SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

Academic Year : 2023-2024
Institute/ Branch Name : Symbiosis Institute of Technology Programme Name : Bachelor of Technology (Mechanical Engineering)

Color Code Description:

Global	National / Local	Regional / National	Relevance

Sr. No.	GA No.	Graduate Attributes	PO No.	Programme Outcomes	
1	GA1	Scholarship: research, inquiry and lifelong learning	PO1	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.	
2	GA1	Scholarship: research, inquiry and lifelong learning	PO2	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	
3	GA1	Scholarship: research, inquiry and lifelong learning	PO3	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.	
4	GA1	Scholarship: research, inquiry and lifelong learning	PO4	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.	
5	GA2	Global citizenship: ethical, social and professional understanding	PO5	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.	
6	GA2	Global citizenship: ethical, social and professional understanding	PO6	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.	
7	GA3	Eco-literate: sensitivity towards a sustainable environment	PO7	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	
8	GA2	Global citizenship: ethical, social and professional understanding	PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.	
9	GA2	Global citizenship: ethical, social and professional understanding	PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	
10	GA2	Global citizenship: ethical, social and professional understanding	PO10	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.	Regional / National
11	GA1	Scholarship: research, inquiry and lifelong learning	PO11	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.	Regional / National
12	GA1	Scholarship: research, inquiry and lifelong learning	PO12	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.	Regional / National
13	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO13	Create creative, innovative and socially relevant systems which are using knowledge and application of mechanical engineering components	Regional / National
14	GA4	Employability: equipped with skills, attributes, leadership and entrepreneurial qualities that society needs; being capable of making a contribution to society through earning a living	PO14	Acquaint with the contemporary trends in industry and use knowledge of advance tools and techniques for research and development in cutting edge areas	Global

Sr. No.	Semester	Institute Course Code	Catalog Course Code	Title	Course Outcome No	Course Outcome Statement	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
1	SEM VII	070125701 - PP	T2207	Operations Research	CO1	Formulate complex mathematical models from the verbal description of the real system in management science and industrial engineering using correct decision variables.	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-	Moderate-M	Weak-L
1					CO2	Identify and apply the mathematical tools from algebra and calculus for the solution methods for linear programming, transportation and assignment models. Also use mathematical software to solve the proposed models.	Strong-H	Strong-H	Strong-H	-	Strong-H	-	-	-	-	-	-	-	Moderate-M	Weak-L
1					CO3	Understand and apply the concept of game theory to practical situations.	Weak-L	Moderate-M	-	Weak-L	Strong-H	-	-	-	-	-	-	-	Moderate-M	Weak-L
1					CO4	Compare the various replacement / inventory models and choose the best alternative with minimum maintenance cost/ inventory costs.	Strong-H	Strong-H	Strong-H	-	Moderate-M	-	-	-	-	-	-	-	Moderate-M	Weak-L
1					CO5	Evaluate and review the network, determine the critical path and estimate the cost of the project.	-	Strong-H	Strong-H	-	Strong-H	-	-	-	Moderate-M	-	Strong-H	-	Moderate-M	Weak-L
1					CO6	Evaluate and review the network, determine the critical path and estimate the cost of the project.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
2	SEM VII	070125702 - PIS	T7804	B.Tech. Project	CO1	Design develop methodology by application of core engineering fundamentals aided by modern engineering tools software	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-	Weak-L	-	Moderate-M	Moderate-M	-	Strong-H	-	-
2					CO2	Design and build socially relevant projects that meet the stated specifications.	-	-	-	-	-	-	-	-	Strong-H	-	Strong-H	Strong-H	-	-
2					CO3	Work in a team and carry out the project activities like design/ analysis/ manufacturing as required for the project	Strong-H	-	Strong-H	-	Moderate-M	-	-	-	Moderate-M	Moderate-M	Moderate-M	Strong-H	-	-
2					CO4	Validate the project by performing testing. Prepare project report and present the project before panel members	-	-	-	-	Weak-L	-	-	-	Moderate-M	Strong-H	Weak-L	Strong-H	-	-
2					CO5	Communicate ideas and solutions effectively both verbally and in writing.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2					CO6	Act with integrity, show initiative and leadership and accept responsibility while working towards stated goals.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	SEM VII	070125703 - PP	T7674	Cyber Security	CO1	Analyze and illustrate threat models	-	-	-	-	-	-	Weak-L	Weak-L	-	-	-	-	-	-
3					CO2	Examine the different cyber laws and their importance	-	-	-	Weak-L	Weak-L	-	Weak-L	Weak-L	-	-	-	-	-	-
3					CO3	Compare and contrast the implemented management practices in the cyber world	-	-	-	Moderate-M	-	Moderate-M	Weak-L	Moderate-M	-	-	-	-	-	-
4	SEM VII	070125704 - PP	T7624	Industrial Fluid Power	CO1	Explain the different components used in a fluid power system and illustrate the basic principles and working of various hydraulic machines.	Weak-L	-	-	-	-	-	-	Strong-H	Strong-H	-	-	Moderate-M	-	-
4					CO2	Explain the principle of working and constructional details of pumps.Select pump for hydraulic power transmission based on the characteristic curves and efficiency of pump.	Weak-L	Strong-H	-	-	-	-	Moderate-M	Strong-H	Strong-H	-	-	Moderate-M	-	-
4					CO3	Interpret the necessity of fluid control through direction control valve, pressure control valve and flow control valve.	Weak-L	Strong-H	-	-	-	-	-	Strong-H	Strong-H	Moderate-M	-	Moderate-M	-	-
4					CO4	Draw hydraulic and pneumatic circuits for practical applications.	Weak-L	Weak-L	Strong-H	Strong-H	-	-	-	Strong-H	Strong-H	Moderate-M	-	Weak-L	-	-
4					CO5	Explain the principle working of pneumatic system.	Weak-L	Strong-H	-	-	-	-	Moderate-M	Strong-H	Strong-H	-	-	Moderate-M	-	-
4					CO6	Demonstrate the needed analytical skills in handling basic hydraulic and pneumatic calculations.	Weak-L	Weak-L	-	Strong-H	-	-	-	-	-	-	-	Strong-H	-	-
5	SEM VII	070125705 - PP	T7622	Industrial Aotomation and Robotics	CO1	Understand production systems and application of automation system in production systems.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
5					CO2	Understand industrial control system and its components.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
5					CO3	Understand basic components of robot and its applications.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L

5					CO4	Understand mechanism of robots and end effectors. Force analysis of grippers.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
5					CO5	Understand applications of automation in material handling equipmentsand identification methods.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
5					CO6	Understand applications of automation in different manufacturing systems.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
6	SEM VII	070125706 - PP	TE7070	Nature Inspired Optimization Techniques	CO1	Understand the use of modern optimization techniques.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
6					CO2	Apply Genetic Algorithm and Simulated Annealing to various engineering problems.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
6					CO3	Understand and apply the algorithm of Particle Swarm Optimization and Ant Colony Optimization to various engineering problems.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
6					CO4	Understand and apply Cohort Intelligence approach to various engineering problems.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
7	SEM VII	070125707 - PP	T7645	Power Plant Engineering	CO1	Classify and compare Steam, gas, Diesel and Hydro power plants, nuclear Power plants. Explain construction, and working of power plants. Explain siting considerations of power plants	Strong-H	-	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-
7					CO2	Compare various types of reactors and explain site selection for reactor and waste disposal of the reactor	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO3	Classify various type of fuels used in thermal power plant and explain their handling, combustion etc. Explainash handling and dust collectionmechanism, draught system, principle of fluidized bed combustion	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO4	Describe structure of high pressure boilers, recognize features of HP boilers, understand working principles of HP boilers	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO5	Explain principle of Steam nozzles, variation of velocity and pressure, choking of nozzle, nozzle efficiency etc., Classify various types of nozzles and diffusers Explaineffect of friction, velocity coefficient, examine nozzle efficiency. Explain supersaturated flow.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO6	Classify different types of condensers and explain Dalton's law of partial pressure, condenser efficiency, condenser vacuum and vacuum efficiency, etc. Illustrate construction of various types of condensers and explain their functioning etc. Analyse effect of air on condenser efficiency	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO7	Compare different type of Steam turbines and explain their constructional details, losses, overall efficiency, constructional feature of blades etc. Analyse performance of steam turbines	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
7					CO8	Explain and analyze various economic factors associated with power generation like unit energy cost, load factor, plant capacity factor etc. Explain load curves and compare performance of different capacity power plants.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-
8	SEM VII	070125708 - PP	TE7072	Total Quality Management	CO1	To gain an understanding and appreciation of different dimensions of quality and quality tools	Strong-H	Moderate-M	Weak-L	-	-	-	Weak-L	Weak-L	-	-	-	-	Strong-H	Moderate-M
8					CO2	Description of the various philosophies of evolution of quality.	Strong-H	Moderate-M	Moderate-M	-	-	-	Weak-L	Weak-L	-	Weak-L	-	-	Strong-H	Moderate-M
8					CO3	Explain the importance of quality control and apply statistical techniques to measure quality control.	Strong-H	Moderate-M	Weak-L	Weak-L	-	Weak-L	Weak-L	Weak-L	-	Weak-L	-	-	Strong-H	Moderate-M
8					CO4	To apply various quality improvement techniques and to understand quality management system	Strong-H	Moderate-M	Moderate-M	Weak-L	-	Weak-L	Weak-L	Weak-L	-	-	-	-	Strong-H	Moderate-M
9	SEM VII	070125709 - PP	TE7071	Tribology	CO1	To understand the concept of friction wear and lubrication	Strong-H	-	Weak-L	-	-	-	-	-	-	-	-	-	-	-

