Periods: 45 Tutorial Periods: - Practical Periods: - Total Periods: 45 1. Dr. S. Jayakumar, "Basic Civil Engineering", Aagash Nekaa Publications, 2011 2. G Shanwar, "Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018. 2018. 3. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010. Publications, 2010. Publications, 2010.	accessories -	- Merits a	and demer	its – Applicatio	ons.								
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Lathe - types, Specifications, Operations of a centre lathe. Casting - Pattern making, Allowances, Green sand and dry sand moulding, casting defects. Welving - Arc and Gas welding process, brazing and soldering (process description only). CO6 Lecture Periods: 45 Tutorial Periods: - Practical Periods: - Total Periods: 45 Sectors Image: Civil Engineering, Aagash Nekaa Publications, 2011 Sectors Sectors 2. G Shanmugam, MS Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018. Sectors Sectors 3. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010. Sectors Sectors	UNIT- VI	Manufa	acturing F	Process							Perio	ds: 07	
Lecture Periods: 45 Tutorial Periods: - Practical Periods: - Total Periods: 45 Text Books -	Lathe - types moulding, cas	, Specifie sting def	ications, Op fects. Weld	perations of a ing - Arc and (centre lathe. Cast Gas welding proce	ting - Patt ess, braziı	ern maki ng and s	ing, Allowa oldering (p	ances, (process	Green sa descripti	nd and on only	dry sand /).	CO6
 Text Books Dr. S. Jayakumar, "Basic Civil Engineering", Aagash Nekaa Publications, 2011 G Shanmugam, MS Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010. 	Lecture Perio	ds: 45		Tutorial Peri	iods: -	Practica	l Period	ds: -			Total F	Periods: 4	5
 Dr. S. Jayakumar, "Basic Civil Engineering", Aagash Nekaa Publications, 2011 G Shanmugam, MS Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010. 	Text Books												
 G Shahimugam, MS Palanichamy, Basic Civil and Mechanical Engineering, McGraw Hill Education, 1st Edition, 2018. Palanikumar, K. Basic Mechanical Engineering, ARS Publications, 2010. 	1. Dr. S. Jay	akumar,	, "Basic Civ	vil Engineering	", Aagash Nekaa	Publicatio	ns, 2011				- al:4: -	2042	
	2. G Shanmi	ugam, M	Asic Mach	namy, Basic C	IVII and Mechanica	al Engine	ering, Mo	Graw Hill	Educati	ion, 1st E	aition,	2018.	
Reference Books		iai, r. Di oks		anicai Enginee		auui 15, 20	10.						
1. M.P. Poonia, S.C. Sharma and T.R. Banga, Basic Mechanical Engineering, Khanna Publishing House 2018.	1. M.P. Poor	nia, S.C.	. Sharma a	nd T.R. Banga	a, Basic Mechanic	al Engine	ering, Kh	nanna Pub	olishing l	House 20	018.		

ited, January 2017. ר Edition, Pearson Publication, 2014.
n Edition, Pearson Publication, 2014.
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COs					Prog	gram O	utcome	es (POs)				Prog Outc	jram Spe omes (P	ecific SOs)
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
2	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
3	3	1	1	-	1	-	-	-	-	-	-	1	-	-	-
4	3	1	-	-	-	-	-	-	-	-	-	1	-	-	-
5	3	1	-	-	-	-	-	-	-	-	-	1	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Cont	inuous Asse	ssment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

