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

Third Year -2012 Course			
Course Code	**Course Name**	**Course Outcomes**	
Semester I			
302041	**Design of Machine Element-1**	C301.1	Students shall understand and apply the design steps, its considerations, and standards in designing of simple machine elements.
		C301.2	Ability to analyze the stress and strain of mechanical components and understand, identify and quantify failure modes for mechanical part.
		C301.3	Students shall understand and apply the geometric, dimensional tolerences and create the assembly and detailed drawing of different machine elements like cotter and knuckle joints, couplings, screw jacks and springs.
		C301.4	Enhancement in proficiency of CAD software for designing Mechanical systems and to generate production drawing.
		C301.5	Ability to design mechanical system for fluctuating loads.
302042	**Heat Transfer**	C302.1	Formulate basic equations of heat transfer and apply to heat transfer problems.
		C302.2	Apply heat transfer principles to design and evaluate performance of thermal systems.
		C302.3	Calculate the effectiveness and rating of heat exchangers.
		C302.4	Calculate heat transfer by radiation and apply between objects with simple geometries.
		C302.5	Calculate and evaluate the impact of boundary conditions on the solutions of heat transfer
		C302.6	Evaluate the contribution of different modes of heat transfer.
302043	**Theory of Machine- II**	C303.1	The students will understand the gear theory which will be the prerequisite for gear design.
		C303.2	The student will conversant with working principle of control mechanism.
		C303.3	The students to analyze speed and torque in Epicyclic gear trains, which will be the prerequisite for gear box design
		C303.4	The student will understand design of mechanism and cam profile.
		C303.5	The students will synthsize a four bar mechanism with analytical and graphical method
		C303.6	Student will analyze the Gyroscopic couple for stabilization of ship, Aeroplane and four wheeler vehicle and can select appropriate drive for given application.
302044	**Metrology and Quality Control**	C304.1	Understand the methods of measurement, selection of measuring instruments / standards of measurement, carryout data collection and its analysis.

		C304.2	An ability to design gauges to meet desired needs within realistic constraints.
		C304.3	An ability to metrology of threads, gears and advanced metrology and to perform experiments, as well as to analyse and interpret data.
		C304.4	Understand and use/apply Quality Control Techniques/ Statistical Tools appropriately.
		C304.5	Develop an ability of problem solving and decision making by identifying and analyzing the cause for variation and recommend suitable corrective actions for quality improvement.
302045	**Hydraulics and Pneumatics**	C305.1	Working principle of various components used for hydraulic & pneumatic systems.
		C305.2	Identify various components of hydraulic & pneumatic systems.
		C305.3	Ability to select appropriate components required for hydraulic and pneumatic systems.
		C305.4	Ability to design hydraulic and pneumatic system for industrial applications.
		C305.5	Ability to understand industrial applications of hydraulic and pneumatic system.
		C305.6	Troubleshooting of hydraulic & pneumatic circuits.
302046	**Skill Development**	C306.1	To understand & apply theoretical knowledge in practice.
		C306.2	To have knowledge of the different appropriate tools and tackles used in machine assembly shop.
		C306.3	To know & utilize practical aspect of the each component in the assembly of the machine
		C306.4	To learn & apply geometric dimensioning & tolerancing (GD &T) to mechanical components.
		C306.5	To develop the skills for holding, dismantling and assembly of mechanical systems.
		C306.6	To expose the students to leadership and team- building skills of shop floor activities with safe working practices and conducive environments.
Semester II			
302047	**Numerical Methods and Optimization**	C307.1	Evaluate the roots of equations and simultaneous equation by using numerical methods
		C307.2	Generate Solutions for real life problem using optimization techniques.
		C307.3	Solve & apply numerical differential, partial differential & Integration equations.
		C307.4	Apply least square and interpolation technique for analysis of engineering problems
		C307.5	Develop flowchart and impliment using suitable solver software
302048	**Design of Machine**	C308.1	Apply the knowledge and fundamental concept for designing a spur gear, helical gear, bevel gear and worm gear pair.

	Elements - II	C308.2	Select belt drive, wire ropes and chain drive from manufacturer's catalogue.
		C308.3	Ability to design and select different types of bearings from manufacturer's catalogue.
		C308.4	Design a gear box for practical applications.
		C308.5	Ability to design and analyze Mechanical transmission systems
302049	**Turbo machines**	C304.1	To Apply fluid mechanics and thermodynamics principles to turbo machines
		C304.2	To Design and calculate different parameters for turbo machines
		C304.3	Ability to formulate design criteria
		C304.4	To Predict performance of turbo machine using model analysis
		C304.5	Prerequisite to CFD and Industrial fluid power courses
302050	**Mechatronics**	C310.1	Understand principles of sensors /Actuators, its characteristics also its interfacing with DAQ microcontroller & apply this knowledge 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 the concept of PLC system and its ladder programming, and significance of PLC systems in industrial application
		C310.4	PID control implementation on real time systems
		C310.5	Development of PLC ladder programming and implementation of real life system
302051	**Manufacturing Process II**	C311.1	Student will able to apply the knowledge of various manufacturing processes.
		C311.2	To analyze the various process parameters and their effect on processes.
		C311.3	Student will able to understand the application of modern machining.
		C311.4	To learn and apply the knowledge of Jigs and Fixtures for variety of operations.
		C311.5	To create knowledge about the working and programming techniques for various machines and tools
302052	**Machine Shop II**	C312.1	Utilize the Engineering knowledge to Perform welding using TIG/MIG/ Resistance/Gas welding technique
		C312.2	Make Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques
		C312.3	Take a part in Performing cylindrical/surface grinding operation and Evaluate its machining time
		C312.4	Determine number of indexing movements required and acquire skills to Produce a spur gear on a horizontal milling machine

		C312.5	Elaborate industry visit report
		C312.6	Understand procedure of plastic processing
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