

COURSE TITLE	: TOOL ENGINEERING DRAWING -1
COURSE CODE	: 3042
COURSE CATEGORY	: B
PERIODS/WEEK	: 6
PERIODS/SEMESTER	: 108
CREDITS	: 4

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Basic Fastening Devices, Rivetted joints, Limits, Fits and Tolerance, Surface finish	34
2	Assembly and Detailed drawing	24
3	Jigs	25
4	Fixtures	25
	Total	108

OBJECTIVES

Upon the completion of the study of the subject, the student should be able to:

MODULE– I

1.1.0 Appreciate Fastening devices

- 1.1.1 Identify the basic fastening devices
- 1.1.2 Draw the standard thread profiles
- 1.1.3 Draw the standard Hexagonal nut
- 1.1.4 Draw Hexagonal Headed Bolt
- 1.1.5 Draw bolted joints
- 1.1.6 Draw joints using Allen Screw, Grub Screw
- 1.1.7 Draw Locking Nuts
- 1.1.8 Draw riveted joints
- 1.1.9 Calculate the pitch and arrangements of rivet in rows
- 1.1.10 Select fastening devices
- 1.1.11 Select fastening devices for a given work

1.2.0 Riveted Joints

- 1.2.1 Calculate pitch and arrangement of rivet in rows (lap and butt joint).

1.2.3 Dimension to obtain a fit as per BIS

- 1.3.1 Define limits, fits & tolerances
- 1.3.2 Select dimension from standards to give different types of fit for a given mating part Simple problems with examples . Familiarization of tables
- 1.3.3 Identify standard symbols to represent surface finishing
- 1.3.4 Locate the appropriate symbol in drawing
- 1.3.5 Compute fit and tolerance from tables
- 1.3.6 Identify the standard symbols to represent surface finish
- 1.3.7 Locate the appropriate symbols in drawing

MODULE II

- 2.1.0 Create assembly and detailed drawing

- 2.1.1 Select the appropriate size of the sheet for preparing a required assembly/detailed

drawing

- 2.1.2 List the sequence of steps for preparing assembly/detailed drawing
- 2.1.3 Create assembly drawings given the drawings of components such as too maker's clamps, and equalizing clamp
- 2.1.4 Create detailed drawings given the assembly drawings such as clamps, couplings, turn buckle and equalizing clamp
- 2.1.5 Construct the parts list
- 2.1.6 Conventional representation of machine parts

MODULE III

3.1.0 Recognize the various elements of Jigs

- 3.2..1 Distinguish between various types of bushes and locating pins and clamping devices
- 3.2.2 Draw the detailed views of jigs like plate jig, box jig and index jig
- 3.2.3 Draw each parts drawing production manner and prepare bill of material (Three type jigs)

MODULE IV

4.1.0 Recognize the various elements of Fixture and its principles

- 4.1.1 Draw the detailed views of Fixtures for turning, milling, grinding, broaching
Assembled and dismantled drawing

CONTENT DETAILS

MODULE I

BASIC FASTENING DEVICES

Temporary and permanent fastening devices – standard thread profiles – areas of application of Bolts,

Nuts, Screws (Allen Screw and Grub Screw only) – different types of Bolted joints and screw joint for different applications – purpose of locking nuts – types of lock nuts – types, proportions and specifications of rivet – different types of riveted joints – calculations of pitch and arrangement of rivets in rows.

Exercise in drawing Bolted Connections Using Standard Proportions – Exercise in drawing Riveted

joints using Standard Proportions – Exercise in the Selection of appropriate fastening devices to meet the given working conditions.

Draw lap joint one draw, two draw – Butt joint – Single cover – Double cover – Claculation of pitch and arrangement of rivets –specification of rivets –

LIMITS, FITS & TOLERANCE

Definition of limits, fits & tolerances – select dimensions from BIS to Obtain clearance, transition and interference fits for a given set of mating parts. Computation of fit and tolerances from the table –

preparation of drawings of mating parts and representation of fits and tolerances – representation of quality of surface finish on the drawings as per BIS.

Exercise in computing tolerances - simple problems

Examples for hole basis systems, shaft basis systems – familiarization of tables- symbols and grade –examples for all fits as per Indian standard.

MODULE– II

ASSEMBLY AND DETAILED DRAWING

Needs and functions of assembly and detailed drawings – selection of sheet size – preparation of title block – bill of materials and part list – steps in preparing assembly and detailed drawing – practice in tracing exercises. Exercise in preparing assembly and detailed drawing of commonly available components such as clamps, couplings, turnbuckle and equalizing clamps. Conventional representation of machine parts- visible screw thread – section in internal and external thread – slotted head – ratchet and pinion – repeated parts.

MODULE III

JIGS

Components of jigs and fixtures – different types of bushes – locating pins and clamping devices – types of jigs – plate jig, box jig, indexing jig. Drawing needed for the purpose of production.

MODULE IV

FIXTURES

Prepare relevant views of the parts of a given jig & fixtures. Drawing needed for the purpose of production. Discussion the views with relevant notes and indications —Fixtures turning fixture, milling fixtures, grinding fixture, broaching fixtures (surface symbols, hardness symbols, detailed dimension, bill of material, etc

REFERENCE BOOKS

1. Jigs & Fixtures - Joshy
2. Production Drawing - John & Varghese
3. Machine Drawing - N.D. Bhat
4. Design Data Hand Book - PSG
5. Jigs & Fixtures - Grant
6. Machine Drawing - N. D Junnarkar