

Program Education Objectives

The BTech Programs at IET, JKLU are designed to prepare students for continued learning and successful careers. Our alumni are expected to:

PEO1: Apply their technical knowledge, complex problem solving and research skills in professional practice.

PEO2: Continue their intellectual development through critical thinking, self- study, apprenticeship, higher education, professional development courses, as well as participation in research groups and professional networks.

PEO3: Serve as ambassadors for engineering and sustainability by exhibiting high professional standards with a deep sense of civic responsibility.

PEO4: Effectively communicate about technical and related issues.

PEO5: Embrace roles of team members and leaders in their career.

Program Outcomes

The graduates of BTech Programs at IET, JKLU will have following competencies:

PO 1: *Life-long learning*: Demonstrate inquisitiveness, open mindedness, and the ability to engage in independent and life-long learning in the broadest context of technological, organizational, economic, and societal changes.

PO 2: Citizenship, Sustainability, and Professional ethics

PO 2a: Demonstrate knowledge of constitutional values of liberty, equity, justice, and fraternity with understanding of the impact of the engineering solutions in societal and environmental contexts as well as a sense of responsibility for sustainable development.

PO 2b: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, cultural, and environmental issues and the consequent responsibilities relevant to the professional engineering practice.

PO 2c: Demonstrate commitment for professional integrity and excellence and respect for ethics, responsibilities and norms as prescribed for the engineering practice.

PO 3: Engineering knowledge and Modern tool usage

PO 3a: Demonstrate clear conceptual understanding of fundamentals of engineering specialization and cognitive flexibility to appropriately ‘transfer’ what has been learned in a context, to different situations.

PO 3b: Apply engineering thinking, computational thinking, and the knowledge of mathematics, natural and social sciences, engineering fundamentals, information technology, engineering specialization, and engineering management to the solution of complex engineering problems.

PO 3c: Create, select, modify, and apply appropriate techniques, best practices, standards, resources, and modern engineering and IT tools including prediction and modelling to engineering and social activities with an understanding of the limitations.

PO 4: Complex problem solving, Design and Research

PO 4a: Identify, formulate, review research literature, and analyze complex engineering problems to arrive at substantiated conclusions using critical thinking along with principles of mathematics, computing, engineering as well as natural and social sciences.

PO 4b: Use systems thinking and reflection to identify and consider underlying structures, patterns, volatility, uncertainties, complexities, ambiguities, complications, and risks to design and develop engineering solutions for complex problems to meet the specified and anticipated needs with appropriate concern for constraints, performance, sustainability, and professional ethics.

PO 4c: Use research-based knowledge and research methods including design of experiments, simulation, analysis and interpretation of data, and synthesis of the information to evaluate and improve the engineering solutions and practice.

PO 5: Individual & teamwork and Engineering management

PO 5a: Ability to work effectively as an individual and as a team member or leader in diverse and distributed teams, and in multidisciplinary settings.

PO 5b: Ability to apply engineering management principles to one's own and team's work to manage engineering projects and operations and in multidisciplinary environment.

PO 6: Communication: Ability to communicate effectively on complex engineering and technology activities, situations, problems, and solutions using verbal, textual, and pictorial elements with the colleagues, engineering community, users, clients, policy makers, and society at large with intellectual honesty, clarity, empathy, and compassion.

PO 7: Innovation and entrepreneurship:

PO 7a: Demonstrate enthusiasm and understanding to identify opportunities and translate research in engineering and other disciplines to conceive and design innovative engineering solutions for business, industry, and societal problems.

PO 7b: Demonstrate enthusiasm and understanding to conceive and plan technology based new ventures either as independent start-up businesses or within existing corporate structures.

Program Specific Outcomes

B.Tech. (Mechanical Engineering)

The Mechanical Engineering graduates of JKLU will be able to:

MEPSO1: Conceive, design, implement, and manage mechanical systems, components, and processes by using principles of machine design, production engineering, thermal engineering, computing, automation, sustainability and contemporary materials and tools.

MEPSO2: Serve in fields of engineering services, manufacturing, automobile, energy, EPC and mechatronics.