9					CO2	Differentiate various types of wear and friction and to understand the effect of coefficient of friction on wear properties of different materials.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
9					CO3	To analyze the dynamic and static strength of materials based on fatigue failure theories concepts and their application to design of bearing.	Moderate-M	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
9					CO4	Recognize the working of bearings under different lubricating conditions.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
10	SEM VII	070125710 - PP	T7456	Town and country Planing	CO1	State the objectives and principles of town planning. List the different stages in town planning with their settlement patterns and physical forms and explain the physical planning process with surveys and plan, land-use planning	Strong-H	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
10					CO2	Discuss different planning standards for the physical planning of a town.	-	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
10					CO3	Describe the spatial aspects of planning for rural and urban settlements. Describe the physical growth characteristics and the relative socio-economic consequences	-	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
10					CO4	Discuss the different levels in planning like development plan, regional plan with their characteristics. Discuss the role different organizations involved in planning. Discuss the role of acts regulation in the field of planning.	-	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
10					CO5	Explain different types of landscaping with application in modern and historical eras. Locate and prepare the layout plans, neighbourhood plans, town planning schemes for the different case studies.	-	-	Weak-L	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
10					CO6	Discuss the conservation- preservation of old core area of a city.	-	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	-	Weak-L	Weak-L	-
11	SEM VII	070125711 - PP	T7394	Smart Materials	CO1	Describe the importance of smart materials on the basis of their applications.	-	-	-	-	-	Moderate-M	Weak-L	-	-	-	-	Moderate-M	-	Strong-H
11					CO2	Understand the structure, electrical and magnetic properties of materials.	Strong-H	Strong-H	-	-	-	-	-	-	Weak-L	-	-	Moderate-M	Weak-L	Weak-L
11					CO3	Classify the smart materials in terms of their unique electric and magnetic properties	Strong-H	Strong-H	-	-	-	-	-	-	Weak-L	-	-	Moderate-M	Moderate-M	Moderate-M
11					CO4	Identify some special smart materials.	-	-	Moderate-M	-	-	Moderate-M	-	-	Strong-H	-	-	Weak-L	Strong-H	Strong-H
11					CO5	Understand some important application of smart materials	-	-	-	-	-	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	Weak-L	Strong-H
12	SEM VII	070125712 - PP	T7474	Basic of Detabase	CO1	Describe database system, its components and Identify various database architectures and applications. Also illustrate database design using E-R data model by identifying entities, attributes, relationships, generalization and specialization along with relational algebra.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
12					CO2	Distinguish relational model with the Structured Query Language (SQL).	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
12					CO3	Illustrate Normalization process with its types.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
12					CO4	Explain structure of file, types of Indexing and Hashing.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
13	SEM VII	070125713 - PP	T7650	Six Sigma	CO1	understand the importance of quality in service and manufacturing sectors.	Moderate-M	Weak-L	-	-	-	-	-	Moderate-M	-	-	-	Weak-L	-	-
13					CO2	demonstrate understanding of Six Sigma DMAIC process	-	Moderate-M	Moderate-M	Strong-H	-	-	-	-	Strong-H	Strong-H	Moderate-M	-	Moderate-M	-
13					CO3	Use software tools for statistical calculations required for six sigma projects	-	-	-	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-
14	SEM VII	070125714 - PP	T7584	Printed Circuite Board (PCB) Design	CO1	Acquire knowledge on PCB	Weak-L	-	-	-	-	-	-	Strong-H	Strong-H	-	-	Moderate-M	-	-
14					CO2	Learn PCB layout and general rules	Weak-L	Strong-H	-	-	-	-	Moderate-M	Strong-H	Strong-H	-	-	Moderate-M	-	-
14					CO3	Study PCB fabrication steps	Weak-L	Strong-H	-	-	-	-	-	Strong-H	Strong-H	Moderate-M	-	Moderate-M	-	-

14					CO4	Get familiarize with current trends in PCB	Weak-L	Weak-L	Strong-H	Strong-H	-	-	-	Strong-H	Strong-H	Moderate-M	-	Weak-L	-	-
14					CO5	Design PCB using CAD software tool	Weak-L	Strong-H	-	-	-	-	Moderate-M	Strong-H	Strong-H	-	-	Moderate-M	-	-
15	SEM VII	070125715 - PP	T7509	Open Source Technologies	CO1	Relate to the idea of adoption of Open Source Software (OSS) and Public Domain Software (PDS) in software development process.	Strong-H	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-
15					CO2	Identify and outline the need for licenses and patents.	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-
15					CO3	Analyze the basic idea of open source technology, their software development process.	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-
15					CO4	Examine and analyze various open source software and tools.	Strong-H	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-
15					CO5	Outline and distinguish between open source and closed source technologies.	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	-	-	-	Weak-L	-	-	Weak-L	-	-
16	SEM V	070125501 - PP	T7620	I.C. Engines	CO1	Understand thermodynamics principles, construciton andfundamentals of IC engines. Illustrate the need and importance of study of IC engines for mechanical engineers	Moderate-M	Strong-H	-	Strong-H	-	Strong-H	Moderate-M	Strong-H	-	-	-	Moderate-M	-	-
16					CO2	understand the functioning of Fuel system in SI and CI Engine and identificationof advanced systems in engine such as Electronic ignition system, M.P.F.I. system etc.	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	-	Moderate-M	-	-	-	-	Moderate-M	-	-
16					CO3	Discuss the construction and working of different supporting systems such as ignition system, engine cooling system, lubrication system, governing system etc.	Weak-L	Weak-L	Moderate-M	Weak-L	Strong-H	Strong-H	Weak-L	Strong-H	Weak-L	-	Strong-H	Strong-H	-	-
16					CO4	Understand the combustion phenomenon in the IC engine and discuss the effect of air-fuel ratio on the combustion in the IC engine.	Strong-H	Weak-L	-	Weak-L	Moderate-M	Moderate-M	Weak-L	Weak-L	Weak-L	Strong-H	-	Weak-L	-	-
16					CO5	Understand the importance of testing of IC engine and analyse performance parameters such as fuel consumption rate, brake power, indicated power and friction power of IC Engines	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
16					CO6	Understand and explain the effect of exhaust on emission and after treatment methods such as catalytic convertor, EGR etc. in IC engines.	Strong-H	-	-	-	-	-	-	Strong-H	-	-	-	-	-	-
17	SEM V	070125502 - PP	T7625	Machine Design - I	CO1	Understand and analyze the different stresses on mechanical components under different loading conditions.	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-
17					CO2	Identify the proper materials and factor of safety for design and development of engineering power transmitting devices.	Moderate-M	Weak-L	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-
17					CO3	Understand design & applications of various types of springs	Strong-H	Weak-L	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-
17					CO4	Understand design and applications of mechanical fasteners and permanent joints.	Strong-H	Weak-L	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-
18	SEM V	070125503 - PP	F0003	Flexi-Credit Course	CO1	Understand the concepts and applications of Mechatronics, automation and digital electronics.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
18					CO2	Illustrate mathematical modelling of systems, distributed control systems, hierarchical control systems and examine its applications in the process control industry. Understand and apply PID controlling.	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
18					CO3	Understand basic automation technologies and its industrial applications.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
18					CO4	Comprehend the concepts of microprocessors, microcontrollers, and PLC system and its ladder programming, and significance of PLC systems in industrial application.	Weak-L	Moderate-M	-	Moderate-M	-	-	-	Strong-H	-	-	-	-	-	-
18					CO5	Understand the concepts of robotics and its possible applications for automation.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
19	SEM V	070125504 - PP	F0003	Flexi-Credit Course	CO1	Reflect on the philosophical, historical, and sociological perspectives on science and technology to look at technology as practice deeply embedded in culture and society.	Strong-H	-	-	-	-	-	-	Strong-H	-	-	-	-	-	-

19					CO2	Deconstruct the relations between technology, society, and human values.	Weak-L	-	-	Strong-H	-	-	-	Strong-H	-	-	-	-	-	-
19					CO3	Articulate their understanding about technological shaping of society and social shaping of technology	Moderate-M	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
19					CO4	Relate their own lived experiences to universal philosophical concepts that illuminate the human relationship to technology	Weak-L	-	-	Strong-H	-	-	-	-	-	-	-	-	-	-
20	SEM V	070125505 - PP	T6749	Design Thinking	CO1	Understand design thinking concepts and process	Moderate-M	Moderate-M	-	-	-	-	-	-	Moderate-M	-	Moderate-M	Strong-H	-	-
20					CO2	Visualize and apply design thinking concepts to problem solving	Moderate-M	Strong-H	-	-	-	-	-	-	Moderate-M	-	Strong-H	Strong-H	-	-
20					CO3	Understand the idea, concept and tools of creativity, and innovation	Strong-H	Strong-H	-	-	-	-	-	-	Strong-H	-	Strong-H	Strong-H	-	-
20					CO4	Apply theory and knowledge of creativity to problem solving	Strong-H	Strong-H	-	-	-	-	-	-	Strong-H	-	Strong-H	Strong-H	-	-
21	SEM V	070125506 - PR	TE7290	Project Based Learning -I A 5506	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problem—even learning from failure and possibly starting over.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	SEM V	070125506 - PR	TE7290	Project Based Learning -I 5506	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problem—even learning from failure and possibly starting over.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	SEM V	070125506 - PR	TE7290	Project Based Learning -I	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problem—even learning from failure and possibly starting over.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	SEM V	070125507 - PR	T7621	I.C. Engines Lab	CO1	Illustrate andunderstandthe need and importance of study of internal combustion technologies.	Moderate-M	Weak-L	Moderate-M	Weak-L	-	Weak-L	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-
24					CO2	Explain the different Engine technologies such as electronic ignition system, M.P.F.I. DTSI, TDI, CDI system etc	Moderate-M	Weak-L	Weak-L	Moderate-M	Weak-L	-	Moderate-M	-	-	-	-	Moderate-M	-	-

24					CO3	Discuss the importance of engine testing and demonstrate and experiment with dynamometer.	Strong-H	Strong-H	-	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Strong-H	Weak-L	-	Strong-H	-	-
24					CO4	xplain the effect of various exhaust gases on the environment and demonstrate how to minimize them by using different techniques.	Weak-L	Strong-H	-	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Strong-H	Weak-L	-	Strong-H	-	-
25	SEM V	070125508 - PP	T7653	Theory of Machines - II	CO1	Conduct the dynamic forces analysis of the basic mechanism.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
25					CO2	Understand turning moment diagrams of engines for speed fluctuation & power smoothening using flywheels.	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
25					CO3	Understand the effect of unbalancing of rotating masses.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
25					CO4	Understand the process of speed control by using different governors.	Weak-L	Moderate-M	-	Moderate-M	-	-	-	Strong-H	-	-	-	-	-	-
25					CO5	Understand the concept of the gyroscopic couple on the stability of aeroplanes, ships and automobiles.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
26	SEM V	070125509 - PP	T7612	Fluid Machinery	CO1	Explain the importance of forecasting and demonstrate the ability to apply some mathematical forecasting techniques.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
26					CO2	Importance of demand in capacity planning and aggregate planning, their techniques and utilization in industry	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
26					CO3	Illustrate the different concepts of production planning and control (PPC) and define the functions of PPC.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
26					CO4	Understand and develop plant layout	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
26					CO5	Understand and implement the concepts of work study and time study	Strong-H	-	-	-	-	-	-	Strong-H	-	-	-	-	-	-
26					CO6	Perform systematic calculations to establish duty of a pump for a given duty. Make a proper selection of pump for the designed duty from the commercially available literature of different pump manufacturers.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
27	SEM V	070125510 - PP	T7647	Production Management	CO1	To gain an understanding and appreciation of the principles and applications relevant to the planning, design, and operations of manufacturing/service firms.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
27					CO2	To understand various layout in an organization and its importance.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
27					CO3	Explain the importance of forecasting and ddemonstrate the ability to apply some mathematical forecasting techniques.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
27					CO4	Importance of demand in capacity planning and aggregate planning, their techniques and utilization in industry	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
27					CO5	Illustrate the different concepts of production planning and control (PPC) and define the functions of PPC.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
27					CO6	Demonstrate the concept of TPM and illustrate various maintenance techniques	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
28	SEM V	070125511 - PR	T7654	Theory of Machines - II Lab	CO1	Conduct the dynamic forces analysis of a basic mechanism.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
28					CO2	Understand turning moment diagrams of engines for speed fluctuation & power smoothening using flywheels.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
28					CO3	Understand unbalancing of rotating masses.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
28					CO4	Understand the process of speed control by using governors.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
28					CO5	understand the concept of the gyroscopic couple on the stability of aeroplanes and automobiles.	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
28					CO6	Ability to understand the fundamentals of vibration and Noise	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
29	SEM V	070125513 - PR	TE7386	Production Management Lab	CO1	Explain the importance of forecasting and demonstrate the ability to apply some mathematical forecasting techniques.	-	-	-	-	-	-	-	Weak-L	-	Strong-H	-	Moderate-M	-	-

