BBS College of Engineering and Technology Prayagraj
Lecture Plan

Department	Mechanical Engineering Department
Program/Year/Semester/Sec	B.Tech/2025/ **6th**
Course Name/ Course Title	B.Tech/ **CAD/CAM**
Course Code	**BME 602**
Name of Faculty	Mr Saurabh Kumar
Department of Faculty	Mechanical Engineering Dept.

Type of Course	Theory/Lecture
Contact hours	42 hrs

Course Outcomes (COs)	
At the end of this course students will demonstrate the ability to:	
CO1	Able to explain the 2D and 3D transformations, clipping algorithm, Manufacturing models and Metrics.
CO2	Able to explain the fundamentals of geometric modeling, parametric curves, surfaces And Solids.
CO3	Summarize the different types of Standard systems used in CAD.
CO4	Able to apply NC & CNC programming concepts to develop part programme for Lathe & Milling Machines
CO5	Understand the different types of techniques used in Cellular Manufacturing and FMS

Unit	Topic & sub – topic	Topics Covered	COs	Lectures proposed	Lecture delivered	Date	No. of students present (54)	Sign. of faculty
	Unit-1 Introduction:							
	Product cycle- Design process- sequential and concurrent engineering- Computer aided design		CO1	2				
	CAD system architecture- Computer graphics – co-ordinate systems- 2D and 3D transformations homogeneous coordinates		CO1	2				
	Line drawing -Clipping- viewing transformation-Brief introduction to CAD and CAM – Manufacturing Planning, Manufacturing control- Introduction to CAD/CAM –CAD/CAM concepts		CO1	2				
	Types of production– Manufacturing models and Metrics– Mathematical models of Production Performance		CO1	2				
				8				
2	**Unit-2 Geometric modeling:**							
	Representation of curves- Hermite curve- Bezier curve		CO2	2				
	- B-spline curves-rational Curves		CO2	2				
	Techniques for surface modeling – surface patch-Coons and bi-cubic patches-Bezier and B-spline surfaces		CO2	2				
	Solid Modeling techniques-CSG and B-rep		CO2	2				
				8				
3	**Unit-3 Cad standards:**							
	Standards for computer graphics- Graphical Kernel System (GKS)		CO3	2				

			CO					
	standards for exchange images- Open Graphics Library (OpenGL)		CO3	2				
	Data exchange standards–IGES, STEP, CALS etc.		CO3	2				
	–communication Standards		CO3	2				
			CO3					
				8				
4	**Unit-4 Fundamental of CNC and part programming.**							
	Introduction to NC systems and CNC – Machine axis and Co-ordinate system-		CO4	2				
	- CNC machine tools- Principle of operation		CO4	2				
	CNC- Construction features including structure-DrivesandCNCcontrollers-2D and 3D Machining on CNC-Introduction of Part Programming		CO4	2				
	Detailed Manual part programming on Lathe & Milling machines using G code sand M codes-Cutting Cycles,			2				
	Loops, Sub program and Macros- Introduction of CAM package.			2				
				10				
5	**Unit-5 Cellular manufacturing and flexible manufacturing system (FMS)**							
	Group Technology (GT), Part Families–Parts Classification and coding–Simple Problems in Opitz Part Coding system		CO5	2				
	–Production flow Analysis–Cellular Manufacturing–Composite part concept		CO5	3				
	Types of Flexibility–FMS–FMS Components – FMS Application & Benef		CO5	3				
	FMS Planning and Control– Quantitative analysis in FM		CO5	2				
				8				
	Total Lectures			42				

Text Books & References
E Zimmer M Groover. CAD/CAM Computer Aided Design and Manufacturing, Pearson, 2014
V. Rajaraman. Computer Oriented Numerical Methods, PHI Learning, 4th Edition, 2019.
Tiago Franco, Beatriz Costa, Maria Grilo. Product Design Process, Imaginary Cloud Limited, 2019.

Signature of Faculty   Signature of HOD

Comments	