

Lesson Plan
ME 307 Computer Aided Geometric Design (CAGD)

S.No.	Lecture No.	Topic	Completed on	Duration	Contents
	1	Course introduction	August 5, 2024	1.0	
	2	Introduction to CAD, Application of Computational geometry	August 7, 2024	1.0	Status of point in the polygon, containment problems
	3	CAD and Geometric modeling	August 9, 2024	1.0	General discussion on applications and need of CAD, CAD/CAM integration, CAD to CAM, Five axis CNC
	4	Transformations-I	August 16, 2024	1.0	translation, rotation, homogeneous coordinate, scaling, shear, concatenation
	5	Transformations-II	August 19, 2024	1.0	Numerical questions in the class itself
	6	Transformations-III	August 21, 2024	1.5	Rotation and Reflection about an arbitrary line
	7	Transformations-IV	August 23, 2024	1.0	Implementing transformations in MATLAB, Assignment #1: Centroid of an irregular polygon
	8	Programming-I	August 24, 2024	1.5	Collecting Data for polygon plotting and plot,
	9	Programming-II	August 25, 2024	2.0	Line-Line Intersection
	10	Programming-III	August 27, 2024	2.0	Boolean Operation
	11	Projections	August 28, 2024	1.5	Orthographic projection, Isometric, Oblique and perspective projections
	12	Curves Representation, Parametric cubic curve	August 30, 2024	1.5	Parametric representation v/s Implicit/explicit representation, advantages of parametric representation, PC curve in Algebraic and Geometric
	13	PC Curve, Reparametrization of curves	September 2, 2024	1.5	PC Curve Four point form, Reparametrization, truncating, extending, subdividing of curves, composite curves
	14	Bezier curve, Properties of Bezier curves	September 9, 2024	1.0	Bezier curve formulation, representation in matrix form, properties of bezier curve,
	15	Numericals on PC Curve, Quiz 1	September 11, 2024	2.0	Continuity of PC curve and blending of curves
	16	Quiz 2	September 12, 2024	1.0	Parametric representation, transformation, bezier curve
	17	Bezier curve,	September 13, 2024	1.0	Bezier curve blending functions and their properties
	18	Bezier curve, Additional flexibility	September 14, 2024	2.0	Derivatives of Bezier curve, slope and curvature continuity, additional flexibility in bezier curve
	19	Bezier curve, Degree raising	September 16, 2024	1.0	degree raising, de kasteljao algorithm, trimming, blending of bezier curve
		MIDTERM	September 25, 2024	25.5	
	20	B Spline	October 4, 2024	1.5	local control of B spline curve, knot vectors
	21	B Spline	October 6, 2024	1.5	Periodics and Open uniform knot vectors
		B Spline	October 7, 2024	1.0	Non uniform knot vectors
	22	Non Uniform Rational B-spline (NURB)	October 8, 2024	2.0	NURBS, Representation of conic sections, advantages and applications
	23	Surface 1	October 14, 2024	1.0	Surface of revolution and sweep surface
	24	Surface 2	October 15, 2024	1.5	Picewise representation of spherical and quadrilateral surfaces
	25	Surface 3	October 16, 2024	1.0	Surface Mapping, Bezier and B-Spline surfaces
	26	Surface 4	October 21, 2024	1.0	Sixteen point form, Surface reparametrization. Subdivision, surface on the curve, surface -surface intersection
	27	Advanced Topic, Shape Grammar	October 22, 2024	1.0	Geometric Modeling using Point Clouds, Shape Grammar and the generation of the designs.
	28	Properties of curves and surfaces	October 22, 2024	1.0	Analytical properties of Curves and Surfaces, Relational Properties of Curves and Surfaces
	29	CAD/CAM Data Exchange.	October 22, 2024	1.0	Need of data exchange, Data exchange between various cad systems, file formats, IGES file structure
	30	Solid 1	November 4, 2024	1.5	Solid Modeling Fundamentals: Mathematical Models of Solids, Evaluation of some methods of Geometric Modeling, Constructive Solid Geometry,
		Solid 2	November 5, 2024	1.5	regularized set operations, Boundary Representation, volume decomposition.
	26	Project 1	November 18, 2024	1.5	
	27	Project 2	November 19, 2024	1.5	
				19.5	
		Grand Total		45.0	