

GOVERNMENT COLLEGE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF PRODUCTION ENGINEERING

22PPC619 - AUTOMATIONANDCIM		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Describe the fundamental of automation and CIM, Automation in machine tool changing, tool transfer and work part transfer.	PO1
CO2	Explain the automated material handling and storage systems, concept of group technology and flexible manufacturing system.	PO1
CO3	Apply the concept of automation in industry, concurrent engineering, and industrial robot applications.	PO6, PO9
CO4	Illustrate the transfer lines without and with buffer storage, Engineering analysis of storage systems.	PO2
CO5	Describe the Steady state optimization, Adaptive control, Direct Digital Control, Distributed Control systems, discrete process control and Programmable Logic controllers.	PO1

MAPPING																
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CO1	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	2	-	-	2	-	-	-	-	-	2	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22PPC619	3	-	-	-	-	2	-	-	2	-	-	-	-	-	2	-

22PPC620 - MACHINE ELEMENTS DESIGN		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Describe the various principles of design, static and variable loading conditions to determine safety factors and predict fatigue life using failure theories.	PO1, PO2, PO3, PO10, PO11, PO12
CO2	Design transmission shafts for strength and rigidity, and select appropriate bearings based on life and dynamic load ratings.	PO1, PO2, PO3, PO10, PO11, PO12
CO3	Design permanent (welded), temporary (bolted) joints, flange couplings and compute parameters for design of helical and leaf springs.	PO1, PO2, PO3, PO10, PO11, PO12
CO4	Explain the various design concepts of flexible drive systems (V-belts, flat belts and roller chains) by analyzing power requirements.	PO1, PO2, PO3, PO10, PO11, PO12
CO5	Apply the design concepts of spur gear, helical gears, gearbox and compute the ray diagram and kinematic layout of gearbox.	PO1, PO2, PO3, PO10, PO11, PO12

MAPPING															
CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	3	1	-	-	-	-	-	-	2	1	2	2	-	-
CO2	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
CO3	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
CO4	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
CO5	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
22PPC620	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-

22PPC621 - FLUID POWER DRIVES AND CONTROLS		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the fundamentals and working principles of “hydraulics and pneumatics” and its various components namely pumps, compressors, actuators, valves, control elements, accumulators, intensifiers, electrical switches, microprocessor controllers and Programmable Logic Controllers (PLCs).	PO1
CO2	Select the appropriate hydraulic/pneumatic components to design the circuit for specific application.	PO1, PO2
CO3	Analyze the logical requirements of the hydraulic/pneumatic circuit for specific application, fault finding and troubleshooting.	PO1, PO2
CO4	Design the hydraulic/pneumatic circuit for specific application with due logical considerations.	PO1, PO2, PO3
CO5	Develop and simulate the hydraulic/pneumatic circuit with electrical/microprocessor controls through ladder logics/PLC programs.	PO1, PO2, PO3, PO5

MAPPING															
CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	2	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO4	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
CO5	3	3	-	-	3	-	-	-	-	-	-	-	2	2	-
22PPC621	3	3	2	-	2	-	-	-	-	-	-	-	2	2	-

22PPC622 - STATISTICAL QUALITY CONTROL AND RELIABILITY ENGINEERING		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the basic concepts involved in manufacturing process control for variables including control charts (\bar{X} , R, σ), quality assurance, and process variation.	PO1, PO2, PO3, PO4,
CO2	Apply control chart techniques for attributes such as p-chart, np-chart, c-chart, and u-chart to monitor process performance and identify out-of-control conditions.	PO1, PO2, PO3, PO4,
CO3	Analyze acceptance sampling methods including single, double, and multiple sampling plans, OC curves, AQL, LTPD, and AOQL.	PO1, PO2, PO3, PO4,
CO4	Design and evaluate reliability systems using life testing, failure data analysis, hazard rate, and system configurations (series, parallel, mixed).	PO1, PO2, PO3, PO4,
CO5	Evaluate the reliability improvements such as Pareto analysis, redundancy models, product lifecycle etc., and demonstrate various optimization techniques using engineering applications.	PO1, PO2, PO3, PO4, PO5