29					CO2	Importance of demand incapacity planning and aggregate planning, their techniques and utilization in the industry.	Moderate-M	-	-	Strong-H	-	-	-	Moderate-M	Moderate-M	Moderate-M	-	Moderate-M	-	-
29					CO3	Illustrate the different concepts of production planning and control (PPC) and define the functions of PPC.	Moderate-M	Moderate-M	-	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	-	-	Weak-L	-
29					CO4	Understand and develop plant layout	Moderate-M	Moderate-M	-	-	-	-	-	Weak-L	Moderate-M	Weak-L	-	Weak-L	-	-
29					CO5	Understand and implement the concepts of work-study and time study	Strong-H	-	-	-	-	-	-	Weak-L	Moderate-M	Moderate-M	-	Weak-L	-	-
30	SEM V	070125514 - PP	TE7366	Engineering Design Optimization	CO1	Understand the importance of optimization techniques in engineering.	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	Strong-H	-	-
30					CO2	Apply basic concept of mathematics to formulate the optimization problems.	Moderate-M	-	-	-	Moderate-M	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-
30					CO3	Select and apply appropriate classical optimization methods for one-dimensional and multi- dimensional problems.	Moderate-M	Strong-H	-	Strong-H	-	Strong-H	Moderate-M	Strong-H	-	-	-	Moderate-M	-	-
30					CO4	Construct and solve constraint optimization problems.	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	-	Moderate-M	-	-	-	-	Moderate-M	-	-
30					CO5	Apply optimization techniques to various engineering applications.	Weak-L	Weak-L	Moderate-M	Weak-L	Strong-H	Strong-H	Weak-L	Strong-H	Weak-L	-	Strong-H	Strong-H	-	-
31	SEM V	070125516 - PP	TE7359	Composite Materials	CO1	Identify and explain the types of composite materials and their characteristic features	Weak-L	-	-	Strong-H	-	-	-	Strong-H	-	-	-	-	-	-
31					CO2	Understand the differences in the strengthening mechanism of composite and its corresponding effect on performance and application	Moderate-M	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
31					CO3	Understand and explain the methods employed in composite fabrication	Weak-L	-	-	Strong-H	-	-	-	-	-	-	-	-	-	-
31					CO4	Appreciate the theoretical basis of the experimental techniques utilized for failure mode of composites	Moderate-M	Moderate-M	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	Strong-H	-	-
31					CO5	Equip them with knowledge on how to fabricate and carry out standard mechanical test on composites	Moderate-M	-	-	-	Moderate-M	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-
32	SEM V	070125517 - PP	TE7389	Basics of Automotive Engineering (honors)	CO1	Understand and apply knowledge of automotive engineering to the day today automotive applications.	Strong-H	Weak-L	-	Weak-L	Moderate-M	Moderate-M	Weak-L	Weak-L	Weak-L	Strong-H	-	Weak-L	-	-
32					CO2	Develop an ability to resolve the problems of automotive system and able to reach valid conclusion.	Moderate-M	Weak-L	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
32					CO3	Understand and examine the components and functions of vehicle chassis system.	Strong-H	Weak-L	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
32					CO4	Understand and apply knowledge of basic principles of electronics and electrical engineering to electric vehicles.	Strong-H	Weak-L	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
33	SEM V	070125518 - PP	TE7364	Automotive Electronics and Instrumentation(honors)	CO1	To understand of various instrumentation and control detection circuits as they relate to temperature, pressure, flow, and level monitoring of various processes.	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
33					CO2	Introduce various data acquisition systems, and converters relevant to instrumentation and its applications	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
33					CO3	Learn professional measurement techniques used to engineer thermal and mechanical systems	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
33					CO4	Understand data acquisition systems and their components including A/D converters and their characteristics and limitations.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
33					CO5	Understand the fundamental elements of instrumentation, measurement and control systems.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
33					CO6	Observe various instruments for engineering applications, design and set a data acquisition system for mechanical application	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
34	SEM V	070125519 - PP	TE7382	Automotive Vehicle Dynamics and NVH Lab(honors)	CO1	Understand and apply various sketching commands to make a 2D sketch by using sketch module in CAD software.	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	-	Moderate-M	-	-	-	-	Moderate-M	-	-

34					CO2	Understand and apply various basic commands like extrude, hole, chamfer, revolve etc. to make a 3D drawing using part module of CAD software.	Weak-L	Weak-L	Moderate-M	Weak-L	Strong-H	Strong-H	Weak-L	Strong-H	Weak-L	-	Strong-H	Strong-H	-	-
34					CO3	Prepare Front, top and side view of a 3D model (with dimensions) using drafting (drawing) module of CAD software.	Strong-H	Weak-L	-	Weak-L	Moderate-M	Moderate-M	Weak-L	Weak-L	Weak-L	Strong-H	-	Weak-L	-	-
34					CO4	Prepare assembly of mechanical components using assembly module of CAD software.	Moderate-M	Weak-L	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
34					CO5	Understand various basic parts of and operations done on CNC machine.	Strong-H	Weak-L	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
34					CO6	Carry out evaluation of sound absorption	Moderate-M	-	-	-	Moderate-M	Weak-L	Weak-L	Moderate-M	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-
34					CO7	Understand vibrating systems and modal analysis	Moderate-M	Strong-H	-	Strong-H	-	Strong-H	Moderate-M	Strong-H	-	-	-	Moderate-M	-	-
35	SEM V	070125520 - PP		Basic and Advanced CATIA Lab (honors)	CO1	Understand and apply various sketching commands to make a 2D sketch by using the sketch module in CAD software.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35					CO2	Understand and apply various basic commands like extrude, hole, chamfer, revolve etc. to make a 3D drawing using the part module of CAD software.	-	-	-	-	-	Strong-H	-	-	-	-	-	-	-	-
35					CO3	Prepare Front, top and side view of a 3D model (with dimensions) using drafting (drawing) module of CAD software.	-	Strong-H	-	Moderate-M	-	Moderate-M	-	-	-	-	-	-	-	-
35					CO4	Prepare assembly of mechanical components using assembly module of CAD software.	-	-	Moderate-M	-	Moderate-M	-	Strong-H	-	-	-	-	-	-	-
35					CO5	Understand various basic parts of and operations done on CNC machines.	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
36	SEM V	070125521 - PP	TE7380	Manufacturing Engineering(honors)	CO1	Student will learn about various sensors and actuators.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
36					CO2	Student will experiment and study the characteristics of strain gauge, bio-sensor, and temperature sensors. Student will learn about sensors and be able to use the right sensor for the future IoT projects.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
36					CO3	Student will learn about Arduino Programming and simulate the actuator control through Tinker CAD & Arduino module.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
36					CO4	Student will learn about basics of Rasberry Pi.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
36					CO5	Student will be able to create the prototype using sensors, Arduino & Tinker CAD.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
36					CO6	Design and analyze the machine component for Non-linear analysis	Moderate-M	Moderate-M	-	-	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H
37	SEM V	070125522 - PP	TE7664	Structural Non Linear and 3D Analysis Lab(honors)	CO1	Design and analyze 3D problems using commercial software	Strong-H	Strong-H	Moderate-M	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
37					CO2	Analyze different types of non- linearities	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
37					CO3	Elaborate problems using geometric nonlinearities.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
37					CO4	Explain problems using material nonlinearities.	Strong-H	Strong-H	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
37					CO5	Analyze problems using contact nonlinearities.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Strong-H	-	-	-	-	-	-	-	-
37					CO6	Design and analyze the machine component for Non-linear analysis	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
38	SEM V	070125526 - PP	F7031	Digital Manufacturing(honors)	CO1	Understand the concept of Digital Manufacturing.	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M	-	-	Strong-H	-	-	-	-	-	-
38					CO2	Learn the basics of CAD Modelling.	Moderate-M	Strong-H	Moderate-M	Moderate-M	-	-	-	Strong-H	-	-	-	-	-	-
38					CO3	Explain the concept of reverse engineering.	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-
38					CO4	Explain the concept of computer aided manufacturing and its related technologies.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-
39	SEM V	070125527 - PP	TE7673	Sensors and Actuators Lab(honors)	CO1	The student will learn about various sensors and actuators.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-

39					CO2	The student will experiment and study the characteristics of a strain gauge, bio- sensor, and temperature sensors. The student will learn about sensors and be able to use the right sensor for future IoT projects.	Strong-H	Moderate-M	Strong-H	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-
39					CO3	The student will learn about Arduino Programming and simulate the actuator control through Tinker CAD & Arduino module.	Moderate-M	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
39					CO4	The student will learn about the basics of Rasberry Pi.	Strong-H	Moderate-M	Moderate-M	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
39					CO5	The student will be able to create the prototype using sensors, Arduino & Tinker CAD.	Strong-H	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
40	SEM V	070125528 - PP	TE7668	Modern Sensors and Actuators (honors)	CO1	Select the right sensor for a given application.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
40					CO2	Design basic circuit building blocks.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
40					CO3	Simulate, synthesize, and layout a complete sensor or sensor system, MEMS device or microsystem ready for fabrication tools	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	SEM III	0701250301 - PP	TE7170	Engineering Mathematics-III	CO1	Use Cauchy's residue theorem, Cauchy's integral theorem and Cauchy's integral formula to evaluate contour integrals.	Strong-H	Weak-L	-	-	-	-	-	-	Strong-H	-	-	Moderate-M	-	-
41					CO2	Represent the given function in Fourier integral representation, find Fourier transforms and inverse Fourier transforms.	Strong-H	Moderate-M	-	-	-	-	-	-	Strong-H	-	-	Moderate-M	-	-
41					CO3	Apply Z-transform to solve difference equations.	Strong-H	Moderate-M	-	-	-	-	-	-	Strong-H	-	-	Moderate-M	-	-
41					CO4	Describe the nature of partial differential equations and solve partial differential equations.	Strong-H	Strong-H	-	-	-	-	-	-	Strong-H	-	-	Moderate-M	-	-
42	SEM III	0701250302 - PP	TE7390	Strength of Materials	CO1	Understand and apply knowledge of stresses & strains to various materials in engineering.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
42					CO2	Develop an ability to resolve the forces applied on the system and able to draw Shear Force and Bending Moment Diagram.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
42					CO3	Identify the intensity of bending stress and shear stress induced in various section of beam (i.e. I, C, T L, H sections, etc.)	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
42					CO4	Examine the intensity of torsional stress when the solid or hollow shaft is subjected to torsional moment.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
42					CO5	Understand and apply knowledge of principal stress, principal strain and Theories of Failure.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
42					CO6	Identify the slope and deflection of determinate beams and determine the radius of curvature and flexural rigidity.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
43	SEM III	0701250303 - Lab	T7652	Strength of Materials Lab	CO1	Conduct a tensile test on mild steel and tor steel specimens to determine the yield strength, ultimate strength, young's modulus of elasticity, percentage elongation, the percentage reduction in area.	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
43					CO2	Conduct a compression test on wood to determine the yield strength, ultimate strength, young modulus of elasticity, percentage deformation.	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-
43					CO3	Conduct and measure the hardness value of different material specimens using Rockwell, Brinell and Vicker hardness tester.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
43					CO4	Study the behavior of the wooden specimen under bending and to determine elastic strength, moment of resistance, modulus of elasticity, modulus of rupture.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
43					CO5	Determine toughness of material that is ability of material to absorb energy during plastic deformation by conducting Izod impact test in the laboratory.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
43					CO6	Measure the effect of single and double shear on riveted and welded plates using shear fixture on UTM.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
43					CO7	Measure the twisting capacity of steel rods using digital torsion testing machine.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-