JK LakshmiPat University, Jaipur
Institute of Engineering and Technology
Department of Mechanical Engineering
Course Structure for the B. Tech (Batch 2019-2023)

Semester	Courses							Credits
I	Computational Data Analysis	Design and Prototyping	Experimental Science-I	Fundamentals of Communication				21
	ES1101	ES1102	AS1101	CC1101				
	(10s 2 0)	(6s 0 0)	(1 0 4)	(2 0 1)				
	10	6	3	2				
II	Calculus and Applied Mechanics	Fundamentals of Automation Engineering	Object Oriented Programming	Energy and Environmental Studies	Critical Thinking and Storytelling	Scientific Perspectives		20
	ES1103	ES1104	CS1101	ES1105	CC1102	AS1102		
	(6s 2 0)	(6s 2 0)	(1 0 4)	(1 0 0)	(2 0 1)	(Science Week)		
	6	6	3	1	2	2		
III	Materials Engineering	Computational Engineering Analysis-I	Engineering Measurements and Machines	Engineering Thermodynamics	Perspectives on Contemporary Issues	Management Perspectives		22
	ME1101	ES1106	ES1107	ME1102	CC1103	IL1101		
	(3 0 2)	(3 1 2)	(3 0 4)	(3 0 2)	(2 0 1)			
	4	5	5	4	2	2		
IV	Transport Phenomena	Strength of Material and Analysis	Computational Engineering Analysis-II	Production Technology-I	Communication and Identity	Introduction to Design	Mechanical Engineering CAD Lab	23
	ME1104	ME1105	ES1109	ME1106	CC1104	IL1102	ME1107	
	(3 0 2)	(3 0 2)	(3 1 2)	(3 0 2)	(2 0 1)	(Design Week)	(0 0 4)	
	4	4	5	4	2	2	2	
Practice School - I (PS1101) – (4 to 6 Weeks Duration) - 4 Credits								
V	Theory of Machines	Production Technology-I	DE-I	OE-I	Understanding and Managing Conflict	Introduction to Internet of Things	Automation Project	22
	ME1108	ME1109			CC1105	EE1111	PR1101	
	(3 0 2)	(3 0 2)			(2 0 0)			
	4	4	4	4	2	2	2	
VI	Design of Machine Elements	DE-II	Automobile Engineering	DE-III/ OE - II/Minor Project	Critical Thinking for Decisions at Workplace	Emerging Tech Week		20
	ME1110		ME1111		CC1106			
	(3 0 2)	(3 0 2)	(3 0 2)		2	2		
	4	4	4	4	2	2		
VII	DE-IV	DE-V	DE-VI	OE-III	Minor Project			20
					PR1103			
	4	4	4	4	4			
VIII	Practice School - II /Entrepreneurial Project/Research Project/Semester at a partner University							16
	Total Credits							168

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Course Code: AS1101

Course Name: Experimental Science-I

Course Outcomes: On successful completion of this course, the students will be able to:

- AS1101.1. analyze ferromagnetic properties of any magnetic material and differentiate Soft and hard materials.
- AS1101.2. analyze thermoelectric effect of metal junctions due to temperature differences.
- AS1101.3. analyze nuclear radiation with respect to distance and thickness of absorbing media.
- AS1101.4. measure electrical properties e.g., specific resistance, time constant of various electrical components.
- AS1101.5. use Schroedinger equation and quantum mechanical approach to analyze behavior of the quantum particle under different potentials.
- AS1101.6. differentiate hard and soft water by determining its hardness of different water samples.
- AS1101.7. analyze conductivity of samples by different techniques such as volumetric titrations and conductometric.
- AS1101.8. determine properties of the lubricant/oil samples by Pensky-Martens and Red Viscometer.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
AS1101.1	1				1									1			
AS1101.2	1																
AS1101.3	1										1						
AS1101.4	1				1						1						
AS1101.5	1																
AS1101.6	1		1		1	1	1				1		1		1		
AS1101.7	1		1				1				1		1				
AS1101.8	1																

Course Code: CC1101

Course Name: Fundamentals of Communication

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

CC1101.1. Identify different cultural differences and their impact on communication.

