AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER
Department of Mechanical Engineering
Course Outcome (CO)

Third Year -2015 Course			
Course Code	**Course Name**	**Course Outcomes**	
Semester I			
302041	**Design of Machine Elements-I**	C301.1	Understood the design steps, its considerations, standards, selection of material, factor of safety and apply in designating of simple machine elements like Cotter joint, Knuckle joint and levers.
		C301.2	Solve the design problems of shaft ,keys and coupling and evaluate the dimensions of different couplings
		C301.3	Understand the stress concentration and fatigue failure and analyze design problems of the machine elements under cyclic loading
		C301.4	Apply the design knowledge to evaluate the dimensions of power screws such as Screw jack, C-Clamps and toggle jack etc..
		C301.5	Distinguish the applications of threaded and welded joints and design the appropriate screw and weld size for different applications.
		C401.6	Understand the different types of springs
302042	**Heat Transfer**	C302.1	Understand and apply the modes of heat transfer equations for one dimensional thermal system.
		C302.2	Implement the general heat conduction equation to thermal systems and analyze the different types of fins.
		C302.3	Apply the transient heat conduction equation to lumped systems
		C302.4	Analyze the heat transfer rate in natural and forced convection.

		C302.5	Interpret heat transfer by radiation between objects with simple geometries
		C302.6	Analyze the heat transfer equipment and investigate the performance
302043	**Theory of Machines-II**	C303.1	Analyze speed and torque in Epicyclic gear trains, which will be the prerequisite for gear box design.
		C303.2	Perform force analysis of Spur, Helical, Bevel, Worm and Worm gear.
		C303.3	Analyze speed and torque in Epicyclic gear trains, which will be the prerequisite for gear box design.
		C303.4	Design cam profile for given follower motions and understand cam jump phenomenon, and advance cam curves.
		C303.5	Synthesize a four bar mechanism with analytical and graphical method.
		C303.6	Analyze the Gyroscopic couple or effect for stabilization of ship, Aeroplane and four wheeler vehicle and can choose appropriate drive for given application. (stepped/stepless)
302044	**Turbo Machines**	C304.1	Apply fluid mechanics and thermodynamics principles to turbomachines to calculate impact of jet on vanes
		C304.2	Design and study the performance of Impulse water Turbines.
		C304.3	Design and study the performance of Reaction water Turbines.
		C304.4	Study steam nozzles and analyze the performance of steam turbines.
		C304.5	Design and analyze the performance of Centrifugal Pumps.
		C304.6	Study and analyze the performance of Centrifugal and Axial flow
302045	**Metrology and Quality Control**	C305.1	Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.

		C305.2	Apply measurement tool, techniques and design of gauges for engineering application.
		C305.3	Understand advanced measurement systems and its application.
		C305.4	Understand and apply knowledge of quality concepts, quality control tools and techniques.
		C305.5	Analyze statistical quality control tools and techniques.
		C305.6	Understand Quality Management Systems
302046	**Skill Development**	C306.1	Understand & apply theoretical knowledge in practice
		C306.2	Have knowledge of the different appropriate tools and tackles used in machine assembly shop
		C306.3	Know & utilize practical aspect of the each component in the assembly of the machine
		C306.4	Learn & apply geometric dimensioning & tolerancing (GD &T) to mechanical components.
		C306.5	Develop the skills for holding, dismantling and assembly of mechanical systems
		C306.6	Expose the students to leadership and team-building skills of shop floor activities with safe working practices and conducive working environments
Semester II			
302047	**Numerical Methods and Optimization**	C307.1	Use appropriate Numerical Methods to solve complex mechanical engineering problems.
		C307.2	Formulate algorithms and programming.
		C307.3	Use of Mathematical Solver to get the solution
		C307.4	Apply the least square and interpolation technique for analysis of engineering problems.
		C307.5	Generate Solutions for real life problem using mathematical &optimization techniques.
		C307.6	Analyze the research problem
302048	**Design of Machine Elements-II**	C308.1	Design spur gears based on beam strength, wear strength by estimating dynamic tooth load by velocity factor and Buckingham’s equation.

		C308.2	Design Helical and Straight Bevel Gear based on Beam Strength, Wear strength by estimating effective load based on Velocity factor (Barth factor) and Buckingham's equation.
		C308.3	Select rolling contact bearings from manufacturer's catalogue by calculating static and dynamic load carrying capacities.
		C308.4	Design worm and worm gear based on Strength and Wear ratings.
		C308.5	Select belt drive, wire ropes and chain drive from manufacturer's catalogue.
		C308.6	Design sliding contact bearing by considering the different design parameters such as Length to Diameter ratio, Unit bearing Pressure, Radial Clearance, minimum oil film thickness.
302049	**Refrigeration and Air Conditioning**	C309.1	Illustrate the fundamental principles and applications of refrigeration and air conditioning system
		C309.2	Obtain cooling capacity and coefficient of performance by conducting test on vapour compression refrigeration systems.
		C309.3	Understand the properties, applications and environmental issues of different refrigerants
		C309.4	Calculate cooling load for air conditioning systems used for various applications.
		C309.5	Study and operate the refrigeration and air conditioning systems.
		C309.6	Understand, analyze and design of air distribution system.
302050	**Mechatronics**	C310.1	Understand the knowledge of different sensors and Actuators, for different industrial application
		C310.2	Recognize key elements of Mechatronics system, representation into block diagram & Understand concept of transfer function, block diagram reduction and analysis.

		C310.3	Understand interfacing of sensor and actuator with DAQ & microcontroller to apply this knowledge for different industrial application.
		C310.4	Understand the concept of PLC system and its ladder programming, and significance of PLC systems in industrial application.
		C310.5	Able to do the system modeling and analysis in time domain and frequency domain.
		C310.6	Apply the knowledge of control actions such as Proportional, derivative and integral in different industrial Processes.
302051	**Manufacturing Process-II**	C311.1	Understand and apply the knowledge of metal cutting phenomena.
		C311.2	Select process parameter and tools for obtaining desired machining characteristics.
		C311.3	Understand principles of various finishing processes.
		C311.4	Understand the application of modern machining processes.
		C311.5	Create knowledge about the working and programming techniques for various CNC machines and tools.
		C311.6	Learn and apply the knowledge of Jigs and Fixtures for variety of operations.
302052	**Machine Shop-II**	C312.1	Apply the knowledge of various manufacturing processes
		C312.2	Understand the selection of machining process to manufacture any component
		C312.3	Analyze the various process parameters and their effect on processes
		C312.4	Evaluate and validate all process of operations
		C312.5	Develop job with advanced processing techniques
302053	**Seminar**	C313.1	Identify topic of interest and develop a thought process for technical presentation.
		C313.2	Organize a detailed literature survey and build a document with respect to technical publications

		C313.3	Analysis and comprehension of proof-of-concept and related data
		C313.4	Effective presentation and improve soft skills
		C313.5	Make use of recent technology for creating technical reports
302054	**Audit Course - Lean Management**	C314D.1	UNDERSTAND the concept of Lean Management
		C314D.2	CLASSIFY AND DESCRIBE various lean management techniques
		C314D.3	APPLY lean management technique for continues improvement program of the organization