44	SEM III	0701250304 - PP	TE7367	Engineering Materials and Metallurgy	CO1	Students will be able to identify binary alloy systems, interpret phase diagrams and judge the effect of alloying elements on properties of steel.	Strong-H	Moderate-M	-	Weak-L	-	-	-	-	-	-	-	-	Strong-H	-
44					CO2	Students will be able to identify suitable heat treatment method for material property modifications of metals and alloys.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	-
44					CO3	Students will be able to analyze and categorize the properties and applications of ferrous, non-ferrous and advanced engineering materials.	Strong-H	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	-	Strong-H	-
44					CO4	Will be able to identify basic material characterization techniques.	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
44					CO5	Understand and select solid state processing techniques such as powder metallurgy and its applications.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	Strong-H	Weak-L
45	SEM III	0701250305 - PP	T7635	Measurement and Metrology	CO1	Understand basic concepts of metrology, measurement system, characteristics of measuring instruments, sources of error in measurement standards, calibration of measuring instruments, sensors and transducers and its application.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
45					CO2	Understand various linear measuring devices, angular measuring devices, geometric tolerances, limit gauges, design of limit gauges and comparators.	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-
45					CO3	Understand and apply concepts of surface metrology,gear metrology, screw thread metrology, CMM and interferometers	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
45					CO4	Understand construction and working of different pressure, temperature and flow measuring devices.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
45					CO5	Understand construction and working of different level, speed and sound measuring devices.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
45					CO6	Understand construction and working of strain gauges and itsapplication in the measurement of force, torque, vibration and acceleration.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46	SEM III	0701250306 - Lab	T7636	Measurement and Metrology Lab	CO1	Understand application of different linear and angular measuring devices.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO2	Understand application ofslip gauges, limit gauges and comparators.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO3	Understand application offloating carriage micrometer and gear tooth vernier caliper to measure screw thread and gear tooth parameters respectively.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO4	Understand application ofoptical flat, optical projector / toolmaker microscope.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO5	Study of CMM and its applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO6	Study of different pressure measuring instruments and its applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO7	Study of different temperature measuring instruments and its applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO8	Study of different flow / level measuring instruments and its applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO9	Study of different speed / strain measuring instruments and its applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
46					CO10	Understand applications of measuring instruments in the industries.	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
47	SEM III	0701250307 - PP	TE7368	Engineering Thermodynamics	CO1	Understand and apply the thermodynamic fundamentals to various thermodynamic processes	Moderate-M	Weak-L	-	-	-	-	-	-	Strong-H	Weak-L	-	Weak-L	Weak-L	-
47					CO2	Identify general equation for entropy and apply it to basic thermodynamic system like engine, refrigerator, etc.	Weak-L	-	-	-	-	-	-	-	Weak-L	Weak-L	-	Weak-L	Weak-L	-
47					CO3	Understand and explain application of air standard cycle like, I.C. Engine.	Weak-L	-	-	-	-	-	-	Weak-L	Weak-L	-	-	Weak-L	-	-

47					CO4	Identify various steam properties and its thermodynamics relations.	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-	Moderate-M	-	-
48	SEM III	0701250308 - Lab	T7940	Engineering Thermodynamics Lab	CO1	Understand and apply the thermodynamic fundamentals to various thermodynamic processes	Moderate-M	Weak-L	-	-	-	-	-	-	Strong-H	Weak-L	-	Weak-L	Weak-L	-
48					CO2	Identify general equation for entropy and apply it to basic thermodynamic system like engine, refrigerator, etc.	Weak-L	-	-	-	-	-	-	-	Weak-L	Weak-L	-	Weak-L	Weak-L	-
48					CO3	Understand and explain application of air standard cycle like, I.C. Engine.	Weak-L	-	-	-	-	-	-	Weak-L	Weak-L	-	-	Weak-L	-	-
48					CO4	Identify various steam properties and its thermodynamics relations.	Weak-L	-	-	-	-	-	-	-	Moderate-M	-	-	Moderate-M	-	-
49	SEM III	0701250309 - PP	TE7370	Fluid Mechanics	CO1	Solve the various fluid static as well as kinematics problems appearing in the practical life.	Strong-H	Strong-H	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
49					CO2	Develop conservation laws for various to fluid flow problems.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
49					CO3	Develop non-dimensional analysis using Buckingham pi theorem and/or scale laws for various fluid flow problems	Strong-H	Strong-H	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
49					CO4	Analyze and evaluate various types of flows, related fluid losses appearing in flow through pipes.	Strong-H	Strong-H	-	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-
49					CO5	Discover and evaluate the various fluid forces by applying the concept of boundary layer over basic geometries appearing in practical life and/or fluid applications	Strong-H	Strong-H	-	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-
49					CO6	Build the fundamentals concepts required for compressible fluid flows and relevant systems	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
50	SEM III	0701250310 - Lab	T7615	Fluid Mechanics Lab	CO1	Describe the losses occurring when flow takes place through pipes with different materials, velocities and roughness values	Strong-H	Strong-H	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
50					CO2	Demonstrate an understanding of the ship stability by deciding its metacentric height.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
50					CO3	State the effect of Reynolds number on the flow phenomena in closed conduits	Strong-H	Strong-H	-	-	Moderate-M	-	-	-	-	-	-	-	-	-
50					CO4	Undertake calibration of flow measuring devices like orifice plate and venturimeter and study their performance	Strong-H	Strong-H	-	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-
50					CO5	Perform systematic experiments to understand/verify Bernoulli's theorem	Strong-H	Strong-H	-	-	-	-	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-
50					CO6	Demonstrate an understanding of the electrical analogy method for applications involving flow/velocity determinations in a fluid flow situation	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
51	SEM III	0701250313 - PP	T6184	Basic German I	CO1	Basic greetings and introducing yourself in German	-	-	-	-	-	Moderate-M	-	-	-	Strong-H	-	-	-	-
51					CO2	Numbers, nationalities, languages, professions in German	-	-	-	-	-	Moderate-M	-	-	-	Strong-H	-	-	-	-
51					CO3	Talking about freetime activities, likings, Family members	-	-	-	-	-	Moderate-M	-	-	-	Strong-H	-	-	-	-
51					CO4	To be able to tell time, daily routine, classroom objects	-	-	-	-	-	Moderate-M	-	-	-	Strong-H	-	-	-	-
52	SEM III	0701250315 - PP	T6188	Basic Spanish I	CO1	Distinguish between the different approaches needed to manage pre- during and post- disaster periods	-	-	-	-	-	-	Moderate-M	Weak-L	Moderate-M	Weak-L	-	-	-	-
52					CO2	Understand the process of risk / Emergency/Disaster Management Cycle	Weak-L	-	-	-	-	-	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-
52					CO3	Affirm the usefulness of integrating management principles in disaster mitigation work	-	-	-	-	-	-	-	Weak-L	Weak-L	Weak-L	-	-	-	-
52					CO4	Develop an understanding of the key concepts, definitions a key perspectives of All Hazards Emergency Management .	-	-	-	-	-	-	Weak-L	Weak-L	Strong-H	Weak-L	-	-	-	-
52					CO5	Develop a basic under understanding of Prevention, Mitigation, Preparedness, Response and Recovery	-	-	-	-	-	-	Moderate-M	Weak-L	Moderate-M	Weak-L	-	-	-	-
53	SEM I	0701250101 - PP	TE7168	Engineering Mathematics -I	CO1	Apply successive differentiation to find nth derivative, indeterminate forms and series expansion of functions.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-

53					CO2	Apply the concepts of partial differentiations to solve problems on homogeneous functions, Jacobians and maxima & minima.	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-
53					CO3	Evaluate integrals using reduction formulae and improper integral using DUIS rule and beta-gamma function, Evaluate length, surface area and volume of revolution.	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
53					CO4	Test the convergence of series of positive terms, alternating series and power series by using appropriate tests, Express the function in the form of a Fourier series.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
53					CO5	Evaluate rank of a matrix, Solve system of simultaneous equation.	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
53					CO6	Find Eigen values and Eigen vectors, Transform a matrix to diagonal form and apply Caley- Hamilton theorem to find inverse and higher powers of a matrix.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-
54	SEM I	0701250102 - PP	T7381	Chemistry	CO1	understand different terms and numericals related to water treatment, and apply different techniques for the same	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54					CO2	understand the basic concept in polymer chemistry and describe types, mechanism and properties of polymers and composites	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54					CO3	apply the concepts related to various spectroscopic analysis techniques	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54					CO4	understand the basic concepts related to Green chemistry, environmental chemistry and non-conventional energy sources	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54					CO5	describe the concepts related to fuel chemistry, solve numerical problems and understand the basic concepts in Energy science and Nanomaterials	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	SEM I	0701250103 - PR	T7382	Chemistry Lab	CO1	examine water samples for different parameters through experimentation	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
55					CO2	understand the preparation of condensation polymers and finding molecular weight of polymer	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
55					CO3	apply basic concepts in spectroscopic analysis	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
55					CO4	evaluate the practical utility of fuel samples and understand the parameters related to environmental pollution (water pollution)	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
55					CO5	write effectively the results of experimentation and develop team working skills	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
56	SEM I	0701250104 - PP	T7540	Basic Electrical and Electronics Engineering	CO1	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical approaches for solving a given electric circuit.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
56					CO2	Develop a clear understanding and acquire the knowledge of basic principles, working and applications of DC machines and single phase transformer.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
56					CO3	Understand basics of semiconductor physics, diode, Zener Diode and BJTs, their different configurations and applications.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
56					CO4	Develop a clear understanding of digital circuits like half adder, full adder and logic gates.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	Strong-H
57	SEM I	0701250105 - PR	T7593	Basic Electrical and Electronics Engineering Lab	CO1	Understand the need of various safety precautions to be undertaken while working with electrical equipment and learn different wiring components and wiring schemes.	Moderate-M	Weak-L	-	-	Strong-H	-	-	-	-	Weak-L	-	Weak-L	-	Weak-L
57					CO2	Apply the knowledge of relevant laws and principles and familiarize with different theorems and analytical approaches for solving a given electric circuit.	Strong-H	Strong-H	-	-	Strong-H	-	-	-	-	Weak-L	-	Weak-L	-	Weak-L