CC1101.2. Compose grammatically correct sentences and paragraphs.

CC1101.3. Deliver effective oral presentations following appropriate kinesics and paralinguistic features.

CC1101.4. Identify impact of cultural differences on communication.

CC1101.5. Apply appropriate communication skills across settings, purposes, and audiences.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CC1101.1									1		1		1				
CC1101.2																	
CC1101.3	1										1						
CC1101.4																	
CC1101.5	1										1		1				

Course Code: ES1101

Course Name: Computational Data Analysis

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

- ES1101.1. Write Simple Python programs using various datatypes, control structures, decision statements, libraries, functions (M1)
- ES1101.2. Develop Python programs using Objects, Classes and Files (M1, M2)
- ES1101.3. Develop Programs for analyzing and interpreting Complex situations in various domains including sustainable development by combining various Linear Algebra, Statistics and Other Problem-Solving Techniques (M3)
- ES1101.4. Model Complex systems as Linear simultaneous equations and analyze the same using Matrix methods (M1)
- ES1101.5. Model Data as matrices and Find Eigen Values and Eigen Vectors and Apply the same for problem solving, e.g., ranking and performance analysis (M1)
- ES1101.6. Summarize and Visualize different datasets (M2)
- ES1101.7. Analyze and interpret different datasets using Discrete and Continuous Probability Distributions and Apply the same for problem solving, e.g., Goodness of Fit (M2)
- ES1101.8. Formulate and validate hypothesis with reference to different datasets (M2)
- ES1101.9. Apply correlation, regression, least square method and time series analysis for modeling, analysis, interpretation, and forecasting (M2)

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO -1	PSO-2
ES1101.1																	
ES1101.2											1						
ES1101.3					1	1					1			1			
ES1101.4			1		1	1				1	1						
ES1101.5			1		1	1				1	1			1			
ES1101.6					1	1		1			1		2				
ES1101.7		1	1		1	1		1			1		1	1			
ES1101.8		1	1		2	1		2			1		1	1			
ES1101.9		1	1		2	1		2		1	1		1	1			

Course Code: ES1102

Course Name: Design and Prototyping

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

- ES1102.1. Approach design challenges from the perspective of the user and offer innovative solutions effectively.
- ES1102.2. Communicate and work in team towards a common goal.
- ES1102.3. Think creatively towards a fun based, desirable solution.
- ES1102.4. Develop the projection views of the products with dimensions and scales.
- ES1102.5. Create the schematic diagram and isometric view of the parts using AutoCAD.
- ES1102.6. Fabricate prototype by combining the different parts.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1102.1	2	1	1	1										2			
ES1102.2											1	1	1				
ES1102.3	2				2	1	1	1						2			
ES1102.4					1	1	1										
ES1102.5	1				2	1	1										
ES1102.6	2				2	1	1				1	1	1				

Course Code: AS1102

Course Name: Scientific Perspectives

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

- AS1102.1. Distinguish between science, pseudo-science and other forms of knowledge.
- AS1102.2. Distinguish between science, engineering, technology and mathematics and also identify the opportunities for integrating these disciplines.
- AS1102.3. Use the scientific approach to identify and understand the societal problems
- AS1102.4. Explain, Design and carry out Scientific studies

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
AS1102.1	1												1				
AS1102.2					1	1											
AS1102.3		1			1												
AS1102.4	1												1				

Course Code: CC1102

Course Name: Critical Thinking and Storytelling

Course Outcomes: On successful completion of this course, the student should be able to:

- CC1102.1. Formulate intelligent questions to investigate.
- CC1102.2. Evaluate information and argument for correctness, consistency, relevance, and validity.
- CC1102.3. Compose well-structured and well-reasoned arguments.
- CC1102.4. Articulate and evaluate the impact of narratives.
- CC1102.5. Distinguish between facts, assumptions and opinion.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes		
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2	
CC1102.1			1					1										
CC1102.2			1			1							1					
CC1102.3											1							
CC1102.4													1					
CC1102.5													1					

Course Code: CS1101

Course Name: Object Oriented Programming

Course Outcomes: On successful completion of this course, the students should be able to:

