SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
Accredited by National Board of Accreditation, AICTE, New Delhi,Accredited by NAAC with "A" Grade – 3.32 CGPA,Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi,Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT MECHANICAL ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
16ME7T02	CAD/CAM	VII	MECHANICAL ENGINEERING	6	2021-22	04-10-2021

COURSE OUTCOMES

1	Explain the hardware and software of CAD systems. [K2]
2	Apply mathematical principles in solving problems such as curve representation and surface Representation. [K3]
3	Define NC and CNC systems and write the basic programs using both G-Codes, M-Codes and APT.[K1]
4	Summarize the principles of Group Technology and Apply them in grouping parts as well as Explain CAPP.[K2][K4]
5	Explain about Computer Aided Quality Control and various inspection methods.[K2]
6	Explain about Computer Integrated Manufacturing, and also benefits of CIM.[K2]

UNIT	Outcomes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
			INTRODUCTION AND COMPUTER GRAPHICS			
I	Explain the hardware and software of CAD systems. [K2]	1.1.1	Computers in Industrial Manufacturing	T1	1	Chalk & Talk PPT
		1.1.2	Product life cycle	T2	1	
		1.1.3	CAD/CAM Hardware: Basic structure	T1	1	
		1.1.4	CPU Memory Types	T2, T1	1	
		1.1.5	Input Devices Key Board, Mouse, Light pen, digitizer, Joystick	T1	1	
		1.1.6	Display Devices CRT, LCD, LED, OLED	T1	1	
		1.1.7	Hard copy Devices & Storage Devices. Graphical printers, Plotters, Wrenchester disks, RAM, ROM, EROM	T1	1	

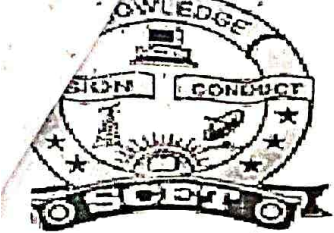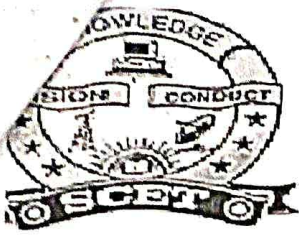|			**Computer Graphics:**			
		1.2.1	Raster scan graphics	T1	1	
		1.2.2	Coordinatesystem Universal, User coordinate system	T1	1	
		1.2.3	Data base structure for graphics modeling	T1	1	
		1.2.4	Transformation of geometry a) Translation b) Scaling c) Rotation d) Mirroring	T1	1	
		1.2.5	3D Transformation	T1	1	
		1.2.6	Mathematics of projections	T1	1	
		1.2.7	Clipping a) Cohen Sutherland clipping b) Sutherland Hodgeman polygon clipping	T1	1	
		1.2.8	Hidden surface removal	T1	1	
Course Beyond the Syllabus		1.3	Solid algorithms, shading, colors	T1	1	
				Total	**16**	
			GEOMETRIC MODELING			
II	Apply mathematical principles in solving problems such as curve representation and surface representation. [K3]	2.1.1	Requirements of GM	T1	1	Chalk & Talk PPT, Video
		2.1.2	Geometric models	T1	1	
		2.1.3	Geometric construction Methods	T1	1	
		2.1.4	Curve Representation Methods	T1	1	
		2.1.4.1	B-Spilne	T1	1	
		2.1.4.2	Bezier Curves	T1	1	
		2.1.5	Surface Representation Methods	T1	1	
		2.2	**Modeling Systems**			
		2.2.1	Basic Geometric commands	T1	1	
		2.2.2	Layers and Display control commands	T1	1	
		2.2.3	Editing Commands	T1	1	
		2.2.4	Dimensioning	T1	1	
		2.2.5	Solid Modeling	T1	1	
Course Beyond the Syllabus		2.3	surface manipulations	T1	1	

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				TOTAL	**13**	

PART PROGRAMMING FOR NC MACHINES:						
III	Define NC and CNC systems and write the basic programs using both G-Codes, M-Codes and APT.[K1]	3.1.1	Numerical Control	T1	1	Chalk & Talk PPT , Video, Flipped classroom
		3.1.2	Numerical Control Modes	T1, R1	1	
		3.1.3	Numerical Control Elements	T1	1	
		3.1.4	Numerical ControlMachine Tools.	T1, R1	1	
		3.1.5	Structure of CNC machine tools,	T1	1	
		3.1.6	Features of Machining Centre & Turning Center	T1	1	
		3.2	**CNC Part Programming**			
		3.2.1	Fundamentals Part Programming	T1	1	
		3.2.2	Manual Part Programming Methods	T1	1	
		3.2.3	Computer Aided Part Programming	T1	1	
		3.2.4	Part Programming problems	T1	1	
		3.2.5	Computer Aided Part Programming	T1	1	
		3.2.6	Computer Aided Part Programming problems	T1	1	