57					CO3	Develop a clear understanding of the characteristics of basic semiconductor devices like, pn junction diode, Zener Diode and BJTs, their different configurations and applications.	Strong-H	Strong-H	-	-	Strong-H	-	-	-	-	Weak-L	-	Weak-L	-	Weak-L
57					CO4	Use and understand different controls of equipment like CRO and DMM.	Moderate-M	Moderate-M	-	-	Strong-H	-	-	-	-	Weak-L	-	Weak-L	-	Weak-L
58	SEM I	0701250106 - PR	T7925	Engineering Graphics Lab	CO1	Understand and draw projections of points (0D) located in four quadrants	-	-	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
58					CO2	Visualize, plan and draw projections of lines (1D) and planes (2D) (inclined to both planes of projection)	-	Moderate-M	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-
58					CO3	Visualize and draw projections of regular solids (3D) (inclined to both planes of projection) and sections of regular solids (front view, top view and true shape)	-	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
58					CO4	Visualize and communicate 3D regular/irregular shapes as 2D engineering drawings and vice versa using orthographic/isometric/development principles	-	Moderate-M	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-
59	SEM I	0701250107 - PP	TE7286	Programming and Problem Solving	CO1	Introduce the various concepts of computational thinking, modern computer systems, python IDE, problem formulation, devising a solution and its evaluation	Strong-H	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	Weak-L	-	-
59					CO2	Get acquainted to python programming basics by learning and practicing the coding	Weak-L	Moderate-M	Strong-H	Weak-L	Moderate-M	-	-	-	-	-	-	Weak-L	-	-
59					CO3	Evaluation and analyzing using functions and modules to simplify and automate the programming	Weak-L	Moderate-M	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
59					CO4	Using classes to create representations of real world objects and simulate them in IDE	Weak-L	-	Strong-H	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-
60	SEM I	0701250108 - PR	TE7287	Programming and Problem Solving Lab	CO1	Using the concepts learnt in the class to create different models for problem understanding	Weak-L	Moderate-M	Strong-H	Weak-L	Moderate-M	-	-	-	Weak-L	-	-	Weak-L	-	-
60					CO2	Python programming to convert algorithms to solve simple mathematical problems	Weak-L	Moderate-M	Strong-H	-	Moderate-M	-	-	-	Weak-L	-	-	-	-	-
60					CO3	Developing quantitative aptitude using python programming to solve complex real life problems	Weak-L	Moderate-M	Moderate-M	Strong-H	Moderate-M	Weak-L	-	-	Weak-L	-	-	-	-	-
60					CO4	Teaching ethics, team work by designing and creating a comprehensive socially relevant system	Moderate-M	Moderate-M	Strong-H	Weak-L	Moderate-M	-	-	Weak-L	Weak-L	Weak-L	Weak-L	-	-	-
61	SEM I	0701250109 - PP	T6732	Critical Thinking	CO1	Make better decisions based on logical thinking,	-	Weak-L	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-
61					CO2	Identify and evaluate facts in an argument,	-	Weak-L	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
61					CO3	Derive truth, ambiguity, vagueness and fallacy in arguments,	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
61					CO4	Design questions to reach conclusions.	-	Moderate-M	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
62	SEM I	0701250110 - PP	TE7188	Environmental Science	CO1	Understand about sustainable technologies for resource conservation and about sustainable technologies for resource conservation	Moderate-M	-	-	-	-	-	Moderate-M	-	-	-	-	-	-	-
62					CO2	Identify sources, effects and remedial measures for different pollutions	Moderate-M	-	-	-	-	-	-	-	-	Moderate-M	-	-	-	-
62					CO3	Identify and formalize a generalized water and wastewater treatment process	-	-	Moderate-M	-	Moderate-M	-	-	-	-	-	-	-	-	-
62					CO4	Identify various sources of solid wastes, their effects and latest management techniques	-	-	-	-	-	Moderate-M	-	Moderate-M	-	-	-	-	-	-
62					CO5	Know about existing environmental laws and legislations and related case studies.	-	-	-	-	-	Moderate-M	-	-	-	-	-	-	-	-
63	SEM VI	070125601 - PP	TE7357	CAD & CAM	CO1	Acquire fundamental understanding about the product cycle using CAD/CAM and the role of hardware and software in this process.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
63					CO2	CO2: Understand mathematical representation of curves and surfaces and their application	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-

63					CO3	CO3: Understand various geometric modeling representations and to apply engineering mathematics (related to matrices) to understand transformation systems	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
63					CO4	CO4: Understand and apply computer aided manufacturing principles to perform NC programming	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
63					CO5	CO5: Understand integrated manufacturing, robotics , flexible manufacturing systems and group technology to realize use of computers in manufacturing industry	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
64	SEM VI	070125603 - PP	TE7291	Project Based Learning- II	CO1	Build a small group and develop skills specific to collaborative efforts, solve more complex problems than they could on their own, delegate roles and responsibilities.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64					CO2	Develop a practice to share diverse perspectives, pool knowledge and skills, hold one another (and be held) accountable.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64					CO3	Learn how to solve problems that are important to them, including real life issues using their prior knowledge and learn effectively how to learn new concepts, processes for solution of the problem—even learning from failure and possibly starting over.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64					CO4	Apply creative thinking skills to innovate new ideas and possibilities solution of the problem.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	SEM VI	070125606 - PR	T7607	CAD& CAM Lab	CO1	Understand and apply various sketching commands to make a 2D sketch by using sketch module in CAD software.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
65					CO2	Understand and apply various basic commands like extrude, hole, chamfer, revolve etc. to make a 3D drawing using part module of CAD software.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
65					CO3	Prepare Front, top and side view of a 3D model (with dimensions) using drafting (drawing) module of CAD software.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
65					CO4	Prepare assembly of mechanical components using assembly module of CAD software.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
65					CO5	Understand 2 D CAM programming and CNC lathe and VMC operations.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
66	SEM VI	070125607 - PP	TE7369	Finite Element Methods	CO1	Develop the ability to generate the governing (differential equations) equations for mechanical systems and implement the basic finite elements procedures for structural and thermal applications using truss and beam elements.	Strong-H	Strong-H	Weak-L	-	Moderate-M	-	-	-	-	-	-	-	-	-
66					CO2	Identify and apply the mathematical tools from algebra, calculus and numerical methods for the solution of one dimensional finite element problems.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
66					CO3	Determine the engineering design concepts required to numerically analyze the stresses, strains and deformation of a structure under either plane-stress or plane-strain conditions.	Strong-H	Strong-H	Weak-L	-	Moderate-M	-	-	-	-	-	-	-	-	-
66					CO4	Investigate and model numerically the multi-dimensional structural and heat transfer problems using Finite Element Method (FEM). Also use CAD/CAE software to solve the proposed models.	Strong-H	Strong-H	Strong-H	-	Moderate-M	-	-	-	-	-	-	-	-	-
66					CO5	Apply knowledge and skills from mechanics and numerical methods to effectively evaluate dynamic problems.	Strong-H	Strong-H	Strong-H	-	Weak-L	-	-	-	-	-	-	-	-	-
66					CO6	Understand Time-dependent analysis	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-
67	SEM VI	070125608 - PP	TE7360	Computational Fluid Dynamics	CO1	Develop basic governing equations for fluid and heat flow by examining the various physical boundary conditions.	Strong-H	Moderate-M	Moderate-M	-	Strong-H	-	Moderate-M	-	Weak-L	-	-	-	-	-
67					CO2	Construct finite difference based equations according to the nature (i.e. elliptic, parabolic and hyperbolic) of the flow problem.	Moderate-M	Strong-H	Moderate-M	-	Weak-L	-	Strong-H	-	Weak-L	-	-	-	-	-

67					CO3	Decide and implement various implicit and explicit CFD schemes to solve steady and unsteady 1/2/3 dimensional fluid problems.	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
67					CO4	Analyze and evaluate various finite volume based CFD schemes to solve convection-diffusion problems.	Moderate-M	Strong-H	Strong-H	-	Moderate-M	-	Strong-H	-	Weak-L	-	-	-	-	-
67					CO5	Solve incompressible flow problems with considerations of geometry, mesh, flow physics, physical boundary conditions, turbulence, etc.	Moderate-M	Strong-H	Moderate-M	-	Weak-L	-	Strong-H	-	Moderate-M	-	-	-	-	-
68	SEM VI	070125609 - PP	TE7378	Jigs and Fixtures	CO1	Understand and differentiate between the applications of Jigs and Fixtures	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
68					CO2	Apply their knowledge in selection of proper work holding devices for manufacturing process	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
68					CO3	Design appropriate jigs and fixtures for different manufacturing operations	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
68					CO4	Understand metal cutting tools and identify various tool parameters	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
68					CO5	Apply the knowledge of fits and tolerances in design of jigs and fixtures.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
69	SEM VI	070125610 - PR	T7611	Finite Element Methods Lab	CO1	Design and analyze 1D structural problem using commercial software, and compare results with classical solutions.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69					CO2	Design and analyze beam problems using ANSYS, commercial software, and compare results with classical solutions.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69					CO3	Design and analyze 2D problems using ANSYS, commercial software, and compare results with classical solutions.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69					CO4	Prepare 3D model of a part and analyze it using ANSYS.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69					CO5	Formulate dynamic problem using ANSYS and evaluate modal frequencies.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	SEM VI	070125611 - PR	T7686	Computational Fluid Dynamic Lab	CO1	Discover as well as develop various mesh over the given 2 dimensional/3 Dimensional fluid domain.	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Strong-H	-	Strong-H	-	-	-	-	-
70					CO2	Interpret and analyze the viscous flow through pipe at various Reynolds's number.	Moderate-M	Strong-H	Moderate-M	-	Weak-L	-	Strong-H	-	Moderate-M	-	-	-	-	-
70					CO3	Interpret and analyze the various turbulent flow by using corresponding turbulent flow models for flat plate geometrical conditions.	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Strong-H	-	-	-	-	-	-	-
70					CO4	Interpret and analyze the steady as well as unsteady flow over the bluff body.	Strong-H	Moderate-M	Strong-H	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
70					CO5	Interpret and analyze the flow involving heat transfer scenario.	Strong-H	Moderate-M	Moderate-M	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
70					CO6	Analyze the compressible flow for basic geometrical domain.	Strong-H	Moderate-M	Strong-H	-	Strong-H	-	Moderate-M	-	-	-	-	-	-	-
70					CO7	Build the software code for wave equation.	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
70					CO8	Build the software code to solve 1D/2D i) diffusion ii) convection- diffusion problem.	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Moderate-M	-	Strong-H	-	-	-	-	-
71	SEM VI	070125612 - PR	TE7063	Jigs and Fixtures Lab	CO1	Design and Draw different clamps and work holding devices for manufacturing process	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
71					CO2	Design and Draw different jigs for different manufacturing operations	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
71					CO3	Design and Draw different Fixtures for different manufacturing operations	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
71					CO4	Apply the knowledge of fits and tolerances in design of jigs and fixtures	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
72	SEM VI	070125614 - PP	TE7385	Power Plant Engineering	CO1	Classify and compare Steam, gas, Diesel and Hydro power plants, nuclear Power plants. Explain construction, and working of power plants. Explain siting considerations of power plants Compare various types of nuclear reactors and explain site selection for reactor and waste disposal of the reactor	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-