- CS1101.1. Develop Java Programs with the concepts of primitive data types, strings and arrays.
- CS1101.2. Develop Java Programs using Object Oriented Programming Principles such as Classes, Objects, Data Abstraction, Data Encapsulation, Overloading, Overriding, Polymorphism, Inheritance, and Interfaces.
- CS1101.3. Design, develop and debug programs in Core Java using coding and documentation standards.
- CS1101.4. Incorporate exception handling in Java Programs.
- CS1101.5. Use JDBC API connectivity in between Java Programs and database.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CS1101.1					1	1	1							1			
CS1101.2																	
CS1101.3					1	1					1	1		1			
CS1101.4																	
CS1101.5											1	1					

Course Code: ES1103

Course Name: Calculus and Applied Mechanics

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

- ES1103.1. apply analytical techniques to determine forces in structures
- ES1103.2. use commercial software (STAAD Pro.) to simulate a structure/frame and determine force in the members
- ES1103.3. model physical phenomena using calculus and solve using appropriate method
- ES1103.4. apply Newton’s laws of motion and understand the concepts of dynamics concepts (force, momentum, work and energy)
- ES1103.5. interpret the geometrical significance of differential and integral calculus
- ES1103.6. solve problems of vector differentiation and integration
- ES1103.7. calculate the buoyant forces of objects with various shape and carryout the stability analysis
- ES1103.8. apply the concept of partial differentiation to solve optimization problems

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1103.1						2					1		2				
ES1103.2						2	2				1						
ES1103.3	1				1	2	2		1		2		1				
ES1103.4	2				1	2	2				1						
ES1103.5	1				1	2	2										
ES1103.6						1	1										
ES1103.7						1	1		1		1		2				
ES1103.8						2	1				1		1				

Course Code: ES1104

Course Name: Fundamentals of Automation Engineering

Course Outcomes: On successful completion of this course, the students should be able to:

- ES1104.1. Analyze electrical circuits using network theorems,
- ES1104.2. Measure electrical parameters of passive as well as active electrical components,
- ES1104.3. Design rectifier circuit using semiconductor devices,
- ES1104.4. Design filters for power conditioning,
- ES1104.5. Design and test a linear power supply for given specifications,
- ES1104.6. Design and build Printed Circuit Boards,
- ES1104.7. Use electrical safety practices while working on electrical projects,
- ES1104.8. Formulate mathematical models for basic electro-mechanical systems,
- ES1104.9. Design and simulate a basic analog open-loop control system,
- ES1104.10. Evaluate and simplify Boolean functions and design the minimized logic using logic gates,
- ES1104.11. Design basic combinational and sequential circuits with minimum complexity,
- ES1104.12. Implement combinatorial circuit using simulation tools.

Course Outcome	Correlation with program outcomes														Correlation with program specific outcomes		
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1104.1.					2			1									
ES1104.2.						2								1			
ES1104.3.					1			1									
ES1104.4.					2							1		1			
ES1104.5.					1							1		1			
ES1104.6.							1		1			1		1			
ES1104.7.	2						2						1				
ES1104.8.	2				2			2						2			
ES1104.9.					1							1		1			
ES1104.10.																	
ES1104.11.	2				2							1					
ES1104.12.						2			2			1	1	1			

Course Code: ES1105

Course Name: Energy and Environmental Studies

Course Outcomes: On successful completion of this course, the student should be able to:

ES1105.1. Relate renewable energy with ecology & environment

ES1105.2. Explain the climate change and threat to biodiversity

ES1105.3. Describe the various pollution sources and their impacts on Environment

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes		
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2	
ES1105.1	1					1												
ES1105.2		1									1							
ES1105.3	1				1													

Course Code : ME1101
Course Name : Materials Engineering

Course Outcomes : On successful completion of this course, the students be able to

- ME1101.1. Identify crystal structure, crystal defects and perform various mechanical tests as per ASTM standards to know properties of materials.
- ME1101.2. Evaluate materials on the basis of their static and dynamic failure criteria as per ASTM standards.
- ME1101.3. Perform various heat treatment processes to hold required mechanical properties in ferrous alloys.
- ME1101.4. Prioritize other ferrous and non-ferrous alloys for various applications.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1101.1					1	1	1					1				1	1
ME1101.2					1	1		1	1		1	1				1	1
ME1101.3	1				1	1	1	1	1							1	2
ME1101.4	1				1	1		1	1		1	1				1	1

