ME308 COMPUTER AIDED DESIGN AND ANALYSIS 3-0-0-3 2016 Prerequisite: ME201 Mechanics of solids Course Objectives: 1 1 To impart basic knowledge on Computer Aided Design methods and procedures 2 7 1 To introduce the fundamentals of solid modelling 3 0 0 1 To introduce the fundamentals of solid modelling 3 0 0 0 1 To introduce the concepts of finite element analysis procedures. Syllabus 1 To introduce the concepts of finite element analysis procedures. Syllabus 1 Introduction to CAD/CAM, Basics of geometric and solid modeling, transformation, representatio points, lines, surfaces and solid models. Introduction to finite element analysis, solution procedures interpolation, isoparametric formulation, applications. Expected outcome: 1 0 1 <td< th=""><th>Course code</th><th>Course Name</th><th>L-T-P- Credits</th><th>Year of Introduction</th></td<>	Course code	Course Name	L-T-P- Credits	Year of Introduction
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Course Plan				
Module	le Contents		End Sem. Exam	
	A DI A RIDI II VALA	NA	Marks	
Ι	Introduction to CAD, Historical developments, Industrial look at CAD, Comparison of CAD with traditional designing, Application of computers in Design	action to CAD, Historical developments, Industrial look at CAD, arison of CAD with traditional designing, Application of 2 ters in Design		
	Basics of geometric and solid modeling, Packages for CAD/CAM/CAE/CAPP		15%	
	Hardware in CAD components, user interaction devices, design database, graphic Standards, data Exchange Formats, virtual Reality.	4		
п	Transformation of points and line, 2-D rotation, reflection, scaling and combined transformation, homogeneous coordinates, 3-D scaling.	4		
	Shearing, rotation, reflection and translation, combined transformations, orthographic and perspective projections, reconstruction of 3-D objects.	3	15%	
	FIRST INTERNAL EXAM			
III	Algebraic and geometric forms, tangents and normal, blending functions, reparametrization, straight lines, conics, cubic splines, Bezier curves and B-spline curves.	4	15%	
	Plane surface, ruled surface, surface of revolution, tabulated cylinder, bi- cubic surface, bezier surface, B-spline surfaces and their modeling techniques.	3		
IV	Solid models and representation scheme, boundary representation, constructive solid geometry.		15%	
	Sweep representation, cell decomposition, spatial occupancy enumeration, coordinate systems for solid modeling.	4		
SECOND INTERNAL EXAM				
V	Introduction to finite element analysis - steps involved in FEM- Preprocessing phase – discretisation - types of elements	2		
	Formulation of stiffness matrix (direct method, 1-D element) - formulation of load vector - assembly of global equations - implementation of boundary conditions - solution procedure - post processing phase	3	20%	
	Simple problems with axial bar element (structural problems only)	2		
VI	Interpolation – selection of interpolation functions - CST element - isoparametric formulation (using minimum PE theorem) – Gauss- quadrature	4	20%	

	Solution of 2D plane stress solid mechanics problems (linear static analysis) 3
I	END SEMESTER EXAM
	AD A Poly Paper Pattern A L A M
Maximum	marks: 100 Time: 3 hrs
The question	on paper should consist of three parts
Part A	UNIVERSITY
There shou	ald be 2 questions each from module I and II
Each quest	tion carries 10 marks
Students w	vill have to answer any three questions out of $4 (3X10 \text{ marks} = 30 \text{ marks})$
Part B	
There shou	ald be 2 questions each from module III and IV
Each quest	tion carries 10 marks

Estd

2014

Part C

There should be 3 questions each from module V and VI Each question carries 10 marks Students will have to answer any four questions out of 6 (4X10 marks =40 marks)

Students will have to answer any three questions out of 4 (3X10 marks = 30 marks)

Note: Each question can have a maximum of four sub questions, if needed.