

GOVERNMENT COLLEGE OF TECHNOLOGY, COIMBATORE
DEPARTMENT OF PRODUCTION ENGINEERING

22PPC619 - AUTOMATIONANDCIM		SEMESTERVI
COURSE OUTCOMES:		
The Course Outcome (CO)		PO's Mapped
At the end of the course, the students will have the ability to:		
C01	Describe the fundamentalsofautomationandCIM, Automation in machine tool changing, tool transfer and work part transfer.	P01
C02	Explain the automated materialhandlingandstoragesystems, conceptofgroupotechnologyandflexiblemanufacturingsystem.	P01
C03	Apply the concept of automation in industry, concurrent engineering, and industrial robot applications.	P06, P09
C04	Illustrate thetransfer lines without and with buffer storage, Engineering analysis of storage systems.	P02
C05	Describe the Steady state optimization, Adaptive control, Direct Digital Control, Distributed Control systems, discrete process control and Programmable Logic controllers.	P01

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
C01	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C02	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C03	-	-	-	-	-	2	-	-	2	-	-	-	-	2	-
C04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C05	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:		
C01	Describe the various principles of design, static and variable loading conditions to determine safety factors and predict fatigue life using failure theories.	P01, P02, P03, P010, P011, P012
C02	Design transmission shafts for strength and rigidity, and select appropriate bearings based on life and dynamic load ratings.	P01, P02, P03, P010, P011, P012
C03	Design permanent (welded), temporary (bolted) joints, flange couplings and compute parameters for design of helical and leaf springs.	P01, P02, P03, P010, P011, P012
C04	Explain the various design conceptsofflexible drive systems (V-belts, flat belts and roller chains) by analyzing power requirements.	P01, P02, P03, P010, P011, P012
C05	Apply the design concepts ofspur gear, helical gears, gearbox and compute the ray diagram and kinematic layout of gearbox.	P01, P02, P03, P010, P011, P012

MAPPING															
CO'S	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	2	3	1	-	-	-	-	-	-	2	1	2	2	-	-
C02	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
C03	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
C04	2	3	2	-	-	-	-	-	-	2	1	2	2	-	-
C05	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	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	3	-	-	-	-	-	-	-	-	-	-	-	2	2	-
C02	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
C03	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
C04	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
C05	3	3	-	-	3	-	-	-	-	-	-	-	2	2	-
22PPC621	3	3	2	-	2	-	-	-	-	-	-	-	2	2	-

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 andinterpretthe 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	Selectthe suitable rapid prototyping techniques for product development and manufacturing applications.									PO1, PO2, PO3, PO5, PO11	

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	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		
C01	Discuss the quality perception, descriptive statistics and mathematical distribution function related with six sigma.	P01, P02
C02	Explain the basic concepts of six sigma	P01, P02, P011
C03	Elaborate the methodology of six sigma.	P01, P02, P07, P011
C04	Apply various six sigma tools in industrial environment.	P01, P02, P05
C05	Demonstrate software used, interpretation of tools and data to decrease expenses and reduce cycle times.	P02, P03, P05, P010, P011

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
C01	2	1	-	-	-	-	-	-	-	-	-	-	1	1	1
C02	2	1	-	-	-	-	-	-	-	-	2	-	-	-	-
C03	2	1	-	-	-	-	1	-	-	-	2	-	1	1	2
C04	1	2	-	-	3	-	-	-	-	-	-	-	1	1	1
C05	-	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:		
C01	Explain the evolution of safety concepts, safety policies, and the role of safety culture in identifying hazards within an industrial environment.	P01, P06, P08
C02	Illustrate workplace accidents using investigation techniques and the domino sequence to identify unsafe acts/conditions and calculate accident costs.	P01, P02, P04, P06
C03	Apply appropriate safety education and training methods to create safety awareness and promote safe practices among employees.	P06
C04	Utilize safety management principles and analytical tools like Fault Tree Analysis (FTA) to plan for safety optimization and productivity.	P01, P02, P03, P05
C05	Demonstrate audit methodologies to prepare audit checklists, non-conformity reports (NCR) and safety audits effectively.	P01, P02, P04, P06, P08
C06	Interpret national and international regulations, including the Factories Act, Pollution Control Acts, and OHSAS/ISO standards, to ensure industrial compliance.	P01, P06, P07, P08

MAPPING															
CO'S	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	2	-	-	-	-	3	-	2	-	-	-	-	2	-	-
C02	3	3	-	3	-	3	-	-	-	2	2	-	3	3	-
C03	-	-	-	-	-	3	-	-	2	3	2	2	-	-	-
C04	3	3	2	-	2	-	-	-	-	-	3	-	3	3	2
C05	2	2	-	3	-	2	-	2	-	3	2	-	2	2	-
C06	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	P02, P03, P0, P05, P09, P010
CO3	Generate innovative design solutions	P02, P03, P0, P05, P09, P010
CO4	Develop and analyze designs using CAD & CAE tools	P02, P03, P0, P05, P09, P010
CO5	Optimize designs for manufacturability and application	P02, P03, P0, P05, P09, P010

