



# NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

## DEPARTMENT OF PRODUCTION ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech Production Engineering		
Course Title	COMPUTER AIDED DESIGN AND ENGINEERING (Theory & Lab)		
Course Code	PRPC26	No. of Credits	3
Course Code of Pre-requisite subject(s)	CSIR11 Basics of Programming (Theory & Lab)		
Session	January 2020	Section (if, applicable)	A
Name of Faculty	V.Murugabalaji	Department	Production Engineering
Official Email	murugabalaji@nitt.edu	Telephone No.	9597675365
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		Telephone No.	
Course Type (please tick appropriately)	<input checked="" type="checkbox"/> Core course	<input type="checkbox"/> Elective course	
<b>Syllabus (approved in BoS)</b>			
<p>Fundamentals of computer - configurations - workstations - data communications - input/output devices, display technology, CAD software. Interactive graphics - point plotting techniques.</p> <p>Transformations techniques, viewing operations: window, viewport and clipping, visual realism Hidden line/surface removal, shading and colour models. Computer drafting through high level languages.</p> <p>Geometric modeling: Wireframe modeling, Surface modeling: Representation of curves and surfaces, design of curves: cubic splines, bezier curves and B spline, design of surfaces.</p> <p>Solid modeling: Constructive solid geometry (C-rep) and Boundary representation (B-rep). Graphics standards: GKS, DXF and IGES standards - Parametric design programmes.</p> <p>Finite element modeling and analysis: types of analysis, degrees of freedom, element and structure- stiffness equation, assembly procedure. Database concepts and data base management systems - SQL.</p>			
<b>COURSE OBJECTIVES</b>			
<ol style="list-style-type: none"> <li>1. To understand various hardware and software that serve as components of CAD system.</li> <li>2. To understand plotting, transformations techniques, geometric modeling.</li> <li>3. To understand graphic standards, finite element modeling and DBMS.</li> </ol>			
<b>MAPPING OF COs with POs</b>			
Course Outcomes	Programme Outcomes (PO)		
1. Summarize the concepts and applications of CAD.	1,4,6		



2. Elaborate fundamental of computers, networks, transformations techniques, geometric modeling solid modeling and finite element modeling	1,4,6
3. Distinguish various concepts and techniques used for Product design and to develop product design skills.	1,4,6

COURSE PLAN – PART II			
COURSE OVERVIEW			
<p>Computer aided design and Engineering is an important tool used to create virtual 3D objects and perform analysis on 3D CAD model. This tool offers more design freedom to model the complicate shapes and provides brief introduction about finite element methods and its applications.</p> <p>This course enables students to understand various techniques used in CAD modelling and Finite element modelling.</p>			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No	Week/Contact Hours	Topic	Mode of Delivery
1	1 / 3hrs	Fundamentals of computer - configurations - workstations - data communications - input/output devices, display technology, CAD software and lab practice	C&T/ PPT
2	2 / 3hrs	Interactive graphics - point plotting techniques and lab practice	C&T/ PPT
3	3 / 3hrs	Transformations techniques and lab practice	C&T/ PPT
4	4 / 3hrs	viewing operations: window, viewport and clipping, visual realism and lab practice	C&T/ PPT
5	5 / 3hrs	Hidden line/surface removal, shading and colour models. Computer drafting through high level languages and lab practice	C&T/ PPT
6	6 / 3hrs	Geometric modeling: Wireframe modeling, S u r f a c e modeling: Representation of curves, design of curves cubic splines, bezier curves and B spline, Representation of curves and surfaces and lab practice	C&T/ PPT
7	7 / 3hrs	Time study and production study Representation of surfaces and design of surfaces and lab practice	C&T/ PPT



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8	8 / 3hrs	Solid modeling: Constructive solid geometry (C-rep) and Boundary representation (B-rep) and lab practice	C&T/ PPT
9	9 / 3hrs	Graphics standards: GKS, DXF and IGES standards - Parametric design programmes and lab practice	C&T/ PPT
10	10 / 3hrs	Finite element modeling and analysis: types of analysis, degrees of freedom, element and structure- stiffness equation, assembly procedure and lab practice	C&T/ PPT
11	11 / 3hrs	Database concepts and data base management systems – SQL and lab practice	C&T/ PPT
12	12 / 3hrs	lab practice	C&T/ PPT

### COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test 1	4 <sup>th</sup> week	1 hr	20%
2	Cycle Test 2	8 <sup>th</sup> week	1 hr	20%
3	Assignment	Once in 4 Week		10%
CPA	Compensation Assessment*	10 <sup>th</sup> week	1 hr	20%
4	Lab Practice	During regular lab practice		20%
5	Final Assessment *	12 <sup>th</sup> week	3 hr	30%

\*mandatory; refer to guidelines on page 4

### COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

- Course exit survey will be collected at the end of the semester
- Feedback during class committee meeting

### COURSE POLICY (including compensation assessment to be specified)

- Attending classes regularly and continuously is required for the students to understand the concepts.
- Attendance will be taken in every class. If the student is not able to maintain 75%





**Guidelines**

- a) The number of assessments for any theory course shall range from 4 to 6.
- b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.
- c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.
- d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

- e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.
- f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.
- g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.