Course Code: ES1106

Course Name: Computational Engineering Analysis – I

Course Outcomes: On successful completion of this course, the students will be able to

- ES1106.1. Solve ordinary differential equations through various techniques.
- ES1106.2. Determine the structural behavior of the body by determining the stresses, strains produced by the application of load.
- ES1106.3. Analyze the concept of buckling and be able to solve the problems related to column and struts.
- ES1106.4. Model the problems of column and struts mathematically in terms of ordinary differential equations and solve them using the appropriate method.
- ES1106.5. Simulate the solutions of the above-mentioned models of columns and struts.
- ES1106.6. Analyze a function of complex variables in terms of analyticity, poles and zeroes.
- ES1106.7. Find Laplace and inverse Laplace transforms of given function and use Laplace transform to solve ordinary differential equations.
- ES1106.8. Design and Evaluate the LC, RC & RL Networks using Foster's and Cauer Forms
- ES1106.9. Analyze stability criteria for electrical network using pole zero plot and Routh-hurwitz polynomials
- ES1106.10. Model and simulate electrical networks using Proteus simulator/ Virtual lab.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1106.1					2	2	2	1	1		1	1					
ES1106.2					2			2									
ES1106.3					1			1							1		
ES1106.4		1			1	2	2	1	1	1	2	1					
ES1106.5							2	1		1							
ES1106.6					2												
ES1106.7					2	2	1	1	1		1	2					
ES1106.8					2	2		2			1	1		1			
ES1106.9					2	2		1			1	1					
ES1106.10	1						1		1								

Course Code: ES1107

Course Name: Engineering Measurements and Machines

Course Outcomes: On successful completion of this course, the students be able to

- ES1107.1. Evaluate suitable electrical and non-electrical instruments for measuring physical quantities.
- ES1107.2. Analyze the construction, characteristics and applications of various types of rotating machines.
- ES1107.3. Analyze the working of any mechanical and electrical machine using mathematical model.
- ES1107.4. Integrate the sensors for monitoring and automation of electrical and mechanical systems.
- ES1107.5. Design electro-mechanical machines as per Indian standards.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1107.1	2				2	1	1				1	1	1	1			
ES1107.2		1			1	1	1	1									
ES1107.3					1	2	1	1	1		1						
ES1107.4	1	1	1		1	1	1	1	1		1		1				
ES1107.5	1		1	1	1	1	1	1	1		1	1					

Course Code : ME1102
Course Name : Engineering Thermodynamics
Course Outcomes : On successful completion of this course, the students be able to

- ME1102.1. identify the basic thermodynamic processes in our day to day life and industrial processes
- ME1102.2. judge the state of the pure substances such as compressed liquid, saturated liquid-vapor mixture and superheated vapour using property diagrams and tables.
- ME1102.3. apply the first law of thermodynamics to analyse the working of the nozzles, diffusers, turbines, compressors, throttling valves, mixing chambers, heat exchangers, pipe and duct flow
- ME1102.4. construct energy and mass balance for unsteady-flow processes.
- ME1102.5. assess thermodynamic applications using second law of thermodynamics to power and refrigeration cycle.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1102.1	1				1			1								2	2
ME1102.2					1											2	2
ME1102.3	1					1	1			1		1	1	1		2	2
ME1102.4		1			1	1		1								2	2
ME1102.5			1		1		1					1	1			2	2

Course Code: CC1103

Course Name: Perspectives on Contemporary Issues

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

- CC1103.1. Identify different perspectives objectively.
- CC1103.2. Explain interconnectedness of the issues and their impact at micro and macro levels.
- CC1103.3. Recognize their own beliefs, biases, claims and assumptions.
- CC1103.4. Evaluate sources, argue and defend effectively.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CC1103.1	1		1					1			1	1					
CC1103.2						1					1	1	1				
CC1103.3											1	1	1				
CC1103.4	1		1									1	1				