Department	Mech	anical			Pro	ogra	mme :	B.Tech.					
Semester	11				Co	urse	Categ	jory: PC		End Ser	nester	[.] Exam T	ype: TE
Course	1100M	ET202				Peri	ods/W	eek	Cred	lit	Maxi	mum Ma	rks
Code	UZSIN				L		Т	Р	С	C	٩M	ESE	ТМ
Course Name	ENGI	NEERIN	NG METALLUR	GY	3	}	-	-	3	3 2	5	75	100
					i.	i		.1	.4	<u>.</u>	i		
Prerequisite	Nil												
	On cor	npletio	n of the course	e, the studer	nts wil	l be	able t	0				BT Ma (Highes	apping st Level)
	CO1	Unders	tand the fundame	entals of solidif	fication,	, met	al struc	ture, and	solid sol	ution me	tals.	K	2
Course	CO2	Recogr	nize the phase an	d equilibrium o	diagram	n with	n reactio	ons.				k	2
Outcome	CO3	Apply t	he principles of h	eat-treatment	process	ses.						k	3
	CO4	Unders	tand the polymer	s processing n	nethods	s and	l its end	gineering a	pplicatio	ons.		k	3
	CO5	Perforn	n mechanical test	ing and Analy	se the f	ailur	es.					K	4
UNIT - I	Solid	ificatio	n and Theory o	of Allovs							Perio	ods: 09	
Mechanism of homogenous r Hume-Rothery	f crysta nucleatio Rule, L	llization, on and h ever Rul	Solidification of eterogeneous nu le-Allotropy	metals: pure cleation. Solid	metal	s ar ons:	id alloy Substiti	/s, concep ution solid	ot of su solution	iper coc n-Interstit	ling, N ial solid	lucleation d solution	CO1
UNIT - II	Phase	e Diagr	am and Iron - (Carbon Equi	libriun	n Di	agram	1			Perio	ods: 09	
Construction a Iron Carbon e Manufacturing	nd inter quilibriu method	pretation m diagra s of Cas	of binary phase ams – Classificat t Iron, Alloy cast	diagrams – Ty ion of steel m iron.	rpes – E aking p	Euteo	ctic, Eut sses; p	tectoid, Pe production	of prim	and Perif ary and	ectoid second	systems - dary steel	. CO3
UNIT - III	Heat	Treatm	ent of Steels								Perio	ods: 09	
Introduction to Continuous co and Austempe peening.	o heat t oling cu ring - He	treatmen rves-Imp eat treatr	it- Classifications portant of heat tre ment of stainless	s, Heat treatment of stee steel: austenite	nent of els- Sui e stainle	ferr rface ess s	itic ste Harde iteel an	els: const ning proce d Duplex s	ant tem ess: clas stainless	sification steel-s	e trans ns- Mar hot pee	formation tempering ning-lase	 CO3
UNIT - IV	Polyn	ners an	d Ceramics								Perio	ods: 09	
Introduction – Transfer moldi (Al2O3) - Silico	Prepara ng, Pro on Carbi	tion – ty perties o de (SiC)	pes - PMMA, PE f polymers and <i>F</i> – Silicon Nitride	T, PVC- Proce Applications, E (Si3N4) - Parti	ssing o ngineei ally Sta	of pol ring abiliz	ymers, Cerami ed Zirco	Extrusion cs –Prope onia (PSZ)	Injectio rties an and Sia	n moldir d applica alon.	ng, Blov ations c	w molding of Alumina	CO4
UNIT - V	Defor	mation	and Materials	Testing							Perio	ods: 09	
Mechanical pro macro), Impac and fatigue.	operties t, Fatigu	of mate ue and C	rials - Deformatio Creep testing. Me	on – types - Te chanism creep	esting o behav	of ma vior,	aterials, fatigue	, Tensile, (behavior-	Compres S-N Cu	ssion, Ha Irve-desi	ardness gn aga	s (micro 8 iinst creep	, CO5
Lecture Peric	ods:45		Tutorial Peric	ods:	Pract	tical	Perio	ds: -			Tota	I Period	s: 45
Text Books													
1. S. K.Manda	l, Steel	Metallur	gy: Properties, Sp	pecifications ar	nd Appl	licatio	ons, Mo	:Graw-Hill	Educati	on, 2014	•		
2. Srinivasan,	Engine	ering Ma	terials and Metall	urgy, Tata Mc	Graw-H	lill Ec	ducation	n,2nd editi	on,2015				
3. A. Lavakum	nar, Con	cept of i	n physical metallu	urgy, Morgan 8	k clay p	ublic	ation,2	017					
Reference Boo	ks												
1. Sidney H. A	wner, In	troductio	on to Physical Me	tallurgy, Tata I	McGrav	v-Hill	Publis	hing comp	any Ltd	2nd Ed	tion 20	08.	
2. Romesh C.	Sharma	a, Princip	les of heat treatn	nent of steels,	New Ag	ge In	ternatio	onal, 2010.			~		
3. L. Krishna r	eddy, P	rinciples	ot Engineering N	ietallurgy, New	v Age P	ublis	shing C	ompany Li	d, 10th	Edition 2	:011.		
4. Nannadi Pa	lianKeez	Dhysics	I, IVIETAIIUrgical Fa	anure Analysis		ier, 2	UI8. n 2010						
Web Reference	s	i iiysica	i wetanurgy, Tayl		5, ISL⊏	-0110	11 2010						
1. https://npte	.ac.in/co	ourses/1	13106088/										
2. https://npte	l.ac.in/co	ourses/1	13104074/										

- 3. https://fractory.com/heat-treatment-methods/
- 4. http://www.phase-trans.msm.cam.ac.uk/2005/growth.html
- 5. https://www.vssut.ac.in/lecture_notes/lecture1450443095.pdf

COs					Pro	gram O	utcome	es (POs	i)				Prog Outo	gram Spe omes (P	ecific SOs)
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	2	-	1	1	-	1	-	1	-	1	1	1	1
2	3	1	2	-	-	-	-	1	-	1	-	1	2	1	1
3	3	1	1	-	-	1	-	-	-	1	-	2	1	1	1
4	3	1	1	1	-	1	1	1	-	1	1	2	1	1	2
5	3	2	1	1	2	1	-	1	2	2	1	2	1	1	2

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Cont	inuous Asse	essment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

