

14.2.0 TECHNICAL DRAWING II

14.2.01 INTRODUCTION

The areas covered in this unit are; applied geometry, design and working drawing. It is a support subject for all technical craft courses. It is expected that trainee will communicate ideas within a selected field and correctly interpret drawings. Throughout the course, emphasis will be given to accuracy, neatness and good line work as this habit will influence accuracy in setting out practical tasks in selected fields. The International Organization of Standardization (S.I units) and conventions will be used throughout the subject.

14.2.02 GENERAL OBJECTIVES

By the end of this module unit, the trainee will be able to:

- a) communicate ideas through the use of sketches and scaled drawings
- b) read and interpret working drawings
- c) set out practical work from a given sketch or scaled working drawings
- d) accommodate new technological changes in drawings.

14.2.03 SUMMARY TABLE AND TIME ALLOCATION

TECHNICAL DRAWING II

Code	Sub-Module Unit	Content	Time Hrs
14.2.1	Plane Geometry	<ul style="list-style-type: none">• Loci• Helix• Lines in space and lamina	12
14.2.2	Solid Geometry	<ul style="list-style-type: none">• Interpenetration• Surface development	12
14.2.3	Principles of Design Engineering	<ul style="list-style-type: none">• Principles of design• Design projects	12
14.2.4	Mechanical Fasteners	<ul style="list-style-type: none">• Screw threads• Fasteners	10
14.2.5	Mechanical Engineering Drawing	<ul style="list-style-type: none">• Orthographic views of assembled drawings	10

		<ul style="list-style-type: none"> • Dimensioning assembly drawing • Assembly of exploded • Preparation of parts lists 	
14.2.6	Introduction to CADD (Computer Aided Design and Drafting)	<ul style="list-style-type: none"> • Computer graphics • CADD equipment • CADD materials • Problems dealing with CADD 	10
Total Time			66

14.2.1P	PLANE GEOMETRY II	<ul style="list-style-type: none"> ii) construct single and double cylindrical helices iii) construct lines in space and lamina
14.2.1P0	Specific Objectives By the end of the sub-module unit, the trainee should be able to:	<i>Content</i>
	a) construct locus point of sliding and rotating mechanisms	14.2.1P1 Construction of Loci i) sliding and rotating mechanism ii) cycloid and epic cycloid
	b) construct a helix given the dimensions	14.2.1P2 Construction of Helix i) single line cylindrical helix ii) double line cylindrical helix
	c) determine the true length of lines in space and lamina	14.2.1P3 Lines in space and lamina i) planes ii) projection of points and lines iii) true length of lines iv) true shapes
14.2.1C	<i>Competence</i> The trainee should have the ability to: i) construct given loci of mechanisms	

	<i>Suggested Learning Resources</i>		
	- Overhead projector		iv) cylinder to triangular prism
	- Models of mechanisms	14.2.2P2	v) cone to cone
	- Transparencies		Surface development
	- Charts		i) development of cylinder to cylinder
	- Industrial visits		ii) development of cylinder to cone
14.2.2P	SOLID GEOMETRY II		iii) development of cylinder to triangular prism
14.2.2P0	<i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to:		iv) development of cone to cone
	a) project the points of intersecting solids		
	b) develop surfaces of intersecting solids		
14.2.2C	<i>Competence</i> The trainee should have the ability to project the points of intersecting solids develop surfaces of intersecting solids		<i>Suggested Learning Resources</i>
			- drawing instruments and equipment
			- cylindrical and conical models
			- transparencies
			- overhead projector and slides
		14.2.3P	PRINCIPLES OF ENGINEERING DESIGN
14.2.2P1	<i>Content</i> Interpenetration	14.2.3P0	<i>Specific Objectives</i> By the end of the sub-module unit, the trainee should be able to:
	i) cylinder to cylinder		a) state the principles of design
	ii) cylinder to cone		
	iii) cylinder to pyramid		

	b) design simple and functional objects		video, slides - transparencies
14.2.3C	<i>Competence</i> The trainee should have the ability to: i) state design principles ii) design simple functional objects	14.2.4	MECHANICAL FASTENERS
		14.2.4P0	<i>Specific Objectives</i> By the end of the sub module unit, the trainee should be able to: a) draw different types of thread forms b) draw different types of fasteners
14.2.3P1	<i>Content</i> Problem statement -restrictions -research -processing -solution/planning -evaluation		
14.2.3P2	Design of functional objects i) paper punch ii) stool iii) arches iv) sprinklers v) vehicle reflector vi) bottle opener vii) hand tools viii) gates ix) jigs x) wheel barrows	14.2.4C	<i>Competence</i> The trainee should have the ability to: i) draw different types of thread forms ii) draw different types of fasteners
		14.2.4P1	<i>Content</i> Screw thread forms i) metric thread ii) square thread iii) buttress thread iv) ACME thread
	<i>Suggested Learning Resources</i> - drawing instruments and equipment - computer soft wares - overhead projector	14.2.4P2	Fasteners i) bolts/nuts ii) rivets iii) pins iv) clips v) washers

	<i>Suggested Learning Resources</i>		prepare a parts list
	- various fasteners		
	- various screw thread forms	14.2.5P1	<i>Content</i> Sectional views
	- relevant textbooks		- cutting plane
	- charts	14.2.5P2	- hatching
14.2.5	MECHANICAL ENGINEERING DRAWING		Dimensioning assembly drawing
			i) ballooning
			ii) dimension lines
			iii) leader lines
14.2.5P 0	Specific Objectives By the end of the sub module unit, the trainee should be able to:		iv) correct arrow heads
	a) draw sectional views of assembly drawing	14.2.5P3	v) projection lines
	b) dimension assembly drawing		vi) centre lines
	c) assemble exploded machine parts	14.2.5P4	Assemble exploded machine parts
	d) prepare parts list		- clapper box
			- tail stock
			- carburettor
14.2.5C	<i>Competence</i> The trainee should have the ability to		Parts list
	i) draw sectional views of assembly drawing		- item numbers
	ii) dimension assembly drawing correctly		- description of parts
	iii) assemble exploded machine parts		- materials
			- number of parts
			<i>Suggested Learning Resources</i>
			- drawing instruments and equipment
			- samples of machine parts
			- overhead projector/slides

	- transparencies - charts		reference to drawing name various CADD equipment
14.2.6	INTRODUCTION TO COMPUTER AIDED DESIGN AND DRAFTING (CADD)		ii) use different CADD materials iii) produce geometrical constructions and object drawings using CADD equipment
	Practice		
14.2.6P	<i>Specific Objectives</i> By the end of the sub module unit, the trainee should be able to:		
	a) explain computer graphics with reference to drawing	14.2.6P	<i>Content</i> Computer graphics straight line colour animation
	b) name various CADD equipment	14.2.6P2	CADD equipment - monitor - input devices - storage - software
	c) explain the use of different CADD materials	14.2.6P3	CADD materials i) drawing media ii) drawing pens iii) storage media iv) magnetic disks v) magnetic tape vi) optical disc vii) Solving an engineering problem
	d) produce geometrical constructions and drawings using CADD equipment		
14.2.6C	<i>Competence</i> The trainee should have the ability to:		
	i) explain computer graphics with	14.2.6P4	Geometrical constructions and object drawing using CADD i) circle

- ii) ellipse
- iii) polygon
- iv) rectangle
- v) tangencies
- vi) multiview and
- vii) auxiliary
views

Suggested Learning

Resources

- computers and
software
models
- relevant
textbooks

easyvet.com