22PPE619 - UNCONVENTIONAL MANUFACTURING PROCESSES		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the working principles, classification, advantages and limitations of unconventional machining processes.	PO1, PO2
CO2	Illustrate mechanical energy based non-traditional machining processes and interpret the influence of process parameters.	PO1, PO2, PO3
CO3	Analyze electrochemical, chemical and thermal metal removal processes for appropriate industrial applications.	PO1, PO2, PO3, PO4
CO4	Compare forming and foundry based unconventional processes for material, accuracy and productivity requirements.	PO1, PO2, PO3
CO5	Select the suitable rapid prototyping techniques for product development and manufacturing applications.	PO1, PO2, PO3, PO5, PO11

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	3	2	2	-	-	-	-	-	-	-	-	-	-	-
CO4	2	3	2	-	-	-	-	-	-	-	-	-	2	-	-
CO5	2	3	3	-	2	-	-	-	-	-	2	-	-	2	-
22PPE619	3	3	2	2	2	-	-	-	-	-	2	-	2	2	-

22PPE626- SIX SIGMA		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to		
CO1	Discuss the quality perception, descriptive statistics and mathematical distribution function related with six sigma.	PO1, PO2
CO2	Explain the basic concepts of six sigma	PO1, PO2, PO11
CO3	Elaborate the methodology of six sigma.	PO1, PO2, PO7, PO11
CO4	Apply various six sigma tools in industrial environment.	PO1, PO2, PO5
CO5	Demonstrate software used, interpretation of tools and data to decrease expenses and reduce cycle times.	PO2, PO3, PO5, PO10, PO11

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	1	1
CO2	2	1	-	-	-	-	-	-	-	-	2	-	-	-	-
CO3	2	1	-	-	-	-	1	-	-	-	2	-	1	1	2
CO4	1	2	-	-	3	-	-	-	-	-	-	-	1	1	1
CO5	-	2	2	-	3	-	-	-	-	1	2	-	2	2	2
22PPE626	2	1	2	-	3	-	1	-	-	1	2	-	1	1	2

22PPC630 - INDUSTRIAL SAFETY ENGINEERING		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the evolution of safety concepts, safety policies, and the role of safety culture in identifying hazards within an industrial environment.	PO1, PO6, PO8
CO2	Illustrate workplace accidents using investigation techniques and the domino sequence to identify unsafe acts/conditions and calculate accident costs.	PO1, PO2, PO4, PO6
CO3	Apply appropriate safety education and training methods to create safety awareness and promote safe practices among employees.	PO6
CO4	Utilize safety management principles and analytical tools like Fault Tree Analysis (FTA) to plan for safety optimization and productivity.	PO1, PO2, PO3, PO5
CO5	Demonstrate audit methodologies to prepare audit checklists, non-conformity reports (NCR) and safety audits effectively.	PO1, PO2, PO4, PO6, PO8
CO6	Interpret national and international regulations, including the Factories Act, Pollution Control Acts, and OHSAS/ISO standards, to ensure industrial compliance.	PO1, PO6, PO7, PO8

MAPPING															
CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS02	PS03
CO1	2	-	-	-	-	3	-	2	-	-	-	-	2	-	-
CO2	3	3	-	3	-	3	-	-	-	2	2	-	3	3	-
CO3	-	-	-	-	-	3	-	-	2	3	2	2	-	-	-
CO4	3	3	2	-	2	-	-	-	-	-	3	-	3	3	2
CO5	2	2	-	3	-	2	-	2	-	3	2	-	2	2	-
CO6	3	-	-	-	-	3	3	3	-	-	-	2	3	-	-
22PPC630	3	3	2	3	2	3	3	2	2	3	2	2	3	3	2

22PES609- DESIGN THINKING FOR PRODUCTION ENGINEERING		SEMESTER VI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the fundamentals of design thinking	-
CO2	Identify and define real-world production problems	PO2, PO3, PO, PO5, PO9, PO10
CO3	Generate innovative design solutions	PO2, PO3, PO, PO5, PO9, PO10
CO4	Develop and analyze designs using CAD & CAE tools	PO2, PO3, PO, PO5, PO9, PO10
CO5	Optimize designs for manufacturability and application	PO2, PO3, PO, PO5, PO9, PO10