Department	Mech	anical			Progra	amme :	B.Tech.					
Semester	11				Course	e Categ	ory: HS	End	Semester	Exam Ty	pe: TE	
Course	1123H	STC01			Per	iods/W	eek	Credit	Maxi	num Mar	ks	
Code	02011	01001			L	Т	Р	С	CAM	ESE	ТМ	
Course Name	UNIV	ERSAL	HUMAN VALUES -	II	2	-	-	2	25	75	100	
		-	(Commo	n to all B	ranch)						
Prerequisite	UHV -	-									-	
	On coi	mpletio	on of the course, the	studen	ts will be	e able t	0			(Highes	pping : Level)	
	CO1	Evalua life and	te the significance of va profession	lue inputs	s in formal	educatio	on and sta	rt applying th	nem in their	K	2	
Course	CO2	Disting Self ar	uish between values an d the Body, Intention ar	d skills, h nd Compe	appiness etence of	and accu an indivi	umulation o dual, etc.	of physical fa	acilities, the	K	2	
Outcome	CO3	Analyz profes:	e the value of harmonio sion	ous relati	onship ba	sed on	trust and r	espect in th	eir life and	КЗ	2	
	CO4	Exami	ne the role of a human b	peing in e	nsuring ha	armony i	in society a	and nature.		K	2	
	CO5	Apply profess	the understanding of e	thical cor	nduct to f	ormulate	e the strate	egy for ethic	cal life and	ĸ	2	
UNIT - I	Intro	duction	to Value Education						Perio	ods: 06		
Right Understa Value Educatio - Current Scen	anding, on - Self ario- Me	Relation -explora ethod to	ship and Physical Facil tion as the Process for N Fulfil the Basic Human	lity (Holist √alue Edu Aspiratior	tic Develo ucation - E ns	pment a asic Hu	and the Ro man Aspira	le of Educa ations - Hap	tion) - Unde piness and	erstanding Prosperity	C01	
UNIT - II	Harm	ony in	the Human Being						Perio	ods: 06		
Understanding the Body-The Programme to	Humar Body a ensure	n being a s an Ins self-reg	is the Co-existence of th trument of the Self-Une ulation and Health	ne Self an derstandi	nd the Boo ng Harmo	ly-Distin ony in th	guishing b e Self-Har	etween the l mony of the	Needs of th e Self with	e Self and the Body-	CO2	
UNIT - III	Harm	ony in	the Family and Soci	iety					Perio	ods: 06		
Harmony in the Evaluation - Ot Universal Hum	e Family ther Fee an Orde	r - Basic elings, Ju er.	Unit of Human Interactic ustice in Human-to-Hum	on- 'trust' nan Relati	- Foundat onship - L	ional Va Jndersta	lue in Rela Inding Hari	tionship - 'F mony in the	Respect' - as Society-Vis	the Right ion for the	CO3	
UNIT - IV	Harm	ony in	the Nature / Existen	ce					Perio	ods: 06		
Understanding Nature - Realiz	Harmo zing Exis	ny in the stence a	e Nature-Interconnected s Co-existence at All Le	dness, sel evels - Ho	lf-regulatio	on and N eption o	/lutual Fulf f Harmony	ilment amor in Existenc	ng the Four e	Orders of	CO4	
UNIT - V	Impli	cations	of the Holistic Unde	erstandi	ing - A L	ook at	Professio	onal Ethic	s Perio	ods: 06	1	
Natural Accep Humanistic Co Systems and M	tance c institutic /anagei	of Huma on and L ment Mo	n Values - Definitiven Iniversal Human Order- dels-Typical Case Stud	ess of (E -Compete lies-Strate	Ethical) H ence in Pr egies for T	uman C ofession ransitior	onduct - I nal Ethics-F n towards \	Basis for H Holistic Tech /alue - base	umanistic I nnologies, F ed Life and F	Education, Production Profession	CO5	
Lecture Perio	ods: 30		Tutorial Periods:		Practica	l Perio	ds: -		Tota	l Periods	: 30	
Text Books	Fext Books											
1. R. R. Gaur Edition Ne	, R. Astl w Delh	hana, G. i 2019	P. Bagaria, "A Foundati	ion Cours	e in Huma	n Value	s and Profe	essional Ethi	cs", Excel E	Books, 2nd	Revised	
Reference Bool	ks	., 2013.										
1. A Nagraj,	Jeevan	Vidya P	rakashan, Amarkantak, Jes" New Ago Intornati	"Jeevan V	Vidya: Ekl	Parichay	a", 2013.	2010				
 A.N. mpa Annie Leor 	un, ⊓ur nard, "T	he Stor	of Stuff", Free Press. F	Reprint Ec	dition, 201	1.	, 3 [™] ⊑uiu0i	1, 2019.				
4. Mohandas	Karam	chand (Gandhi, "The Story of M	y Experin	nents with	Truth –	Mahatma	Gandhi Auto	obiography"	, Finger pr	int	
Publisher, 5. F. F. Schur	2009. nacher	"Small i	s Beautiful". Vintage Pu	ıblisher 1	993.							
6. Cecile And	lrews, "	Slow is I	Beautiful", New Society	Publisher	s, 2006.							
 J C Kumar 8. Pandit Sur 	appa, " nderlal.	Econom "Bharat	y of Permanence", Sarv Mein Angreii Rai". Prabl	va Seva S hat Praka	angh Pral shan Pub	kashan, lisher. 2	2017. 021.					

