TCET/FRM/IP-02/09

Semester Plan
(Theory)

Revision: A

Semester: VII

Course: Mech

Subject: MEC702: CAD / CAM /CAE

Class: BE Mech B

S.No.	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning	Recommended Sources
1	Basic knowledge of Machine Design and Mathematics	2 hours	Self Learning/ Revision	**Textbooks:** 1. Design of Machining element by V B Bhandari 2. Mathematics

Class Room Teaching

Sr. No	Module No.	Lesson No	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1	SOP 1		SOP-Theory	Power point presentation, Chalk & Board	10-07-2017		
2	SOP 2		SOP-Practical	Power point presentation	11-07-2017		
3	SOP 3		SOP-OBE	Chalk & Board, Animation	12-07-2017		
4	Module 1	L 1.1	Computer Graphics: Two dimensional computer graphics, vector generation, the windowing	Chalk & Board, Animation	17-07-2017		
5	Module 1	L 1.2	Three dimensional Computer graphics, viewing transformation, Homogeneous coordinates,	Chalk & Board, Animation	19-07-2017		
6	Module 1	L1.3	Hidden line removal & hidden surface removal algorithm, light & shade ray tracing	Chalk & Board, Animation	20-07-2017		
7	Module 1	L1.4	The parametric representation of geometry, Bezier curves, Cubic Spline curve,	Chalk & Board, Animation	21-07-2017		
8	Module 1	L 1.5	B-Spline curve, parametric representation of line, circle, ellipse & parabola	Power point presentation, Chalk & Board	21-07-2017		
9	Module 1	L 1.6	Constructive solid geometry (CSG), Boundary Representation (B-Rep)	Chalk & Board, Animation	24-07-2017		
10	Module 1	L1.7	Wire Frame Modeling, Solid Modeling,	Chalk & Board, Animation	25-07-2017		
11	Module 1	L1.8	Surface Modeling, Parametric Modeling, feature based modeling, Feature recognition, Design by feature	Chalk & Board, Animation	26-07-2017		
12	Module 2	L2.1	2D & 3D Transformations (Translation, Rotation, & Scaling & Magnification),	Chalk & Board, Animation	27-07-2017		
13	Module 2	L2.2	Concatenations, Matrix representation, Problems	Power point presentation, Chalk & Board	31-07-2017		
14	Module 2	L 2.3	object oriented programming on Transformations	Chalk & Board, Animation	01-08-2017		
15	Module 2	L 2.4	Object transformation, mirror transformation	Chalk & Board, Animation	02-08-2017		
16	Module 2	L 2.5	problems for 2D	Chalk & Board, Animation	03-08-2017		

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17	Module 2	L 2.6	problems for 3D	Chalk & Board, Animation	03-08-2017		
18	Module 2	L 2.7	Artificial Intelligence in Design & Manufacturing,	Power point presentation, Chalk & Board	07-08-2017		
19	Module 2	L 2.8	Representation of Knowledge, and Knowledge base Engineering.	Chalk & Board, Animation	07-08-2017		
20	Module 3	L 3.1	Tape coding & format, Manual Part Programming, Computer Aided Part Programming	Chalk & Board, Animation	08-08-2017		
21	Module 3	L 3.2	CNC functions & advantages, DNC, adaptive Control, CNC programming	Chalk & Board, Animation	09-08-2017		
22	Module 3	L 3.3	Trends & new developments in NC, Part programmers job, functions of a post processor, NC part programming languages	Chalk & Board, Animation	10-08-2017		
23	Module 3	L 3.4	CNC programming - turning	Power point presentation, Chalk & Board	14-08-2017		
24	Module 3	L 3.5	CNC programming - milling	Chalk & Board, Animation	16-08-2017		
25	Module 3	L 3.6	Elements of a APT language, The Macro Statement in APT, NC programming with interactive graphics	Chalk & Board, Animation	16-08-2017		
26	Module 3	L3.7	Constructional details of CNC machines, Feedback devices- Velocity & displacement, Machining Centers and its types	Chalk & Board, Animation	24-08-2017		
27	Module 3	L 3.8	Automated Material Handling & storage Systems like Robots, AGVs and AS/RS etc	Chalk & Board, Animation	30-08-2017		
28	Module 4	L 4.1	Fundamentals of computer aided engineering, CAE includes mass property calculations,	Power point presentation, Chalk & Board	31-08-2007		
29	Module 4	L 4.2	problems based on previous problem	Chalk & Board, Animation	04-09-2017		
30	Module 4	L 4.3	kinematic analysis and animation (movement, visualization, simulation and FEA).	Chalk & Board, Animation	05-09-2017		
31	Module 4	L 4.4	Case study based on modeling and analysis of structural, thermal/fluid, and dynamic (vibration analysis) system	Chalk & Board, Animation	06-09-2017		
32	Module 4	L 4.5	problems based on previous problem	Chalk & Board, Animation	07-09-2017		
33	Module 4	L 4.6	problems based on previous problem	Chalk & Board, Animation	07-09-2017		
34	Module 4	L 4.7	Parameter optimization.	Chalk & Board, Animation	11-09-2017		
35	Module 4	L 4.8	Problems on Parameter optimization	Chalk & Board, Animation	12-09-2017		
36	Module 5	L 5.1	Computer Integrated Manufacturing & Technology Driven Practices Introduction, Evolution,	Chalk & Board, Animation	13-09-2017		
37	Module 5	L 5.2	CIM Hardware and Software,	Chalk & Board, Animation	14-09-2017		
38	Module 5	L 5.3	CIM Benefits, Nature and role of the elements of CIM	Chalk & Board, Animation	18-09-2017		
39	Module 5	L 5.4	Identifying CIM needs, Data base requirements of CIM	Power point presentation, Chalk & Board	18-09-2017		