72					CO2	Classify various types of fuels used in thermal power plant and explain their handling, combustion etc. Explain ash handling and dust collection mechanism, principle of fluidized bed combustion, High Pressure boilers	Strong-H	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
72					CO3	Explain principle of Steam nozzles, variation of velocity and pressure, choking of nozzle, nozzle efficiency etc., Classify various types of nozzles and diffusers Explain effect of friction, velocity coefficient, examine nozzle efficiency. Explain supersaturated flow.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
72					CO4	Classify different types of condensers and explain Dalton's law of partial pressure, condenser efficiency, condenser vacuum and vacuum efficiency, etc. Illustrate construction of various types of condensers and explain their functioning etc. Analyze effect of air on condenser efficiency.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
72					CO5	Compare different type of Steam turbines and explain their constructional details, losses, overall efficiency, etc. Analyze performance of steam turbines.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
72					CO6	Explain and analyze various economic factors associated with power generation like unit energy cost, load factor, plant capacity factor etc. Explain load curves and compare performance of different capacity power plants.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
73	SEM VI	070125615 - PP	T7644	Operations Research	CO1	Formulate complex mathematical models from the verbal description of the real system in management science and industrial engineering using correct decision variables.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
73					CO2	Identify and apply the mathematical tools from algebra and calculus for the solution methods for linear programming, transportation and assignment models. Also use mathematical software to solve the proposed models.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
73					CO3	Explain the dynamic programming structure and applications of dynamic programming	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
73					CO4	Compare the various replacement / inventory models and choose the best alternative with minimum maintenance cost/ inventory costs.	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
73					CO5	Evaluate and review the network, determine the critical path and estimate the cost of the project.	Strong-H	Strong-H	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-
73					CO6	Develop proficiency with tools from probability, statistics and simulation, and apply them to the queuing situations in the service industry to minimize the customers / clients waiting period for service delivery.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	SEM VI	070125618 - PP	TE7339	Renewable Energy Systems	CO1	Acquire knowledge on energy demand and renewable energy sources	Strong-H	-	-	-	-	Weak-L	Weak-L	Weak-L	-	-	-	Moderate-M	-	Weak-L
74					CO2	Define the working principle of solar photovoltaics energy	Strong-H	Weak-L	Weak-L	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	-	Strong-H
74					CO3	Define the working principle of wind energy	Strong-H	Weak-L	Weak-L	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	-	Strong-H
74					CO4	Describe biomass technology to generate electricity	Strong-H	Weak-L	Weak-L	-	-	Weak-L	Weak-L	Weak-L	-	-	-	Moderate-M	-	Moderate-M
74					CO5	Define fuel cells, geothermal energy, ocean energy and tidal energy	Strong-H	-	-	-	-	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Weak-L	Strong-H	-	Moderate-M
75	SEM VI	070125622 - PP	T7499	Java	CO1	Implement Object Oriented programming concepts in java and comprehend fundamentals of object-oriented programming including defining classes, objects, inheritance, etc.	Strong-H	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-
75					CO2	Demonstrate reusability in Java through interfaces, packages and inheritance.	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-
75					CO3	Demonstrate the concept of exception handling.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
75					CO4	Summarize the concept of event handling in AWT and Swings and develop GUI applications in java.	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-

75					CO5	Demonstrate the usage of an applet in Java.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
76	SEM VI	070125624 - PP	TE7263	Introduction to AI and Machine Learning	CO1	Explain definition, goals and applications of Artificial Intelligence (AI) with examples	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO2	Illustrate various properties of Internal Representation in AI	Strong-H	Weak-L	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO3	Evaluate solving problems in AI by various search techniques.	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO4	Illustrate various knowledge representations using predicate and non-monotonic logic of AI	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO5	Analyze and apply various AI techniques to real world applications	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO6	Apply Natural Language Processing (NLP) techniques in various AI applications	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO7	Outline and organize architecture of Expert System and implement related case studies	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
76					CO8	Illustrate various learning techniques including incremental learning, deep learning and machine learning	Moderate-M	Moderate-M	Moderate-M	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-
77	SEM VI	070125627 - PP	TE7351	3D Printing and Prototyping	CO1	Understand what Advanced/Additive manufacturing (AM) is and understand important technology trends for product development and innovation.	Weak-L	Moderate-M	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
77					CO2	Exhibit comprehensive knowledge of the broad range of AM processes, devices, capabilities and materials that are available.	Moderate-M	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
77					CO3	Understand the various software's, processes and techniques that enable advanced/additive manufacturing and peculiar fabrication.	Strong-H	Weak-L	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
77					CO4	Learn how to make physical objects that fulfil product development/prototyping requirements, using advanced/additive manufacturing devices and processes.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-
78	SEM VI	070125628 - PP	T2618	Project Management	CO1	Analyze various facets of a project and its management.	Strong-H	Moderate-M	Strong-H	-	-	Moderate-M	-	-	Moderate-M	-	-	-	-	-
78					CO2	Develop project plan using appropriate technique like Gantt chart, CPM & PERT.	Moderate-M	Strong-H	-	Moderate-M	-	-	Moderate-M	-	Strong-H	-	-	-	-	-
78					CO3	Understand human resource management in projects from both client and server point of views.	Moderate-M	Strong-H	Moderate-M	-	Moderate-M	-	Weak-L	-	Strong-H	-	-	-	-	-
78					CO4	Select method for effective material management, express ethical practices in project management and restate general and special conditions of contract document.	Strong-H	Moderate-M	Moderate-M	-	Strong-H	-	Moderate-M	-	Weak-L	-	-	-	-	-
78					CO5	Formulate budget, actual expenditures and profits in a project.	Moderate-M	Strong-H	Weak-L	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
79	SEM VI	070125634 - PP	T7394	Smart Materials	CO1	Describe the importance of smart materials on the basis of their applications	-	-	-	-	-	-	Weak-L	-	-	-	-	Moderate-M	-	-
79					CO2	Understand the structure, electrical and magnetic properties of materials	Strong-H	Strong-H	-	-	-	-	-	-	Weak-L	-	-	Moderate-M	-	-
79					CO3	Classify the smart materials in terms of their unique electric and magnetic properties	Strong-H	Strong-H	-	-	-	-	-	-	Weak-L	-	-	Moderate-M	-	-
79					CO4	Identify some special smart materials	-	-	Moderate-M	-	-	Moderate-M	-	-	Strong-H	-	-	Weak-L	-	-
79					CO5	Understand some important application of smart materials	-	-	-	-	-	Moderate-M	-	-	Moderate-M	-	-	Moderate-M	-	-
80	SEM VI	070125635 - PP	TE7171	Introduction to Mathematical Modelling	CO1	Understand the discrete-time linear models in population dynamics.	-	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-	-
80					CO2	Formulate and solve the discrete- time nonlinear models in population dynamics and prey-predator models.	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-
80					CO3	Formulate and solve the differential equations governing the continuous models.	-	Moderate-M	-	-	-	Strong-H	Strong-H	-	-	-	-	-	-	-
80					CO4	Analyse the qualitative solution of continuous models using phase diagrams.	-	Strong-H	Strong-H	-	-	-	Strong-H	-	-	-	-	-	-	Strong-H

81	SEM VI	070125646 - PP	TE7669	Hybrid Technology (Honours)	CO1	Explain the basics of working of Electric Vehicles, their architecture, technologies and fundamentals	Moderate-M	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
81					CO2	Explain the plug in the hybrid electric vehicle architecture, design and component sizing and the power electronics devices used in hybrid electric vehicles	Strong-H	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
81					CO3	Analyze various electric drives suitable for hybrid electric vehicles	Strong-H	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-
81					CO4	Discuss different energy storage technologies used for hybrid electric vehicles and their control	Strong-H	Moderate-M	Weak-L	Strong-H	-	-	-	-	-	-	-	-	-	-
81					CO5	understand the electric propulsion unit and its control for the application of electric vehicles	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
82	SEM VI	070125647 - PP	F0002	Flexi Credit Course (Auto Honours)	CO1	Understand commonly used hardware used for self-driving cars	Strong-H	Moderate-M	Weak-L	-	Strong-H	-	Strong-H	-	Moderate-M	-	-	-	-	-
82					CO2	Identify the main components of the self-driving software stack	Strong-H	Moderate-M	Weak-L	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
82					CO3	Program vehicle modelling and control	Strong-H	Moderate-M	Moderate-M	-	Strong-H	-	Moderate-M	-	Moderate-M	-	-	-	-	-
82					CO4	Analyze the safety frameworks and current industry practices for vehicle development	Strong-H	Moderate-M	Strong-H	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
83	SEM VI	070125648 - PP	TE7435	Automotive Engine and Transmission System (Honours)	CO1	Understand basic concept of engine and its working of SI and CI engines	Strong-H	-	-	Moderate-M	-	-	-	-	-	-	-	-	-	-
83					CO2	underline the importance of engine components, fuel supply, cooling and lubrication systems	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
83					CO3	Know the importance of air motion and combustion chamber design	Moderate-M	-	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
83					CO4	Evaluate and understand of new engine technology	Strong-H	-	-	Moderate-M	Strong-H	-	-	-	-	-	-	-	-	-
84	SEM VI	070125649 - PR	TE7362	Computer Aided Design II Lab (Honours)	CO1	Understand and apply various sketching commands to make a 2D sketch by using sketch module in the software.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
84					CO2	Understand and apply various basic commands like extrude, hole, chamfer, revolve etc. to make a 3D drawing using part module of CAD software.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
84					CO3	Visualize Front, top and side view of a 3D model (with dimensions) using the CAD software.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
84					CO4	Create and design innovative features for the mechanical components	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
84					CO5	Use SolidWorks to build parametric models of parts and assemblies.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
85	SEM VI	070125650 - PR	TE7670	Computer Aided Manufacturing Lab (Honours)	CO1	Identify the process and cutting tool selection for a particular application.	Moderate-M	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
85					CO2	Operate the CNC lathe and milling center	-	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
85					CO3	Program a tool path using G and M codes. Safely run it on a CNC machine	-	Weak-L	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-
85					CO4	Apply the application of CNC technology in other manufacturing fields	Weak-L	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
86	SEM VI	070125651 - PR	TE7582	Structural Dynamics and Non Linear Analysis Lab (Honours)	CO1	Design and analyze 3D problems using commercial software	Strong-H	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
86					CO2	Analyze different types of non- linearities	Strong-H	Moderate-M	Moderate-M	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
86					CO3	Elaborate problems using geometric nonlinearities.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
86					CO4	Explain problems using material nonlinearities.	Strong-H	Moderate-M	Strong-H	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-
86					CO5	Analyze problems using contact nonlinearities.	Strong-H	Moderate-M	Strong-H	Moderate-M	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
86					CO6	Design and analyze the machine component for Non-linear analysis	Strong-H	Moderate-M	Strong-H	Strong-H	Moderate-M	Strong-H	-	-	-	-	-	-	-	-
87	SEM VI	070125655 - PP	TE7672	AI and ML for Smart Manufacturing (Honours)	CO1	Explain the role of AI in smart manufacturing and Industry 4.0	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-