9. Dharampal, "Rediscovering India", Stosius Inc/Advent Books Division Publisher, 1983. 10. Mohandas K. Gandhi, "Hind Swaraj or Indian Home Rule", Gyan Publishing House, 2023. 11. Maulana Abdul Kalam Azad, "India Wins Freedom", Orient BlackSwan Publisher, 1st Edition, 1988. 12. Life of Vivekananda, "Romain Rolland (English)", Advaita Ashrama Publisher, India, 4th Edition, 2010. 13. Mahatma Gandhi, "Romain Rolland (English)", Srishti Publishers & Distributors, 2020. Web References https://www.uhv.org.in/uhv-ii 1. 2. http://www.storyofstuff.com https://www.youtube.com/channel/UCQxWr5QB_eZUnwxSwxXEkQw 3. https://fdp-si.aicte-india.org/8dayUHV_download.php 4. 5. https://www.youtube.com/watch?v=8ovkLRYXIjE

COs/POs/PSOs Mapping

COs					Pro	gram O	utcome	es (POs)				Prog Outc	jram Spe omes (P	ecific SOs)
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
2	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
3	-	-	-	-	-	3	3	2	2	-	-	3	-	-	-
4	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-
5	-	-	-	-	-	2	3	2	2	-	-	3	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Cont	inuous Asse	ssment Marks (CA	M)	End Semester	Total
Assessment	CAT 1	CAT 2	Model Exam	Assignment*	Attendance	Examination (ESE) Marks	Marks
Marks	5	5	5	5	5	75	100

Department	Englis	sh			Progra	amme :	B.Tech.				
Semester	II				Cours	e Categ	jory: HS	End	Semester	r Exam Tי	ype: TE
Course	11235				Pe	riods/W	eek	Credit	Maxi	mum Mai	rks
Code	UZJE				L	Т	Р	С	CAM	ESE	ТМ
Course Name	Сомі	MUNICA	TIVE ENGLI	SH - II	2	-	2	3	50	50	100
	T		(C	common to ALL E	Branches	except	CSBS)				
Prerequisite	Basics	s of Eng	lish Languag	9						•	
	On co	mpletio	n of the cou	rse, the student	s will be	able to	•			BT Ma (Highes	apping t Level)
	CO1	Draft ef	fective written	communication in p	professio	nal enviro	onment			K	2
0	CO2	Apply th	ne mechanics o	of creative writing v	with precis	sion and	clarity			K	3
Outcome	CO3	Acquire various	e language skil etiquettes in re	ls professionally to eal time situation	o groom t	he overa	all persona	llity through	sensitizing	к	2
	CO4	Develo	o language flue	ency and gain self-	confidenc	e				ĸ	3
	CO5	Expres	s thoughts and	ideas with clarity a	and focus					K	2
UNIT- I	Busin	ness Co	rrespondenc	;e					Peri	ods: 10	
Business Writi Official Letters Letter to the E Application Le	ng: Circi : Applyi Editor, C tter, Bio-	ular, Age ing for Eo alling for -data, C\	nda, Memoran ducational / Ca · a quotation, F /	da, Notice, Instruct r / Home Loans / J Placing Order, Lett	tion, Minu loining Re er of Cor	tes, Ema port, Lea nplaints,	ail Writing ave Letter, Letter see	Report Writ Industrial V eking Clarifi	ing- Official /isit, In plan cation, Res	and Demi t Training, ume', Job	CO1
UNIT- II	Funct	tional W	riting Skills						Peri	ods: 10	
Four Modes of in sentence, P	f Writing, rinciples	, Sentences of parag	ce Structure, Ai graph writing, T	t of condensation: echniques of Essa	Summary ay Writing	Writing , Jumble	and Note I d Sentenc	Making, Use e, Paraphra	of phrase a sing	and clause	CO2
UNIT- III	Etique	ettes							Peri	ods: 10	<u>i</u>
Etiquette: Mea Etiquette, Dini	aning, K ng Etiqu	Kinds: Co lette, Cor	orporate Etiquinmunication Et	ette, Meeting Etiq iquette	juette, Te	lephone	Etiquette	, Email Eti	quette, Soo	ial Media	CO3
UNIT- IV	Comn	nunicat	ion Practice	- 11					Peri	ods: 15	
List of Exerci Listening: Le Speaking: Ju Reading: Va Writing: Diffe	ses etter writ ust a Min riety of e erent typ	ing tips nute, Imp examples es of lett	romptu Speech for Modes of V ers	n, Contemporary Is Vriting	sues						CO4
UNIT- V	Interp	persona	I Communic	ation - II					Peri	ods: 15	
List of Exerci Listening: V Speaking: T Reading: Ph Writing: Fre	ses lideos or leam Pre lirase and e writing	n differen esentation d Clause) on any (t types of Etiqu n, Negotiation S given topic, Pa	iettes Skills raphrasing Practice	e						CO5
Lecture Per	iods: 3	0	Tutorial P	eriods: -	Practio	al Peri	ods: 30		Total	Periods:	60
Text Books					•				i		
1. PC Das, "L	etter Wr	iting inclu	uding Official a	nd Business Letter	s", New C	Central B	ook Ageno	cy, 2020.			
2. Kumar, Sa	njay, Pu	shpalath	a," Communica	tion Skills". Oxford	I Universi	ty Press,	2018.				
3. Raman, Me	eenaksh	i&Sange	etha Sharma,"	Communication Sk	kills", Nev	/ Delhi: C	DUP, 2018				
Reference B	ooks										
 Sahukar, N Gerson Sh Grussendo 	limeran, aron J, S orf, Mario	Bhalla, F Steven M on, "Engli	Prem,, "The bo . Gerson, "Tec sh for Presenta	ok of Etiquettes ar hnical Writing Proc ations". Oxford Univ	nd Manne cess and versity Pr	rs".Pusta Product" ess, Oxfo	akMahal F , Pearson ord, 2007.	Publisher, N Education F	ew Delhi; 1: vt. Ltd. 3rd	st Edition Edition, 20	2009. 009.
4. Seely John	i, "The C	Dxford Gu	ide to Writing a	and Speaking", Ox	ford Univ	ersity Pre	ess, 2006.				
5. R.C. Sharn	na, Krish	nna Moha	an, "Business C	Correspondence an	nd Report	Writing"	, Tata McC	Graw Hill &C	o.Ltd., New	Delhi, 200	J1