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 CONTROL SYSTEMS LABORATORY		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	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

[illegible]

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:		
C01	Summarize the basic units, dimension and fundamentals properties of fluid, Fluid statics and pressure measurement techniques and its applications.	P01, P02, P04
C02	Analyze the fluid kinematics and dynamics, including types of flow, continuity and energy equation, flow measurement and pipe flow characteristics.	P01, P02, P04
C03	Apply the dimension analysis technique and similitude concepts for model studies and prototype performance prediction.	P01, P02, P04
C04	Differentiate the working principles, performance characteristics of various turbines and design the governing hydraulic of turbines.	P01, P02, P03, P04
C05	Determine the working principles, performance characteristics of pumps and design of pumps.	P01, P02, P03, P04

[illegible]

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:		
C01	Explain the fundamental concepts of stress, strain, elastic constants, and mechanical properties of materials to understand structural behavior.	P01
C02	Apply the principles of mechanics of materials to determine stresses, strains, and deformations in axially loaded members and under thermal effects.	P01, P05
C03	Analyze bending stresses, shear stresses, and deflections of beams subjected to different loading conditions.	P02
C04	Design structural members such as shafts and beams by evaluating torsional and bending strength under specified loading conditions.	P03
C05	Evaluate combined stresses and apply appropriate failure theories to ensure safe and reliable engineering design.	P04
C06	Engage in independent learning to apply mechanics of materials concepts in real-world engineering problems using modern tools, teamwork, ethical practices, and effective communication.	P06, P08, P09, P011

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
C01	3	-	-	-	-	-	-	-	-	-	-	-	2	1	1
C02	3	-	-	-	2	-	-	-	-	-	-	-	2	2	1
C03	-	3	-	-	-	-	-	-	-	-	-	-	3	2	2
C04	-	-	3	-	-	-	-	-	-	-	-	-	3	2	2
C05	-	-	-	2	-	-	-	-	-	-	-	-	3	2	3
C06	-	-	-	-	-	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.	P01, P02, P03, P04, P05, P06, P07, P09, P010, P012
CO2	Apply knowledge including the structure and various elements involved in CNC machines.	P01, P02, P03, P04, P05, P06, P07, P09, P010, P011, P012
CO3	Describe constructional features of various electrical drives and transducers used in CNC machine tools.	P01, P02, P03, P04, P05, P06, P07, P09, P010, P011, P012
CO4	Formulate various CNC programs and demonstrate the generation of CNC codes using CAM software.	P01, P02, P03, P05, P09, P010, P012
CO5	Summarize tooling and work holding devices for CNC machine tools.	P01, P02, P03, P05, P06, P07, P08, P09, P010, P011, P012

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	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.	P01, P02
CO2	Apply systematic process planning steps to select manufacturing processes, machines, tools, fixtures, and inspection methods for given components.	P01, P02, P03, P04
CO3	Analyze cost components, cost elements, overheads, and break-even conditions involved in manufacturing systems.	P01, P02, P03, P04, P05
CO4	Estimate the manufacturing cost for welded, forged components and powdermetallurgy parts.	P02, P03, P04, P05, P07
CO5	Calculate machining time and production cost for various manufacturing operations such as turning, drilling, milling, and grinding.	P02, P03, P04, P05, P07

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	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:		
C01	Explain the fundamentals and working principles of Engineering components in various Engineering fields.	P01, P05, P012
C02	Analyze the societal requirement and address them by engineering product.	P01, P02, P04, P05, P06, P07, P09, P010, P012
C03	Select the appropriate techniques and components to design and fabricate the model/prototype of the engineering product.	P01, P02, P03, P04, P09, P010, P012
C04	Design and Fabricate the model/prototype of the Engineering Product.	P01, P02, P03, P04, P09, P010, P012
C05	Develop the skills in project management and report writing.	P01, P02, P03, P04, P05, P09, P010, P011, P012

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
C01	3	2	–	–	–	–	–	–	–	–	–	–	–	–	–
C02	2	3	2	1	–	–	–	–	–	–	–	–	1	–	–
C03	1	2	3	2	1	–	–	–	–	–	–	–	–	–	1
C04	–	2	2	3	2	–	1	–	–	–	–	–	–	–	–
C05	–	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:		
C01	Describe the conventions in assembly drawing	P01, P02, P03, P010, P012
C02	Discuss the Fits and Tolerances	P01, P02, P03, P010, P012
C03	Explain the Geometric Dimensioning & Tolerancing	P01, P02, P03, P010, P012
C04	Identify machining and surface finish symbols.	P01, P02, P03, P010, P012
C05	Construct an assembly drawing of various machine units.	P01, P02, P03, P010, P012

MAPPING															
CO's	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO 1	PSO 2	PSO 3
C01	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
C02	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
C03	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
C04	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
C05	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-
22PPC411	2	1	1	-	-	-	-	-	-	2	-	1	2	-	-