

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

**Course Title: Computer aided Machine Drawing
(Code: 3331906)**

Diploma Programme in which this course is offered	Semester in which offered
Mechanical Engineering	III

1. RATIONALE:

The students of mechanical engineering programme are mainly involved in drafting, Manufacturing, inspection and planning activities (such as preparing process plans, Preparing bill of materials, etc.) at industries. For all such activities, reference document is the drawing of components/assemblies to be manufactured. In this context, it is of utmost importance to prepare, read and interpret these drawings correctly for production of components and assemblies accurately and precisely. The industrial practices of drafting are also important for the students to make them aware of drafting practices, symbols, codes, norms and standards generally used in industries. Development of sketching ability also strengthens effective engineering communication & presentation.

Now a days in industry the production drawings are created using CAD software.

2. COMPETENCY

- Prepare production drawings using codes, norms and standards through Computer Aided Drafting software.

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
0	0	4	4	0	0	40	60	100

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

Note: It is the responsibility of the institute heads that marks for **PA of theory & ESE and PA of practical** for each student are entered online into the GTU Portal at the end of each semester within the dates specified by GTU.

4. COURSE DETAILS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I Introduction	1 Identify drafting, tolerance and geometrical symbols in given production drawings. 2. Appreciate AutoCAD (Mechanical) environment in context to production drawings.	1.1 Basic knowhow of computer hardware, software and peripherals. 1.2 Concept and need of machine drawings. 1.3 Drafting, tolerance and geometrical symbols used in machine drawing. 1.4 AutoCAD (Mechanical) screen, library, symbols, templates in context of machine drawing. 1.5 Drawing standards.(IS-696 /SP 46) (Drawing/ printing/ storage).
Unit – II 2D Production Drawings	2. Prepare and plot 2D production machine drawings using AutoCAD.	2.1 Simple 2D production drawings of 6-7 mechanical components made up of minimum 5-6 manufacturing operations using AutoCAD (Mechanical). 2.2 2D assembly production drawing of any one simple mechanical assembly having minimum 5-6 components each made up of 5-10 manufacturing operations using AutoCAD (Mechanical). 2.3 Take print outs of above drawings using printer/plotter.
Unit – III 2D Parametric Drawings	3. Prepare 2D parametric drawings of simple machine components using Pro/E or Solid Edge or Solid Works.	3.1 Concept and examples of parametric and non parametric models. 3.2 Concept, examples and applications of constraints and relations. 3.3 Simple 2D parametric drawings of 6-7 machine components made up of minimum 5-6 manufacturing operations each using sketcher mode.
Unit – IV Project Work	4. Prepare assembly drawing of mechanical components with codes, standards and symbols using CAD software.	4.1 Prepare one assembly drawing having 4-5 mechanical components, draw orthographic projections of each component with Institute template and take print out of it. (group of 5-7 students)

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS

Unit	Unit Title	Teaching Hours	Practice Hours	Distribution of Marks			
				R Level	U Level	A Level	Total Marks
I	Introduction	0	08	Not Applicable			
II	2D Production Drawings	0	20				
III	2D Parametric Drawings	0	14				
IV	Project Work	0	14				
Total		0	56				

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as only general guideline for students and teachers. The actual distribution of marks in the question paper may vary from above table.

6. LIST OF EXERCISES.

Ex. No.	Unit No.	Practical/Exercise	Approx. Hrs. Required
1	I	a. Identify parts of computers. Recall basic knowledge to use computers. Use input devices. b. Student will prepare a report in tabular form on following. i. All parts of computer, specifications and uses of each part (Namely keyboard, mouse, monitor, processor, RAM, SMPS, Motherboard, etc.)	4
2	II	a. Prepare orthographic production drawings of 6-7 mechanical components (Minimum two should be based on real industrial components selected by student as student activity) each made up of minimum 5-6 manufacturing operations using AutoCAD. Also take print outs of the same. b. Student will prepare report on following. i. Select at least two mechanical components (approved by teacher). Sketch them with dimensions. ii. Write steps to prepare each drawing. Steps must include followings. A. Sketch of components at each step with dimensions. B. Sequence of commands with name, options and values for each command.	16
3	III	Draw production drawing of at least one assembly and take print outs of the same. a. Prepare assembly drawing made up of 5-6 mechanical components using AutoCAD and Take print out of it b. Student will prepare report on following i. Select mechanical assembly (approved by teacher). Measure and draw them with dimensions. ii. Write steps to prepare each drawing. Steps must include followings. A. Sketch of each components and assembly for the same. B. Sequence of commands with name, options and values for each command.	14
4	IV	a. Prepare 2D parametric drawings of 6-7 mechanical components (Minimum two should be based on physical components selected by student as student activity) each made up of minimum 5-6 manufacturing operations using Pro/E(Creo)/Solid Edge/Solid Works.	08