Web	References
1.	https://www.indeed.com/career-advice/finding-a-job/how-to-write-an-application-letter
2.	https://owlcation.com/humanities/Four-Types-of-Writing
3.	https://targetstudy.com/languages/english/paragraph-writing.html
4.	https://www.businessnewsdaily.com/8262-email-etiquette-tips.html
5.	https://www.youtube.com/watch?v=UOceysteljo

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
2	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
3	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
4	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-
5	1	-	-	-	-	-	-	-	-	3	-	1	-	-	-

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Theory											
	Conti	nuous Ass	sessment Marks	(CAM)	End Semester						
Assessment	CAT 1	CAT 2	Model Exam	Attendance	Examination (ESE) Marks	Total Marks					
Morko	5	5	5	5	75	60					
IVIAINS	20) (to be we	ighted for 10 mar	ks)	(to be weighted for 50 marks)	00					

		Practical		
Continuous Assessment I	nternal Evaluation	End Seme	ster Internal Evaluation	Total Marks
30 (to be weighte	d for 10 marks)		30 marks	
Listening (L)*	10	Listening (L)*	10	
Speaking(S)	5	Speaking(S)	5	40
Reading(R)*	10	Reading(R)*	10	
Writing(W)*	5	Writing(W)*	5	

LRW components of Practical can be evaluated through Language Lab Software

Department	Mechanical Programme : B.Tech.													
Semester	11			Cours	e Categ	ory: ES	End	Semeste	er Exam T	ype: LE				
Course	11005			Pe	riods/We	eek	Credit	Max	imum Ma	ırks				
Code	U23E	SPC03		L	Т	Р	С	CAM	ESE	ТМ				
Course Name	El	NGINEE	RING GRAPHICS USING AUTOCAD	-	-	2	1	50	50	100				
			(Common t	o all Bra	anches)									
Prerequisite	Nil													
	On co	mpletio	n of the course, the students	s will be	able to)			BT M (Highe	apping st Level)				
	CO1	Familia	rize with the fundamentals and sta	andards o	of engine	ering grap	hics.		ł	<3				
Course	CO2	Perform	n drawing of basic geometrical cor	struction	is and m	ultiple view	vs of objects		ł	{2				
Outcome	CO3	Visualiz	e the isometric and perspective se	ections o	f simple :	solids.			ł	<3				
	CO4	Connec	t side view associate on front viev	v.					ł	{ 4				
	CO5	O5 Correlate sectional views and lateral surface developments of various solids. K4												
List of Expe	riment	nents												
 Drawing Drawing Drawing Drawing Drawing Drawing Drawing Creating Note: P 	g front vi g a plan g section g lateral g isometi g 3D mo lotting of	iew, top v of reside nal views surface o ric projec odel of sin f drawing	view and side view of objects from ntial building (Two bed rooms, kito of prism, pyramid, cylinder, cone, development of prism, pyramid, cy stion of simple objects. nple object and obtaining 2D multi s must be made for each exercise	the given chen, hall etc, linder, co i-view dra e and atta	n pictoria I, etc.) one, etc, awings. ached to	l views (eq	g. Simple sto s written by	ool, V-bloc Students.	k, Mixie B	3Se).				
Lecture Per	iods: -		Tutorial Periods: -	Practic	al Perio	ods: 30		Tota	Periods	: 30				
Reference E	Books													
1. James D.	Bethune	e, Engine	ering Graphics with AutoCAD A S	pectrum	book 1st	Edition, N	lacromedia	Press, Pe	arson, 202	20.				
2. NS Partha	asarathy	and Vela	a Murali, Engineering Drawing, Ox	ford univ	ersity pre	ess, 2015.	<u></u>							
3. M.B Shah	, Engine	ering Gra	Applics, IIL Education Solutions Li	mited, Po	earson E	ducation F	Publication, 2	2011.	17					
4. Dhail N.D 5. Jevanoov	anu Par an T En		n, Engineering Drawing. Plane and		ikas Publ	, Charolar lishing Hol	Publishing r	7th Edition	I7. New Del	lhi 2016				
6. C M Agrav	wal. Bas	ant Agra	wal. Engineering Graphics. McGra	aw Hill. 2	012.	lioning riot			1, 1101 20	111, 2010.				
7. Dhananja	7. Dhananjay A. Jolhe, Engineering Drawing: With An Introduction To CAD McGraw Hill, 2016.													
8. James Le	ach, Aut	toCAD 20	017 Instructor, SDC Publications, 2	2016.										
WebReferen1.http://vla2.http://ww3.https://m4.https://au5.https://du	nces bs.iitb.ac w.nptelv ech.iitm. utocadtu wgmodel	c.in/vlabs videos.in/ .ac.in/me torials.co ls.com	-dev/labs/mit_bootcamp/egraphic 2012/12/computer-aided-design.h iitm/course/cad-in-manufacturing/ m	s_lab/lab html	s/index.p	ohp								