Course Code: IL1101

Course Name: Management Perspectives

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

- IL1101.1. Comprehend the importance of management and its functional areas in businesses and also its interaction with technology.
- IL1101.2. Highlight specific external and internal issues impacting businesses.
- IL1101.3. Integrate and analyze multiple dimensions of management aspects to solve business problems.
- IL1101.4. Evaluate the aspects that management might consider when evaluating technical and engineering projects such as planning and scheduling, personnel management, cost control etc. from a management perspective

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes		
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2	
IL1101.1	1				1													
IL1101.2	1	1											1					
IL1101.3	2		1		1						1		1					
IL1101.4	1			1							2	1						

Course Code : ME1104
Course Name : Transport Phenomena

Course Outcomes : On successful completion of this course, the students be able to

- ME1104.1. identify the basic transport processes in our day to day life and industrial processes
- ME1104.2. apply the continuity, momentum and energy principles and dimensional analysis
- ME1104.3. formulate and analyse a heat transfer problem involving any of the three modes of heat transfer
- ME1104.4. apply the appropriate correlations to calculate heat transfer coefficient and heat flux for a range of heat transfer situations (Steady and unsteady)
- ME1104.5. design and model a real life low energy heat transfer equipment as per ASME standard
- ME1104.6. analyse the combined effect of heat, mass and momentum transport in a typical chemical engineering equipment (heat exchanger, catalyst bed, chemical reactor, etc.)

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1104.1	1				1		1	1								2	
ME1104.2					1	1		1								2	2
ME1104.3	1				1		1	1		1						2	2
ME1104.4		1						1				1				2	2
ME1104.5		1				1						1	1	1		2	2
ME1104.6	1		1		1							1	1	1		2	2

Course Code : ME1105
Course Name : Strength of Material and Analysis

Course Outcomes : On successful completion of this course, the students be able to

- ME1105.1. identify stress and strain present in a mechanical system.
- ME1105.2. analyze and evaluate 1-D and 2-D stress tensor in a specimen.
- ME1105.3. analyze shear force and bending moment diagrams for a beam under different loading conditions.
- ME1105.4. design shafts against torsion load for different application.
- ME1105.5. design columns against buckling load for various end conditions.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes		
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2	
ME1105.1			1		1	1											1	
ME1105.2			1		2	1												
ME1105.3	1		1		1	1												
ME1105.4			1		1													
ME1105.5	1		1		1												1	1

Course Code: ES1109

Course Name: Computational Engineering Analysis – II

Course Outcomes: On successful completion of this course, the students be able to

- ES1109.1. Classify various types of partial differential equations and solve them through various analytical and numerical methods.
- ES1109.2. Formulate and analyze differential equations especially Navier stokes and energy equations and use numerical methods for solving the same.
- ES1109.3. Use Numerical method for solving partial differential equations using finite difference method.
- ES1109.4. Find Fourier and inverse Fourier transforms of given function and use Fourier transform to solve partial differential equations.
- ES1109.5. Find Z-transform and inverse Z-transforms of given functions and use them to analyze control systems.
- ES1109.6. Design and analyse various types of filters and attenuators to minimize power losses and improve signal quality.
- ES1109.7. Solve problems involving vertex and edge connectivity, planarity and crossing numbers.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ES1109.1	1				1	1		1			1						
ES1109.2	2		2		2	2	1	2			1		1	2			
ES1109.3						1	2										
ES1109.4					2	2		1			1						
ES1109.5	1		1		2	2		1			1			1			
ES1109.6		1				1	2			2				1			
ES1109.7						1	2	2						1			

Course Code : ME1106
Course Name : Production Technology - I

Course Outcomes : On successful completion of this course, the students be able to

- ME1106.1. Design molding system to obtain defect free cast.
- ME1106.2. Analyze various welding processes for different applications.
- ME1106.3. Identify non-conventional manufacturing process to manufacture intricate shaped product accurately.
- ME1106.4. Identify latest manufacturing systems and processes for manufacturing of components.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1106.1	1				1	1	1	1	1	1	1	1		1	1	1	2
ME1106.2	1					1	1	1	1	1		1				1	2
ME1106.3											1	1					1
ME1106.4	1				1	1	1										1