Ex. No.	Unit No.	Practical/Exercise	Approx. Hrs. Required
		<p>Also take print outs of the same.</p> <p>b. Student will prepare report on following.</p> <p>i. Select at least two mechanical components. (Approved by teacher). Sketch them with dimensions.</p> <p>ii. Write steps to prepare each drawing. Steps must include followings.</p> <p>A. Sketch of components at each step with dimensions.</p> <p>B. Sequence of commands with name, options and values for each command.</p>	
5	V	<p>Prepare given Project in group of 5-7 students using AutoCAD or Pro/E/Solid Edge/Solid Works</p> <p>a. Identify various parts of given Project</p> <p>b. Student will prepare report on following</p> <p>i. Measure dimension of parts and draw their sketch.</p> <p>ii Make drawing template and make orthographic views of assembly using same.</p> <p>iii Annotate different view of assembly with tolerance and surface parameter if any and take print out of it.</p>	14

NOTES:

a: It is compulsory to perform students' activities.

b: Submission includes objects, parts/assembly, print outs of drawings prepared, reports and student activities performed. (Term work must not include any photocopy/ies, printed manual/pages, litho, etc. It must be hand written/hand drawn by student only.)

c: The components and assembly for production drawing must be varied for each student in batch so that each student will have different problem.

d: Keep "Westernmann Table" (Revised to Indian Standards, New Age International Publishers) during practice periods.

e: For 40 marks under Practical Marks ESE, students are to be assessed for competencies achieved. Students are to be given data for practical ESE to:

i. Prepare production drawings using AutoCAD and Pro-E software.

ii. Interpret given production drawing/s.

iii. Refer and interpret data from data book/codes/standards/ Westernmann Table.

7. SUGGESTED LIST OF STUDENT ACTIVITIES

SR.NO.	ACTIVITY.
1	Select at least two simple mechanical components each made up of minimum 5-6 manufacturing operations. Get them approved by teacher. Measure and sketch them in report pages with dimensions.
2	Select at least two simple mechanical assemblies each made up of minimum 5-6 manufacturing operations. Get them approved by teacher. Measure and sketch them in report pages with dimensions.
3	Bring Actual assembly from workshop/Industry and measure dimensions and make 2D Parametric drawings for the same.

8. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr. No.	Title of Books	Author	Publication
1	Machine Drawing including AutoCAD	Ajeet Singh	McGraw hill
2	Production Drawing	K L Narayan	New Age Publication
3	Fundamental of Geometric Tolerance and dimensioning	Alex Krulikowski	Cengage Learning
4	Engineering Graphics with AutoCAD	Sarkar .A.K	PHI india
5	Essentials of Engineering Drawing and Graphics using AutoCAD	Jeyapoovan	Vikas publication
6	Pro Engineer Wildfire 5.0 For Engineers And Designers	Sham Tickoo	Dream Tech press
7.	AutoCAD User Guide	Autodesk	Autodesk Press.

B. List of Major Equipment/Materials

1. CAD Workstation.
2. 24" Colour or B/W Plotter.
3. LaserJet Printer.

C List of Software/Learning Websites

1. Autodesk AutoCAD Mechanical (Educational network licensed latest Version)
2. Pro/Engineer or Solid edge or Solid Works (Educational network licensed latest Version)

D. Learning Websites

1. Autodesk Exchange/ AUGI
2. PTC University Tutorials
3. Video Tutorials from YouTube

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE**Faculty Members from Polytechnics**

1. Prof. S.H.Sundarani
2. Prof. J.B.Patel
3. Prof. J.M.Patel
4. Prof. D.B.Patel
5. Prof. T.B.Patel

Coordinator and Faculty Members from NITTTR Bhopal

1. Prof. Sharad K. Pradhan
2. Prof. C.K. Chug
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