COs		Program Outcomes (POs)											Program Specific Outcomes (PSOs)		
	P01	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
2	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
3	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3
4	3	1	-	-	3	-	-	-	3	-	-	2	3	3	3
5	3	1	-	-	3	-	-	-	3	-	-	3	3	3	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

Assessment	C	continuous	Assessi	ment Marks (CAM	1)		
	Performan cla	ce in practio asses	cal	Model	Attendence	End Semester Examination	Total Marks
	Conduction of practical	Record work	viva	Examination	Attendance	(ESE) Marks	inarite
Marks	15	5	5	15	10	50	100

Department	Mech	anical Engineering	Progra	amme: E	3.Tech.				
Semester	II		Cours	e Categ	ory: ES	End Se	mester E	xam Typ	e: LE
Course			Pe	riods/We	eek	Credit	Maxi	mum Ma	arks
Code	U23C	SPC01	L	Т	Р	С	CAM	ESE	ТМ
Course Name	PROG	RAMMING IN C LABORATORY	-	-	2	1	50	50	100
	•	(Common te	o All Bra	anches)					
Prerequisite	Nil								
	On co	mpletion of the course, the students	s will be	able to)			BT M (Highe	lapping est Level)
	C01	Implement logical formulations to solve sir	mple pro	blems le	ading to sp	pecific applic	ations.		K3
Course	CO2	Execute C programs for simple applicati strings.	ions mal	king use	of basic	constructs, a	arrays and		K3
Outcome	CO3	Experiment C programs involving function	ns, recurs	sion, poir	nters, and	structures.			K3
	CO4	Demonstrate applications using sequentia	al and rai	ndom ac	cess file pr	ocessing.			K3
	CO5	Build solutions for online coding challenge	es.						K3
List of Expe	eriment	S							
 2. Devel For ar 3. Write 4. Write 5. Demo 6. Find ti 7. Write 8. Write 9. Devel 10. Const 11. Implet 12. Write 13. Devel 14. Write 15. Write 16. Const 17. Write 18. Write 19. Write 20. Write 	1 hun 7 tens 2 unit a C prog a C prog a C prog nstrate d he factor a C prog a C prog a C prog op a C prog a C prog	dreds s s 172. ram to check whether a given character is w ram to Print the numbers from 1 to 10 along lo—While loop in C to find the sum of 'n' nu ial of a given number using Functions in C. ram to check whether a given string is palir ram to check whether a value is prime or ne rogram to swap two numbers using call by w program to find the smallest and largest ele trix multiplication using C program. ram to perform various string handling func rogram to remove all characters in a string ram to find the Sum of an integer array usin ram to find the Maximum element in an integ program to display Employee details using ram to display the contents of a file on the ne getting the input from the keyboard and ref ram to pass the parameter using command	vowel or g with the imbers. hdrome c ot? value an ement in except a ng pointe eger arra Structure monitor s trieve the Merge t I line arg	not using eir squar or not? d call by an array e strlen, s lphabets rs. y using p es screen. e content he two fil uments.	g Switch – es. reference. strcpy, strc oointers. s of the file e contents	Case stater at, strcmp.	peration congle file	ommands	5.
Lecture Per	IODS: -	I utorial Periods: -	Practic	al Perio	bas: 30		Iotal	reriods	5: 30
1. Zed A Sh	aw." Lea	arn C the Hard Way: Practical Exercises or	n the Co	mputatio	nal Subie	cts You Kee	p Avoiding	(Like C)	". Addison
Wesley,2 2. Anita Goe	016. el and Aja	ay Mittal," Computer Fundamentals and pro	ogrammi	ng in C",	Pearson E	Education, F	irst edition	, 2011.	,
3. Maureen	Sprankle	e, Jim Hubbard," Problem Solving and Prog	ramming	g Concep	ots," Pears	on,9 th Editio	n, 2011.		
4. Yashwan	th Kanet	hkar, "Let us C", BPB Publications,13 th Edit	tion,2008	3.					
5. B.W.Kerr	ighan ar	d D.M. Ritchie, "The C Programming Lang	uage", P	earson E	ducation,	2 nd Edition,	2006.		
1. https://alie	nces	ourse/introduction-to-c-programming							
2. https://www	w.geeksf	orgeeks.org/c-programming-language/							
3. http://cad-l	ab.githul	p.io/cadlab_data/files/1993_prog_in_c.pdf							
4. https://www	w.tenouk	.com/clabworksheet/clabworksheet.html							
5. https://fres	h2refres	h.com/c-programming/							