87					CO2	Understand the concept and importance of pre-processing stage while handling various types of data including industry and system data using the machine learning concepts	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
87					CO3	Read, understand and interpret supervised learning concepts, classification problems and techniques with example case studies	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
87					CO4	Interpret, understand the importance of regression analysis, and apply it to various use cases	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
87					CO5	Understand the need for unsupervised machine learning techniques and apply to various use cases	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
88	SEM VI	070125656 - PP	TE7374	Industrial Internet of Things (Honours)	CO1	Explain the concept of Industrial Internet of Things	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-
88					CO2	List out the key technological aspects of IIoT	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-
88					CO3	Identify the application areas of IioT and Industry 4.0 concepts.	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-
89	SEM VI	070125657 - PR	TE7573	Machine Learning and Artificial Intelligence Lab (Honours)	CO1	Explain the role of AI in smart manufacturing and Industry 4.0	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
89					CO2	Distinguish training , testing and validation set	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
89					CO3	Illustrate different types of classification techniques using case studies	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
89					CO4	Illustrate different types of regression techniques using case studies	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
89					CO5	Understand the need for unsupervised machine learning techniques and apply to various use cases	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
90	Sem II	0701250201 - PP	TE7169	Engineering Mathematics -II	CO1	Evaluate multiple integral in different coordinate system.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
90					CO2	Apply multiple integrals to find area, volume, centre of gravity and moment of inertia.	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
90					CO3	Identify and solve linear differential equations using suitable method and apply for solving problems from engineering.	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
90					CO4	Evaluate gradient, divergence, curl, directional derivatives and apply Green's theorem, Gauss divergence theorem and Stoke's theorem to evaluate vector integration.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
90					CO5	Evaluate Laplace transform of various functions, find inverse Laplace transforms and apply Laplace transform to evaluate definite integrals and and to solve linear differential equations	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
91	Sem II	0701250202 - PP	T7391	PHYSICS	CO1	Understand the origin and nature of electric field and electric lines of force and calculate the flux through various surfaces.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
91					CO2	Explain the electric properties of various materials.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
91					CO3	Understand the origin and nature of magnetic lines of force.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
91					CO4	Explain the behaviour of various materials in magnetic field and nature of magnetic media.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
91					CO5	Realize the importance of light phenomena in thin films, grating and telescope and understand their applications.	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-
92	Sem II	0701250203 - PR	T7392	PHYSICS LAB	CO1	To acquire ability to conduct, analyze and interpret experiments in Physics.	Strong-H	-	-	-	-	-	-	-	-	-	-	-	-	-
92					CO2	To demonstrate the required experimental skills of the given experiment.	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-	-
92					CO3	To analyze the given/ obtained data and interpret the result.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
92					CO4	To communicate ideas/knowledge via verbal/written means and demonstrate the understanding of concepts.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-

93	Sem II	0701250204 - PP	T7383	Communication Skills	CO1	CO1: Sketch their communicative knowledge for effective interpersonal and intercultural communication by identifying the barriers to effective communication in accordance with all types of communication; avoid or overcome them.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
93					CO2	CO2: Demonstrate linguistic competence and employ communication etiquettes through enhanced listening, speaking and reading skills.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
93					CO3	CO3: Modify, deliver effective presentations, interviews and develop articulation in group discussions.	-	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-
93					CO4	CO4: Constructing sentences effectively using grammar, punctuation and vocab with reference to effective formal business/corporate communication.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
93					CO5	CO5: Design impactful resumes, reports, notices, agendas, minutes, emails and business letters.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
94	Sem II	0701250205 - PR	T7384	Communication Skills Lab	CO1	Express ideas and concepts well through vocabulary building, LSRW aptitude tests, mind mapping and brain storming.	-	-	-	-	-	-	-	-	Weak-L	Moderate-M	-	-	-	-
94					CO2	Demonstrate linguistic competence- through accuracy in grammar, pronunciation and vocabulary.	-	-	-	-	-	-	-	-	Weak-L	Moderate-M	-	-	-	-
94					CO3	Sketch their creative side in formal as well as informal communication	-	-	-	-	-	-	-	-	Moderate-M	Strong-H	-	-	-	-
94					CO4	Employ etiquettes in oral and written communication.	-	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-
94					CO5	Modify their listening skills.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
94					CO6	Sketch their articulation while participating in Group discussions, debate or job interviews, presentations and extempore.	-	-	-	-	-	-	-	-	Moderate-M	Moderate-M	-	-	-	-
95	Sem II	0701250206 - PP	T7414	Engineering Mechanics	CO1	Determine the components of a force in rectangular or non- rectangular co-ordinate systems and obtain its resultants.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO2	Draw complete and correct free- body diagrams and write the appropriate equilibrium equations.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO3	Determine the centre of gravity and moment of inertia for various components.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO4	Determine the support reactions of structures and analyse the trusses.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO5	Recognize frictional forces acting on a body.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO6	Study the effect of rectilinear motion on body.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
95					CO7	Describe and apply basic dynamics concepts - the Work-Energy principle and Impulse-Momentum principle.	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
96	Sem II	0701250207 - PR	T7658	Workshop Practice	CO1	To be able to use basic fitting tools and perform basic fitting operations	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
96					CO2	To be able to use basic carpentry tools and perform basic carpentry operations	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
96					CO3	To be able to use basic sheet metal tools and perform basic sheet metal operations	Moderate-M	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
96					CO4	To be able to use basic welding tools and perform basic welding operations	Strong-H	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
96					CO5	To be able to write the working procedure of workshop practice jobs in technical language.	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-
97	Sem II	0701250208 - PR	TE7300	Tinker Lab	CO1	To enhance students' knowledge and skills in working with machines & other devices like home appliances, toys & mechanical equipment.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
97					CO2	to think out of the box, look at the world around them, identify problems and think of potential solutions	Moderate-M	Strong-H	Weak-L	-	-	Weak-L	-	-	-	-	-	-	-	-

97					CO3	3 To enable them to practice and understand opportunities of working of various equipment with the help of hands-on activities	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	Moderate-M	-	-	-	-	-
97					CO4	Would have undergone real-time hands-on projects using tinkering various equipment to understanding their multiple applications	Moderate-M	Moderate-M	Weak-L	-	-	Weak-L	-	-	Moderate-M	-	-	-	-	-
98	Sem II	0701250209 - PR	TE7396	Software Tools	CO1	Develops a clear understanding about the need of convention standards in the design process.	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
98					CO2	Understand limits, fits, dimensional and geometric tolerances. Understand the types of fits used in engineering applications. Learn about surface roughness and its importance in engineering applications.	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
98					CO3	Learning AutoCAD commands.	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
98					CO4	Creating 2D part drawings using AutoCAD.	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
98					CO5	Creating 2D assembly drawings with BOM using AutoCAD	-	-	-	-	-	-	-	-	-	-	-	Strong-H	-	-
99	Sem II	0701250210 - PP	T6773	Creative Thinking	CO1	Understand the importance of right brain directed thinking complementing left brain directed thinking	Strong-H	-	-	-	Strong-H	-	-	-	-	-	-	-	-	-
99					CO2	Infer and discover processes and methods of creative problem solving	-	Strong-H	-	-	Strong-H	-	-	-	-	-	-	-	-	-
99					CO3	Enhance and correlate their creative and innovative thinking skills	Strong-H	-	-	-	Strong-H	-	-	-	-	-	-	-	-	-
99					CO4	Understand various disruptive innovations and techniques	Strong-H	-	-	-	-	Strong-H	-	-	-	-	-	-	-	-
99					CO5	Analyse and apply various tools of creativity to some basic problem	Strong-H	-	-	-	-	-	-	-	Strong-H	Strong-H	-	-	-	-
100	SEM IV	0701250401 - PP	T8000	Service Learning	CO1	to Improve students' ability to apply theoretical knowledge practically in the community.	-	Moderate-M	-	Weak-L	Weak-L	Strong-H	Moderate-M	Strong-H	-	Strong-H	Weak-L	Strong-H	-	-
100					CO2	Learn to understand difficulties or problems which are already existing, problem analysis, problem-solving, critical thinking, and cognitive development.	-	Strong-H	Weak-L	Moderate-M	-	Moderate-M	Strong-H	Moderate-M	Weak-L	Strong-H	-	Moderate-M	-	-
100					CO3	improved ability of understanding the complexity and ambiguity of issues existing in the real life.	Moderate-M	-	Moderate-M	-	Weak-L	Moderate-M	Strong-H	Moderate-M	Weak-L	-	Moderate-M	Weak-L	-	-
100					CO4	Greater interpersonal development, particularly the ability to work well with others, and build leadership and communication skills. Acting with compassion, honesty and commitment	Weak-L	Moderate-M	Strong-H	Strong-H	Weak-L	Weak-L	Strong-H	Moderate-M	Strong-H	Weak-L	Strong-H	Strong-H	-	-
100					CO5	improved social responsibility and citizenship skills as a result of active engagement in community life.	-	Weak-L	Weak-L	-	-	Strong-H	Moderate-M	Strong-H	Strong-H	Strong-H	Moderate-M	Strong-H	-	-
100					CO6	Greater involvement in community service after graduation as it sensitizes students to the community issues/needs.	Moderate-M	-	Strong-H	-	Moderate-M	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	Strong-H	-
101	SEM IV	0701250402 - PP	T7960	Statistics, Probability and Numerical Methods	CO1	Apply numerical methods to solve algebraic and transcendental equations	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101					CO2	Apply interpolation formulae to predict the value of any intermediate term and evaluate integration by numerical methods	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101					CO3	Determine numerical solutions of ordinary differential equations	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101					CO4	Calculate measures of dispersions, coefficient of variation, coefficient of correlation	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101					CO5	Estimate the value of dependent variable using regression analysis	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101					CO6	Compute probabilities using probability distributions (discrete and continuous)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102	SEM IV	0701250403 - PR	T7961	Statistics, Probability and Numerical Methods lab	CO1	Apply MATLAB Built in functions to carry out matrix operations. Calculate Eigen values, Eigen vectors using MATLAB	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102					CO2	Compute solution of system of simultaneous equations by gauss elimination	-	-	-	-	-	-	-	-	-	-	-	-	-	-