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40	Module 5	L 5.5	Role of CAD/CAM in CIM, Obstacles to Computer Integrated Manufacturing.	Chalk & Board, Animation	19-09-2017		
41	Module 5	L 5.6	Concept of the future CIM systems, Socio -techno- economic aspects of CIM	Chalk & Board, Animation	20-09-2017		
42	Module 5	L 5.7	case study based on CIM	Chalk & Board, Animation	20-09-2017		
43	Module 5	L 5.8	case study based on CIM	Chalk & Board, Animation	21-09-2017		
44	Module 6	L 6.1	Introduction to RP, Technology Description, Overview of RP, Benefits and Application. RP	Chalk & Board, Animation	25-09-2017		
45	Module 6	L 6.2	Process overviews, STL file Generation, Classes of RP systems:	Power point presentation,	26-09-2017		
46	Module 6	L 6.3	Stereo-lithography Approach (SLA), SLA with photo-polymerization (mathematical modelling of the process)	Chalk & Board, Animation	03-10-2017		
47	Module 6	L 6.4	SLA with liquid thermal polymerization, Selective Laser	Chalk & Board, Animation	04-10-2017		
48	Module 6	L 6.5	Laser powder forming. Prototype properties:	Chalk & Board, Animation	05-10-2017		
49	Module 6	L6.6	Material properties, colour, dimensional accuracy, stability, surface finish, machinability,	Chalk & Board, Animation	12-10-2017		
51	Module 6	L 6.7	RP Applications: Design, Concept Models, Form & fit checking, Functional testing, CAD data	Chalk & Board, Animation	12-10-2017		
52	Module 6	L 6.8	RP processes for MEMS, Photolithography, Direct Laser Writer, Bulk Lithography for 3D micro fabrication (Modelling of beam	Chalk & Board, Animation	16-10-2017		
Remark:		Syllabus Coverage:		Practice Session: 2		**Content Beyond Syllabus:**	
Course:							
No. of (lectures planned)/(lecture taken): 52							
Advanced course: Manufacturing system I and II				20 Hours	Online NPTEL videos with Hands on Training in Laboratory	**Web sources:** 1. NPTEL-https://onlinecourses.nptel.ac.in 2. www.tutorialpoint.com1. Instructor's study material, **Textbook reference:**"CAD/CAM Principles, Practice and Manufacturing Management" by Chris McMahon, Jimmie Browne, Pearson	

Text Books:

1. "Cad/Cam Theory and Practice by Ibrahim Zeid, McGraw – Hill
2. CAD/CAM/CIM by P Radhakrishna, New Age Publication

References:

1. CAD/CAM Automation by Farazdak Haideri
2. "Mathematical Elements for Computer Graphics", Rogers D F I and Adams J A,Mc Graw-hill
3. "Principle of Computer Graphics" by William .M. Neumann and Robert .F. Sproul,McGraw Hill book of singapore.

Digital Reference:

1 www.nptel.ac.in

2 www.tutorialpoint.c

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Raheshwari Jaisinghani Dr. Siddesh Siddappa Dr. R.R.Sedambkar

Name & Signature of Faculty Signature of HOD Signature of Principal /Dean (Academics)

Date: Date: Date:

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.