COs	Program Outcomes (POs)												Program Specific Outcomes (PSOs)		
	PO1	PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO										PO12	PSO1	PSO2	PSO3
1	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
2	2	1	-	-	3	-	-	-	-	-	-	-	3	-	3
3	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
4	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3
5	3	2	1	1	3	-	-	-	-	-	-	-	3	-	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

		Continuous	Assessme	ent Marks (CAM)		End	
Assessment	Performance i	n practical	classes	Model		Semester	Total
	Conduction of practical	Record work	viva	Practical Examination	Attendance	(ESE) Marks	Marks
Marks	15	5	5	15	10	50	100

Department	Mech	anical		Prog	amme :	B.Tech.				
Semester	II			Cours	se Categ	gor: PC	Enc	Semeste	er Exam 1	Гуре: LE
Course				Pe	eriods/W	eek	Credit	Max	kimum Ma	arks
Code	U23N	IEP201		L	Т	Р	С	CAM	ESE	ТМ
Course Name	MAN		RING AND METALLURG` (Y _	-	2	1	50	50	100
Prerequisite	Nil									
	On co	mpletion	of the course, the stude	ents will b	e able t	0			BT M (Highe	lapping st Level)
	CO1	Be conve	ersant with the basic manufac	cturing proc	esses.					K3
Course	CO2	Identify a	nd apply suitable tools and in	nstruments	for mach	ining, asse	embly and fit	tting		K3
Outcome	CO3	Use diffe	rent moulding tools, patterns	and prepar	e sand m	noulds				K3
0 dtoomie	CO4	Select si	itable welding for the given r	material and	perform	various o	perations			K3
	CO5	Evaluate	the effect of heat treatment	on propertie	s of steel	l and mea	sure the har	dness		K3
List of Exper	iments								<u>i</u>	_
4. Taper 5. Threa 6. Drillin, Foundry 7. Prepa Welding 8. Prepa Metallurgy I 9. Study 10. Prepa 11. Prepa 12. Jomin	turning d cutting g and bc ration of .aborato of metal ration ar ration ar y End Q	g a sand mo butt joints bry Ilurgical mi nd study of nd study of uenching T	old using solid pattern and lap joints by using manu croscope and sample prepar the microstructure of copper microstructure of aluminum Fest	ual metal ard ration. r and its allo and its alloy	c welding ys 's	I				
Lecture Perio	ods: -		Tutorial Periods: -	Practic	al Perio	ds: 30		Total	Periods:	30
Reference Be	ooks			i.				i		
 Hajra Ch Promoter Hajra Ch Pvt Ltd, N R.C. Sha Vijendra S K. Rajput 	oudhury s & Publ oudhury Jumbai, rma, Prir Singh, ho , Manufa	S.K., Hajı lishers Priv S.K., Nirjh 2010. nciples of H eat treatme acturing Pro	a Choudhury A.K., Nirjhar F ate Limited, Mumbai, 2008. ar Roy, "Elements of Worksh leat Treatment of Steel.1 Ed ent of metals. Standard Public pocesses, Lakshmi Publication	Roy, "Eleme hop Technol lition, New A shers,2020. ns,2020.	ents of W logy-Volu .ge Interr	/orkshop ume-2", 15 national Pu	Technology ith Edition, N ublishers,201	- Vol. I", <i>′</i> /ledia Pron 18.	14th Editic	n, Media Publishers
1. http://www	w.nptelvi	ideos.in/20	12/12/manufacturing-process	ses-ii.html						
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4. https://wv	w.rubig	.com/en/he	at-treatment/rubig-heat-treat	tment/						
5. https://np	tel.ac.in/	courses/1	12/107/112107219/							

COs	Program Outcomes (POs)										Program Specific Outcomes (PSOs)				
	PO1	PO2	PO3	PO4	PO5	PO6	P07	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	3	2	-	1	-	-	-	-	2	1	-	-	2	2	3
2	2	1	-	1	-	-	-	-	1	1	-	-	2	1	2
3	2	1	-	1	-	-	-	-	1	1	-	-	2	2	1
4	2	1	-	1	-	-	-	-	1	1	-	-	1	2	2
5	2	1	-	1	-	-	-	-	1	1	-	-	2	2	3

Correlation Level: 1 - Low, 2 - Medium, 3 - High

Evaluation Methods

	C	continuous						
Assessment	Performan cla	ce in practio asses	cal	Model	Attendence	End Semester Examination	Total Marks	
	Conduction of practical	Record work	viva	Examination	Attendance	(ESE) Marks		
Marks	15	5	5	15	10	50	100	