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
CO1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	2	1	2	-	-	-	2	2	-	-	2	3	-
CO3	-	2	3	3	2	-	-	-	2	2	-	-	2	3	-
CO4	-	2	3	3	3	-	-	-	2	1	-	-	2	3	-
CO5	-	3	3	3	3	-	-	-	1	2	-	-	2	3	-
22PES609	-	3	3	2	2	-	-	-	2	2	-	-	2	3	-

22PEE601 - AUTOMATION AND CONTROLSYSTEMS LABORATORY		SEMESTERVI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Design and develop the simple industrial application of basic pneumatic circuits.	PO3, PO6
CO2	Design and develop the simple industrial application of electro pneumatic circuits.	PO3, PO6
CO3	Design and develop the simple industrial application of hydraulic circuits.	PO3
CO4	Design and develop the simple industrial application of electro hydraulic control circuits.	PO3, PO6
CO5	Control the speed and temperature of electrical drives.	PO1

22PPC406 - FLUID MECHANICS AND MACHINERY		SEMESTER IV
COURSE OUTCOME:		
The Course Outcome (CO)		PO's Mapped
All the end of the course, the students will have the ability to:		
CO1	Summarize the basic units, dimension and fundamentals properties of fluid, Fluid statics and pressure measurement techniques and its applications.	PO1, PO2, PO4
CO2	Analyze the fluid kinematics and dynamics, including types of flow, continuity and energy equation, flow measurement and pipe flow characteristics.	PO1, PO2, PO4
CO3	Apply the dimension analysis technique and similitude concepts for model studies and prototype performance prediction.	PO1, PO2, PO4
CO4	Differentiate the working principles, performance characteristics of various turbines and design the governing hydraulic of turbines.	PO1, PO2, PO3, PO4
CO5	Determine the working principles, performance characteristics of pumps and design of pumps.	PO1, PO2, PO3, PO4

22PPC407 - MECHANICS OF MATERIALS		SEMESTER IV
COURSE OUTCOME:		
The Course Outcome (CO)		PO's Mapped
All the end of the course, the students will have the ability to:		
CO1	Explain the fundamental concepts of stress, strain, elastic constants, and mechanical properties of materials to understand structural behavior.	PO1
CO2	Apply the principles of mechanics of materials to determine stresses, strains, and deformations in axially loaded members and under thermal effects.	PO1, PO5
CO3	Analyze bending stresses, shear stresses, and deflections of beams subjected to different loading conditions.	PO2
CO4	Design structural members such as shafts and beams by evaluating torsional and bending strength under specified loading conditions.	PO3
CO5	Evaluate combined stresses and apply appropriate failure theories to ensure safe and reliable engineering design.	PO4
CO6	Engage in independent learning to apply mechanics of materials concepts in real-world engineering problems using modern tools, teamwork, ethical practices, and effective communication.	PO6, PO8, PO9, PO11

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	1	1
CO2	3	-	-	-	2	-	-	-	-	-	-	-	2	2	1
CO3	-	3	-	-	-	-	-	-	-	-	-	-	3	2	2
CO4	-	-	3	-	-	-	-	-	-	-	-	-	3	2	2
CO5	-	-	-	2	-	-	-	-	-	-	-	-	3	2	3
CO6	-	-	-	-	-	2	-	2	2	-	3	-	2	3	2
22PPC407	3	3	3	2	2	2	-	2	2	-	3	-	3	2	2

22PPC408 - CNC TECHNOLOGY		SEMESTER IV
COURSE OUTCOME:		
The Course Outcome (CO)		PO's Mapped
All the end of the course, the students will have the ability to:		
CO1	Describe the principles of CNC, DNC, Control systems and various types of CNC machines.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO12
CO2	Apply knowledge including the structure and various elements involved in CNC machines.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12
CO3	Describe constructional features of various electrical drives and transducers used in CNC machine tools.	PO1, PO2, PO3, PO4, PO5, PO6, PO7, PO9, PO10, PO11, PO12
CO4	Formulate various CNC programs and demonstrate the generation of CNC codes using CAM software.	PO1, PO2, PO3, PO5, PO9, PO10, PO12
CO5	Summarize tooling and work holding devices for CNC machine tools.	PO1, PO2, PO3, PO5, PO6, PO7, PO8, PO9, PO10, PO11, PO12