Course Code: CC1104

Course Name: Communication and Identity

Course Outcomes: On successful completion of this course, the students be able to

CC1104.1. Analyse their personal identities, both private and social

CC1104.2. Identify their different values, strengths and areas of professional interest

CC1104.3. Articulate their personal statement and use it to craft an influential pitch

CC1104.4. Express themselves through various communication formats on different platforms

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CC1104.1													1	1			
CC1104.2	1		2	1										2			
CC1104.3													1				
CC1104.4													2				

Course Code: IL1102

Course Name: Introduction to Design

Course Outcomes: On successful completion of this course, the students be able to

- IL1102.1. Identify the user and build persona of the
- IL1102.2. Sketch their ideas on paper to visualize and assess viability.
- IL1102.3. Create a plan for process and management to materialize the desired idea.
- IL1102.4. Test the material for possibilities and capabilities.
- IL1102.5. Develop skills of joinery, material manipulation and various hand tools.
- IL1102.6. Develop technical and narrative skills useful for both film and animation.
- IL1102.7. Develop troubleshooting and problem-solving skills.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
IL1102.1	1								1	1			1	1			
IL1102.2	2						1						2				
IL1102.3	1						1	1						2			
IL1102.4	1						1	1									
IL1102.5							1	1									
IL1102.6	2						1						1				
IL1102.7	1		1			1	1										

Course Code : ME1107
Course Name : Mechanical Engineering CAD Lab

Course Outcomes : On successful completion of this course, the students be able to

- ME1107.1. identify surface roughness number and symbol, symbols of machine elements and welded joints limit.
- ME1107.2. assess limits, fits and tolerance for machine elements in engineering drawings.
- ME1107.3. develop geometrical models for different machine components.
- ME1107.4. develop assembly and detailed drawings of engine parts.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1107.1																	1
ME1107.2									1							1	
ME1107.3									1		1						
ME1107.4							1		1		1		1				1

Course Code : ME1108
Course Name : Theory of Machines

Course Outcomes : On successful completion of this course, the students be able to

ME1108.1. Compare and develop various application based linkages and mechanisms

ME1108.2. Analyze velocity and acceleration polygon of different types of mechanisms.

ME1108.3. Analyze the cam and follower mechanism in order to optimize the power consumption.

ME1108.4. Prioritize among various mechanisms like belt, rope and chain drive systems in order to minimize energy consumption.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1108.1	1				1	1	1				1	1		1		2	2
ME1108.2	1				1	1	1		2			1		1		2	2
ME1108.3	1				1	1	1	1	1					1		2	2
ME1108.4	1				1	1	1	1	1		1	1		1	2	2	1

Course Code : ME1109
Course Name : PRODUCTION TECHNOLOGY - II
Course Outcomes :

- ME1109.1. Design load capacity of forming equipment to perform various bulk forming and sheet forming operations.
- ME1109.2. Design of machining tools, forming tools and holding tools for various forming and machining processes.
- ME1109.3. Calculate force required for machining metallic materials using appropriate cutting tool materials and cutting fluids.
- ME1109.4. Use cutting, milling, and finishing operations to shape materials and evaluate their surface finish using conventional and automatic machines.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1109.1	1				2	1	1	1	1	1				1	1	2	2
ME1109.2					1	1	1	1	1	1				1		2	2
ME1109.3	1				2	1	1	1	1	1				1	1	2	1
ME1109.4					1	1	1	1	1	1				1		2	1

Course Code: CC1105

Course Name: Understanding and Managing Conflict

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

CC1105.1. Define a group and explain the stages of group development

CC1105.2. Describe conflict and explain types and causes of conflict

CC1105.3. Use inquiry and advocacy to engage with groups

CC1105.4. Give and receive feedback effectively

CC1105.5. Identify sources of conflict and manage them using difference conflict handling styles

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CC1105.1	1										2		1				
CC1105.2	1						1										
CC1105.3	1		1					1			2	1	1				
CC1105.4	1										1		1				
CC1105.5	1										1	1	1				