102					CO3	Write a code to evaluate numerical interpolation, differentiation and integration	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102					CO4	Find numerical solution of ordinary differential equations using MATLAB code	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102					CO5	Write MATLAB code for solving partial differential equations using finite difference methods	-	-	-	-	-	-	-	-	-	-	-	-	-	-
102					CO6	Use R software to carry out statistical computations	-	-	-	-	-	-	-	-	-	-	-	-	-	-
103	SEM IV	0701250404 - PP	T7632	Manufacturing Technology	CO1	Understand the basics of the Conventional machine tools and introduction to CNC.	Strong-H	Moderate-M	Moderate-M	-	Moderate-M	-	Strong-H	-	Moderate-M	-	-	-	-	-
103					CO2	Analyze and practically correlate Theory of Metal Cutting and reciprocating machines	Strong-H	Moderate-M	Strong-H	Moderate-M	Moderate-M	-	-	Strong-H	-	Strong-H	-	Moderate-M	-	-
103					CO3	Explain various casting processes	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-
103					CO4	Understand and select the appropriate Welding process	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Strong-H	-	-	-	-
103					CO5	Classify & analyze various Forging & Extrusion Processes	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Moderate-M	-	Strong-H	-	-	-	-	-	-
103					CO6	Understand and explain Rolling & Drawing processes	Strong-H	Moderate-M	Strong-H	Moderate-M	-	Strong-H	-	Moderate-M	-	Moderate-M	-	-	-	-
104	SEM IV	0701250405 - PR	T7633	Manufacturing Technology Lab	CO1	Understand and observe the mechanism of various components, accessories and working of conventional machines such as lathe, drilling, grinding and shaping machines.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104					CO2	Apply the basic knowledge to produce engineering components and study various operations performed.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
104					CO3	Identify the significance of non- conventional machining over conventional.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105	SEM IV	0701250406 - PP	TE7372	Heat Transfer	CO1	To understand the basic laws of heat transfer.	Weak-L	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
105					CO2	Understand and use of conductive heat transfer, minimum thickness of insulation. Develop solutions for transient heat transfer in simple geometries	Weak-L	Moderate-M	-	-	Strong-H	-	-	-	Moderate-M	-	-	-	-	-
105					CO3	Understand and use convective heat transfer. Analyze and apply empirical correlations in connection with the heat transfer at convection	Moderate-M	Weak-L	-	-	-	-	Strong-H	-	-	-	-	Moderate-M	-	-
105					CO4	Understand and use radiative heat transfer	Weak-L	Moderate-M	Strong-H	-	-	-	-	-	Strong-H	-	-	Strong-H	-	-
105					CO5	Perform basic heat exchanger calculations and implement heat exchanger designs.	Moderate-M	Weak-L	Moderate-M	-	Strong-H	-	Strong-H	-	-	-	-	Moderate-M	-	-
106	SEM IV	0701250407 - PR	T7619	Heat Transfer Lab	CO1	Perform an experiment to find the thermal conductivity of metal rod and insulating powder.	Strong-H	Moderate-M	Moderate-M	Strong-H	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	-	-
106					CO2	Compare between natural convection and forced convection through experimentations	Strong-H	Moderate-M	-	-	-	-	-	-	Moderate-M	-	-	Moderate-M	-	-
106					CO3	Understand and use convective heat transfer. Analyse and apply empirical correlations in connection with the heat transfer at convection	Moderate-M	Strong-H	-	-	-	-	Weak-L	-	Moderate-M	-	-	Moderate-M	-	-
106					CO4	Discuss the distribution of temperature along the length of a pin fin and its usage in practical applications	Weak-L	Moderate-M	Strong-H	-	-	-	-	-	Strong-H	-	-	Strong-H	-	-
106					CO5	Explain the distribution of temperature in a composite structure	Weak-L	Moderate-M	-	-	-	-	-	-	Moderate-M	-	-	-	-	-
106					CO6	Compare the effectiveness of parallel flow and counter flow heat exchangers	Weak-L	Moderate-M	-	-	-	-	-	-	Moderate-M	-	-	-	-	-
106					CO7	Student can learn how to use modern software tool for analyzing heat transfer problem	Weak-L	Moderate-M	Moderate-M	Moderate-M	Weak-L	-	-	-	Moderate-M	-	-	Moderate-M	-	-
107	SEM IV	0701250408 - PP	T7700	Theory of Machines - I	CO1	Understand the importance of the study of mechanisms machine in mechanical engineering.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	Moderate-M	-	-	-	-	-
107					CO2	Develop kinematic diagrams of the real life mechanisms & identify it's degrees of freedom	Moderate-M	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-
107					CO3	Analyze the given mechanisms for velocity & Acceleration of different points and links using vector polygon approach.	Strong-H	Strong-H	Strong-H	-	-	-	-	-	-	-	-	-	-	-

107					CO4	Design required cam profile for the required output motion for various types of follower motions.	Strong-H	Moderate-M	-	Weak-L	-	-	-	-	-	-	-	-	-	-
107					CO5	Understand benefits and limitations of belts, ropes and chain drives and suggest the suitable drive for give application.	Strong-H	Moderate-M	-	Weak-L	-	-	-	-	-	-	-	-	-	-
107					CO6	Understand the concept of positive drive and suggest the applications where gears should be preferred over belts and rope drives.	Strong-H	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-
108	SEM IV	0701250409 - PR	T7656	Theory of Machines-I Lab	CO1	1. Understand application and working of different mechnisms.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
108					CO2	2. Understand process of simplification of real life mechanism using kinematic model.	Strong-H	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
108					CO3	3. Determine and understand process kinematic analysis for mechanism to determine displacement, velocity & acceleration.	Moderate-M	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-
108					CO4	4. Understand the process of design profile of Cam to get required motion in the follower.	Strong-H	Moderate-M	Weak-L	-	-	-	-	-	-	-	-	-	-	-
108					CO5	5 Understand working of epicyclic gear train and determine torque in different cases.	Moderate-M	Moderate-M	-	-	-	-	-	-	-	-	-	-	-	-
109	SEM IV	0701250410 - PP	F0002	Flexi-Credit Course	CO1	Student will get an overview of IoT and its key components. You will get an understanding of current and future applications of IoT.	Strong-H	Moderate-M	-	-	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	Moderate-M	Weak-L
109					CO2	Student will learn about sensors and be able to use the right sensor for the future IoT projects.	Strong-H	Moderate-M	Strong-H	-	-	-	Moderate-M	-	-	-	-	-	Moderate-M	Weak-L
109					CO3	Student will learn about NodeMCU, a key IoT prototyping platform. This will equip you for understanding the kind of processor you need for your IoT projects.	Strong-H	-	Strong-H	Moderate-M	Strong-H	Strong-H	Moderate-M	-	-	-	-	-	Moderate-M	Weak-L
109					CO4	Student will learn about IOT platforms in general and ThingSpeak in detail. You will get to understand the features of IoT cloud platforms required for to create IoT products.	Strong-H	-	-	Moderate-M	Strong-H	-	Moderate-M	-	-	-	-	-	Moderate-M	Weak-L
109					CO5	Student will be able to understand how to create an IoT prototype.	Strong-H	-	Strong-H	Moderate-M	-	Strong-H	-	-	-	-	-	-	Moderate-M	Weak-L
109					CO6	Student will learn about product development considerations such as power constraints, processor performance, communication overheads and cost.	Strong-H	-	Strong-H	Moderate-M	-	-	Moderate-M	-	-	-	-	-	Moderate-M	Weak-L
110	SEM IV	0701250411 - PR	TE7300	Tinker Lab	CO1	To enhance students' knowledge and skills in working with machines & other devices like home appliances, toys & mechanical equipments.	Strong-H	Weak-L	-	-	-	-	-	-	-	-	-	-	-	-
110					CO2	to think out of the box, look at the world around them, identify problems and think of potential solutions	Moderate-M	Strong-H	Weak-L	-	-	Weak-L	-	-	-	-	-	Moderate-M	Moderate-M	-
110					CO3	To enable them to practice and understand opportunities of working of various equipments with the help of hands-on activities	Moderate-M	Moderate-M	Weak-L	-	-	-	-	-	Moderate-M	-	-	Moderate-M	Weak-L	-
110					CO4	Would have undergone real-time hands-on projects using tinkering various equipments to understanding their multiple applications	Moderate-M	Moderate-M	Weak-L	-	-	Weak-L	-	-	Moderate-M	-	-	Moderate-M	Weak-L	-
111	VIII	070125801 - PR	T7912	Internship	CO1	Understand company organizational structure, products, services, processes, departments, customers, vendors etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111					CO2	Apply theoretical knowledge and concepts (as acquired under mechanical engineering program courses) to solve assignments given by company mentor (in mutual agreement with college mentor)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111					CO3	Identify, formulate and analyse existing engineering problems in industry (as assigned by company) related to design, manufacturing, procurement, quality, maintenance, research, new product development etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-

111					CO4	Suggest solutions to assigned engineering problems considering health, safety, legal and environmental standards/requirements.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111					CO5	Understand and demonstrate effective verbal/written communication, listening and documentation skills.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111					CO6	Demonstrate individual responsibility, participation in teams and management of multiple assignments/projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111					CO7	Develop and demonstrate professional work habits, attitudes, ethics and behaviour	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
112	VIII	070125802 - PP	T7671	Seminar	CO1	Demonstrate competence in identifying relevant information on the given topics.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO2	Utilise visual and audio-visual methods to support their presentation.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO3	Speak clearly and effectively and in a concise manner.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO4	Present information in a well- structured format.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO5	Listen attentively to the presentations of peers to be able to respond effectively and participate in meaning discussions on the subject.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO6	Apply engineering knowledge to solve case studies , asssignments and to complete mini projects.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112					CO7	Learn project management related skills to complete assignments , miniproject etc.	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
112					CO8	Learn skills related to literature survey, report writing and presentation.	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-
113	VIII	070125803 - PP	T7905	Internship(6-8 Weeks)	CO1	Understand company organizational structure, products, services, processes, departments, customers, vendors etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO2	Apply theoretical knowledge and concepts (as acquired under mechanical engineering program courses) to solve assignments given by company mentor (in mutual agreement with college mentor)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO3	Identify, formulate and analyse existing engineering problems in industry (as assigned by company) related to design, manufacturing, procurement, quality, maintenance, research, new product development etc.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO4	Suggest solutions to assigned engineering problems considering health, safety, legal and environmental standards/requirements.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO5	Understand and demonstrate effective verbal/written communication, listening and documentation skills.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO6	Demonstrate individual responsibility, participation in teams and management of multiple assignments/projects	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113					CO7	Develop and demonstrate professional work habits, attitudes, ethics and behaviour	-	-	-	-	-	-	-	-	-	-	-	Moderate-M	-	-