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	2	2	3	1	-	1	3	-	1	1	-	-
CO2	2	1	1	2	3	3	1	-	1	3	1	1	1	-	-
CO3	2	1	1	2	3	3	1	-	1	3	1	1	2	-	-
CO4	2	1	1	-	2	-	-	-	1	3	-	2	-	3	-
CO5	2	1	1	-	2	3	3	1	1	3	2	1	2	-	-
22PPC408	2	1	1	2	3	3	2	1	1	3	1	2	2	1	-

22PPC409 - PROCESS PLANNING AND COST ESTIMATION		SEMESTER IV
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the fundamentals of process planning, its role in the manufacturing cycle, and interpret engineering drawings with tolerances.	PO1, PO2
CO2	Apply systematic process planning steps to select manufacturing processes, machines, tools, fixtures, and inspection methods for given components.	PO1, PO2, PO3, PO4
CO3	Analyze cost components, cost elements, overheads, and break-even conditions involved in manufacturing systems.	PO1, PO2, PO3, PO4, PO5
CO4	Estimate the manufacturing cost for welded, forged components and powdermetallurgy parts.	PO2, PO3, PO4, PO5, PO7
CO5	Calculate machining time and production cost for various manufacturing operations such as turning, drilling, milling, and grinding.	PO2, PO3, PO4, PO5, PO7

MAPPING																
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3	
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	3	2	1	-	-	-	-	-	-	-	-	-	1	-	-
CO3	1	2	3	2	1	-	-	-	-	-	-	-	-	-	-	1
CO4	-	1	2	2	3	-	2	-	-	1	1	2	-	-	-	1
CO5	-	1	2	2	3	-	2	-	-	1	1	2	-	-	-	1
22PPC409	2	2	2	2	2	-	2	2	-	1	1	2	1	-	-	1

22PES408 – ENGINEERING EXPLORATION		SEMESTER IV
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Explain the fundamentals and working principles of Engineering components in various Engineering fields.	PO1, PO5, PO12
CO2	Analyze the societal requirement and address them by engineering product.	PO1, PO2, PO4, PO5, PO6, PO7, PO9, PO10, PO12
CO3	Select the appropriate techniques and components to design and fabricate the model/prototype of the engineering product.	PO1, PO2, PO3, PO4, PO9, PO10, PO12
CO4	Design and Fabricate the model/prototype of the Engineering Product.	PO1, PO2, PO3, PO4, PO9, PO10, PO12
CO5	Develop the skills in project management and report writing.	PO1, PO2, PO3, PO4, PO5, PO9, PO10, PO11, PO12

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	2	3	2	1	-	-	-	-	-	-	-	-	1	-	-
CO3	1	2	3	2	1	-	-	-	-	-	-	-	-	-	1
CO4	-	2	2	3	2	-	1	-	-	-	-	-	-	-	-
CO5	-	1	2	2	3	-	2	-	-	1	1	2	-	-	1
22PES408	2	2	2	2	2	-	2	2	-	1	1	2	1	-	1

22PPC411 - PRODUCTION DRAWING		SEMESTER IV
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
CO1	Describe the conventions in assembly drawing	PO1, PO2, PO3, PO10, PO12
CO2	Discuss the Fits and Tolerances	PO1, PO2, PO3, PO10, PO12
CO3	Explain the Geometric Dimensioning & Tolerancing	PO1, PO2, PO3, PO10, PO12
CO4	Identify machining and surface finish symbols.	PO1, PO2, PO3, PO10, PO12
CO5	Construct an assembly drawing of various machine units.	PO1, PO2, PO3, PO10, PO12

MAPPING															
CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
CO2	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
CO3	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
CO4	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
CO5	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
22PPC411	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-