Course Code: EE1111

Course Name: Introduction to IoT

Course Outcomes: On successful completion of this course, the students should be able to:

- EE1111.1. Interface the Analog and Digital sensors to Node-MCU
- EE1111.2. Develop Embedded C programs to read sensor data and upload to public cloud platform.
- EE1111.3. Use Python-based IDE (integrated development environments) for the Raspberry Pi
- EE1111.4. Interface Raspberry Pi with I/O devices.
- EE1111.5. Visualize sensor data uploaded on public cloud.
- EE1111.6. Apply standard protocol(s) for implementation of IoT Systems.
- EE1111.7. Analyze and Improve existing systems with innovative IoT based approaches.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
EE1111.1								1		1	1						
EE1111.2							1	1	1		1						
EE1111.3								1		1							
EE1111.4								1	1	1	1		1	1			
EE1111.5							1	1		1	1			1			
EE1111.6									1	1			1	1			
EE1111.7									1	1	1						

Course Code: PR1101

Course Name: Automation Project

Course Outcomes: On successful completion of this course, the students should be able to:

- PR1101.1. Design and implement a complete project in IoT/Automation using microcontroller/SOC interfaced with sensors or any other automation hardware/tools.
- PR1101.2. Apply anyone/more standard data communication/IoT protocol(s).
- PR1101.3. Use cloud servers for data streaming/logging and analytic techniques.
- PR1101.4. Implement algorithms/signal processing using the data at edge/cloud.
- PR1101.5. Deploy techniques to conserve bandwidth/energy/other resources and achieve cost economy for project.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
PR1101.1	2				2					2		2		3			
PR1101.2						2											
PR1101.3							2										
PR1101.4	2								2								
PR1101.5					2		2										

Course Code : ME1110

Course Name : Design of Machine Elements- ME1110

Course Outcomes : On successful completion of this course, the students be able to

ME1110.1. Design and evaluate shafts to work under different service loading conditions as per ASTM/BIS standards.

ME1110.2. Design bearings for various applications as per ASTM/BIS standards.

ME1110.3. Design, evaluate gears for various applications as per ASTM/BIS standards.

ME1110.4. Design springs for various systems as per ASTM/BIS standards.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1110.1	1	1			1	1	1	1						1		2	2
ME1110.2			1	1	1	1	1	1						1		2	2
ME1110.3	1			1	1	1	1	1	1					1	1	2	2
ME1110.4	1			1	1	1	1	1	1					1	1	2	2

Course Code : ME1111

Course Name : Automobile Engineering

Course Outcomes : On successful completion of this course, the students be able to

ME1111.1. Identify different part of the automobile.

ME1111.2. Design and explain the working of various parts like engine, transmission, clutch and brakes.

ME1111.3. Design a steering and suspension system.

ME1111.4. Identify Euro6 standards for automobile emissions.

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
ME1111.1	1		1	1	1	1	1				1			1	1	2	2
ME1111.2	1	1	1	1	1	1					1			1	1	2	2
ME1111.3	1	1	1	1	1									1	1	2	2
ME1111.4	1	1		1	1		1							1	1	2	2

Course Code: CC1106

Course Name: Critical Thinking for Decisions at Workplace

Course Outcomes: On successful completion of this course, the students be able to

- CC1106.1. Apply techniques of Critical Thinking to analyse organisational problems through positive inquiry
- CC1106.2. Describe and analyse appropriate problem-solving and ethical decision-making processes
- CC1106.3. Choose the most effective and logical decision among multiple alternatives
- CC1106.4. Evaluate solutions and anticipate likely risks based on purpose, context and ethics

Course Outcome	Correlation with program outcomes															Correlation with program specific outcomes	
	PO 1	PO 2a	PO 2b	PO 2c	PO 3a	PO 3b	PO 3c	PO 4a	PO 4b	PO 4c	PO 5a	PO 5b	PO 6	PO 7a	PO 7b	PSO-1	PSO-2
CC1106.1	1										2		2				
CC1106.2	2					1		2					1				
CC1106.3									1		1	2	1				
CC1106.4							1	2				2					