Department	Mechanical				Programme : B.Tech.							
Semester	Ш				Course Category: MC End S				Seme	Semester Exam Type: -		
Course	1123M	23MEM202			Per	iods/We	Credit Maxir			num Marks		
Code	de		_		L T P		С	C CAM		ESE	ТМ	
Course Name	SPOR	TS, YOG	GA AND NSS		2 <u>Non-</u> Credit 100 -						-	100
			(Co	ommon t	o all B	ranch)						
Prerequisite	-											
On completion of the course, the students will be able (H									BT Ma (Highes	apping t Level)		
	CO1	Practic relaxat	e Physical activities and I ion.	Hatha Yo	iga foci	ising on	yoga for	strength, fle	xibility	and	K2	
Course Outcome	CO2	Unders flexibili	erstand basic skills associated with yoga and physical activities including strength and bility, balance and coordination.								K2	
Outcome	CO3	Develo	op understanding of psychological problems associated with age and lifestyle.								K2	
	CO4	Recognize the importance of national service in community development.									K2	
	CO5	Conve	ert existing skills into social	existing skills into socially relevant life skills.								2
UNIT - I	Introd	luction	to Physical Education						F	Perio	ds: 06	
Definition, Aim Physical Fitne Components of Concept of Pos	Definition, Aims and Objectives of Physical Education - Changing trends in Physical Education Physical Fitness, Wellness and Lifestyle: Importance of Physical Fitness and Wellness - Components of Physical fitness - Components of Health related fitness - Components of wellness - Preventing Health Threats through Lifestyle Change - Concept of Positive Lifestyle. CO1											
UNIT - II	Yoga	and Lif	festyle						F	Perio	ds: 06	
Importance of concentration a improving cond Asthema.	Importance of Yoga - Elements of Yoga - Introduction - Asanas, Pranayama, Meditation and Yogic Kriyas - Yoga for concentration and related Asanas (Sukhasana, Tadasana, Padmasana and Shashankasana) - Relaxation Techniques for improving concentration - Yog-nidra. Asanas as preventive measures – Hypertension – Obesity - Back Pain-Diabetes - Asthema.											
UNIT - III	Traini	ing and	I Planning in Sports						F	Perio	ds: 06	1
Training - War League/Round	ming up Robin a	and lim	bering down-Skill, Techni bination.	ique and	Style -	Objectiv	es of Plan	ning – Tour	namen	t - K	nock-Out,	
Psychology and Sports - Important of Psychology in Physical Education and Sports - Differentiate Between Growth and Development - Adolescent problems and their Management - Emotion: Concept, Type and Controlling of emotions - Concepts and Types of Aggressions in Sports - Psychological benefits of exercise - Anxiety and Fear and its effects on Sports Performance - Motivation, its type and techniques - Understanding Stress and Coping strategies												
UNIT - IV	Introc	luction	To National Service S	Scheme					F	Perio	ds: 06	
Orientation of NSS volunteers: History, motto, symbol, awards, structure and activities of NSS - Days of National and International Importance - Sensitizing about the thrust areas and awareness activities - Importance of tree plantation and voluntary blood donation - The role of SHGs and NGOs in community development – CSR - Life skills and youth development- extension activities in HEIs - various clubs and schemes like RRC, ELC, YRC, UBA, SBA, etc.,												
UNIT - V Community Issues and the use of Technology Periods: 06												
Common Prob products - Ser village survey -	lems of vice lea · Initiativ	rural Inc rning an es to cle	lia - Technology developm nd youth volunteering – Sl ean and green environmer	nent and i hramdaar nt - presei	its suita n - Can rvation	bility – S npus cle of water	Sustainabil aning - Fi bodies in	ity - Value a eld visit to r adopted villa	ddition learby liges.	to aq comr	gricultural nunities -	CO5
Lecture Perio	Lecture Periods: - Tutorial Periods: - Practical Periods: 30 Total							Periods: 30				
Reference Books												
 Brar Ajmer Publishers B.K.S. Iyer Joseph, Si Barman Pr Prof R.B.S 	[·] Singh, , 6 th Edi ngar, "Li by K, M rateeti, (. Verma	Gill Jagi tion, 201 ght on Y ahodaya Goswam I, "Field Y	tar Singh, Bains Jagdish, " 14 ′oga: The Definitive Guide a, "Bharat Essays on Confl ii, "Document on Peace Ec Work Practicum in Social V	'Modern 7 to Yoga lict Resoluducation", Work-Em	Fextboo Practico ution", I , Triven erging	k of Phy e", Thors nstitute o Akansh Concern	sical Educ sons Publis of Gandhia a Publishi s", Rapid I	ation Health shers, Thors an Studies F ng House, N Publisher, Lu	ons Cl ons Cl ublishe lew De ucknow	ports assic ers, 2 lhi, 2 1, 202	s- I", Kalya s edition, 007 009 20	ani 2015

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3.	http://nss.nic. in
4.	http://socialworknss.org/about.html
5.	Young Journal on Youth published by SAGE: http://you.sagepub.com
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Evaluation Methods

Assessment		Total Marks				
Assessment	Attendance	Attendance MCQ Test Presentation / Activity / Assignmen				
Marks	10	30	60	100		