				Total	**12**	

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GROUP TECHNOLOGY:						
IV	Summarize the principles of Group Technology and Apply them in grouping parts as well as Explain CAPP. [K2][K4]	4.1	Group Technology	T1, T2	1	Chalk & Talk, PPT
		4.2	Part family	R1, T2	1	
		4.3	Coding and Classification	T2, R1	1	
		4.4	Optiz system	T2, R1	1	
		4.5	MICLASS system	T2, R1	1	
		4.6	Production flow Analysis	T1, R1	1	
		4.7	Advantages & Limitations of GT	T1, T2	1	
		4.8	Production flow Analysis problems	T1, T2	1	
		4.9	Computer Aided process planning, Importance	T2, R1	1	
		4.10	Retrieval type Process Planning system	T2	1	
		4.11	Generative Type Process planning system	R1, T2	1	

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		4.12	Rank order clustering	R1, T2	1	
				Total	**12**	
V	Explain about Computer Aided Quality Control and various inspection methods.[K2]		**COMPUTER AIDED QUALITY CONTROL**			
		5.1	Terminology in QC	T2	1	Chalk & Talk, PPT , Video
		5.2	The Computer in QC	T2	1	
		5.3	Contact inspection methods CMM	T2, R1	1	
		5.4	Machine Probes	T2, R1	1	
		5.5	Non-contact IM	T2	1	
		5.6	Non optical IM Machin vision, scanning laser beam, Photogrammetry	T2	1	
		5.7	Computer Aided Testing	T2	1	
		5.8	Integration of CAQC with CAD/CAM	T2	1	
				Total	**08**	
VI	Explain about Computer Integrated Manufacturing, and also benefits of CIM.[K2]		**COMPUTER INTEGRATED MANUFACTURING SYSTEMS:**			
		6.1	Types of manufacturing systems a). Special Mfg system b). FMS c). Stand alone Mfg System	T2	2	Chalk & Talk, PPT , Video, Flipped classroo m
		6.2	Machine Tools and Related Equipment	T2	1	
		6.3	Material Handling Systems	R1	1	
		6.4	Material Requirement Planning	T2, R1	1	
		6.5	Computer control systems	T2	1	
		6.6	Human labor &CIMS Benefits	T2	1	
CBS		6.7	Manufacturing Resource Planning	T2, R1	1	
CBS		6.8	Enterprise Resource Planning	T2, R1	1	
				Total	**09**	
			CUMULATIVE PROPOSED PERIODS		**70**	

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, 2017.
T2	Mikell P. Groover, Automation, Production systems& Computer Integrated Manufacturing, 4th Edition, Pearson Education, 2016.
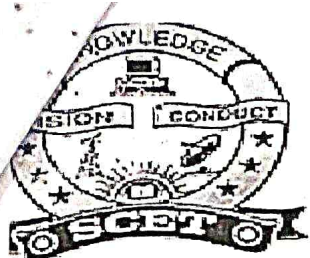
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Reference Books:	
S.No.	**AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION**
R1	P.Radhakrishna,S.Subramanyamm,V.Raju, CAD/CAM/CIM, 3rd Edition, New Age International, 2015.
R2	J. Srinivas, CAD/CAM Principles and Applications, 3rd Edition, Oxford University Press, 2016.
R3	Farid Amirouche, Principles of computer aided design and manufacturing, 2nd Edition, Pearson, 2004.
Web Details	
	https://nptel.ac.in/courses/112/102/112102101/
	https://nptel.ac.in/courses/112/104/112104031/

		Name	Signature with Date
i.	Faculty	Dr. R Sanjeev Kumar	
ii.	Faculty II (for common Course)	Mr. Bulli Raju N	
iii.	Faculty III (for common Course)		
iv.	Course Coordinator	Dr. R Sanjeev Kumar	
v.	Module Coordinator	Dr. Francis Luther King M	
vi.	Programme Coordinator	Dr. A Gopichand	

Principal

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