SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)
Narsapur, West Godavari District, A.P. 534280
DEPARTMENT OF MECHANICAL ENGINEERING

LESSON PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20ME6T03	CAD/CAM	VI	Mechanical Engineering	6	2024-25	18-11-2024

COURSE OUTCOMES

CO1	Classify the hardware and software of CAD systems. [K2]
CO2	Illustrate the curve representation and surface representation. [K3]
CO3	Infer NC, CNC systems and basic programs using G-Codes, M-Codes, APT. [K2]
CO4	Summarize the principles of Group Technology and apply them in grouping parts, CAPP and CIM importance. [K2]
CO5	Discuss about Computer Aided Quality Control and FMS. [K2]

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	CO1: Classify the hardware and software of CAD systems. [K2]		**1.1 Introduction to CAD/CAM**			Chalk & Talk, PPT & Active Learning Methods
		1.1.1	Computers in Industrial Manufacturing	T1, R1	1	
		1.1.2	Product life cycle	T1, R1	1	
		1.1.3	CAD/CAM Hardware: Basic structure	T1, T2	1	
		1.1.4	CPU, Memory Types	T1, R1	1	
		1.1.5	Input Devices & Display Devices	T1, T2	1	
		1.1.6	Hard copy Devices & Storage Devices	T1, T2	1	
			1.2 Computer Graphics			
		1.2.1	Raster scan graphics, coordinate system	T1, R1	1	
		1.2.2	Data base structure for graphics modeling	T1, R1	1	
		1.2.3	Transformation of geometry	T1, T2	1	
		1.2.4	2D & 3D Transformations	T1, R1	1	
		1.2.5	Mathematics of projections	T1, T2	1	
		1.2.6	Clipping	T1, R1	1	
		1.2.7	Hidden surface removal	T1, T2	1	
		CBS	Bresenham's Line Algorithm	Web Source	1	Internet
				Total	**13**	

II	**CO2:** Illustrate the curve representation and surface representation. [K3]	**Geometric Modeling**				
		2.1	Requirements of GM	T1, R1	1	Chalk & Talk, PPT, Video Lecture
		2.2	Geometric models	T1, R1	1	
		2.3	Geometric construction Methods	T1, T2	1	
		2.4	Curve Representation Methods	T1, R1	1	
		2.5	Surface Representation Methods	T1, R1	1	
		2.6	Solid Modelling	T1, T2	1	
		2.7	Basic Geometric Commands:			
		2.8	Layer, Display Control Commands	T1, R1	1	
		2.9	Editing & Dimensioning	T1, R1	1	
		2.10	B Spline and Bezier curve	Web Source	1	
				Total	**10**	

III	**CO3:** Infer NC, CNC systems and basic programs using G-Codes, M-Codes, APT. [K2]	**Part programming for NC machines**				
		3.1	Introduction, NC, NC modes	T1, R1	1	Chalk & Talk, PPT. Flipped Classroom
		3.2	NC elements, CNC machine tools,	T1, T2, R2	1	
		3.3	Structure of CNC machine Tool	T1, T2, R2	1	
		34	Features of machining centre & turning centre	T1, T2	1	
		3.5	CNC part programming: Fundamentals	T1, R2	1	
		3.6	Manual part programming	T1, R2	1	
		3.7	Computer aided part programming	T1, T2	1	
		3.8	Computer aided part programming Problem	T1, R2	1	
		3.9	Direct numerical control and Adaptive control	T1, R2	1	
CBS		CBS	Latest technological advancements in CNC machines: Six-axis machining	Web Source	1	Internet
				Total	**10**	

IV	**CO4:** Summarize the principles of Group Technology and apply them in grouping parts, CAPP and CIM importance. [K2]	**Group technology**				
		4.1	Introduction, Part family	T1, T2	1	Chalk & Talk, PPT, Quiz.
		4.2	Coding and classification	T1, T2, R1	1	
		4.3	Production flow analysis, advantages and limitations	T1, T2	1	
		4.4	Computer aided process planning: Importance, types	T1, T2, R2	1	
		4.5	Retrieval Type & Generative Type.	T1, T2	1	
		4.6	Computer integrated manufacturing systems: Introduction	T1, T2	1	
		4.7	Types of manufacturing systems	T1, T2, R2	1	
		4.8	Machine tools & related equipment	T1, T2	1	
		4.9	CIM benefits	T1, T2 R1	1	
		CBS	Generative-AI, Computing Power, Datafication.	Web Source	1	Internet
				Total	**10**	
V	**CO5:** Discuss about Computer Aided Quality Control and FMS. [K2]	**Computer aided Quality Control**				
		5.1	Introduction, Computers in QC	T1, T2, R2	1	Chalk & Talk, PPT, Seminar Topic.
		5.2	Inspection Methods: Contact inspection methods	T1, T2	1	
		5.3	Non-contact Inspection Methods	T1, T2	1	
		5.4	Optical Inspection Methods	T1, T2, R1	1	
		5.5	Non-Optical Inspection Methods	T1, T2, R1	1	
		5.6	Computer aided testing	T1, T2, R2	1	
		5.7	Computer Aided Quality Control	T1, T2, R2	1	
		5.8	Integration of CAQC with CAD/CAM	T1, T2	1	
CBS			Inspection Technology, Machine Vision.	Web Source	1	Internet
				Total	**09**	
				CUMULATIVE PROPOSED PERIODS	**52**	

Text Books:	
S. No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
T1	P N RAO, CAD/CAM Principles and Applications, 3rd Edition, TATA McGraw Hill Education, 2010
T2	M. Groover & E. Zimmer, CAD/CAM Computer Aided Design and Manufacturing, 1st Edition, Pearson Education, 2003

Reference Books:	
S. No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
R1	Ibrahim Zeid, CAD/CAM Theory and Practice, 2nd Edition, TATA McGraw Hill Education, 2009
R2	Chennakesava R. Alavala, CAD/CAM Concepts and Applications, 1st Edition, Prentice Hall India Learning, 2008
R3	Warren S Seames, Computer Numerical Control concepts and Programming, 4th Edition, Delmar Cengage Learning, 2001.
Web Details	
1	https://www.nptelvideos.com/computer_graphics/computer_graphics_video_lectures.php
2	https://www.youtube.com/watch?v=0IgOapAtauM
3	https://www.youtube.com/watch?v=pPwyYFvRLts

		Name	Signature with Date
i.	Faculty - 1	Mr. Abdul Azeez	
ii.	Faculty - 2	Dr. R. Sanjeev Kumar	
iii.	Course Coordinator	Mr. Abdul Azeez	
iv.	Module Coordinator	Dr. R. Sanjeev Kumar	
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Principal