GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Diploma

Branch: Fabrication Technology

Course/Subject Code: DI02C55011(Only for C to D Students)

Course / Subject Name: Fabrication Workshop Practice

w.e.f. Academic Year:	2024-25
Semester:	2nd
Category of the Course:	ESC

Prerequisite:	-
Rationale:	Studying Fabrication Workshop Practice equips students with the practical skills, theoretical understanding, and professional competencies needed to excel in various technical and engineering fields. It provides students with the hands-on skills necessary to fabricate and assemble various components. This includes fitting, welding, smithy, tin smithy and other manufacturing processes.

Course Outcomes:

After Completion of the Course, Student will be able to :

No	Course Outcomes
01	Use the preliminary safety measures while working in different shops of engineering workshop
02	Use different tools for making a fitting job
03	Use different tools and equipments for making a given template
04	Use different tools and equipments for making a given forging job
05	Use different tools and equipments for making given fabrication set-up & fit-up jobs

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
				Theory		Tutorial/ Practical		
L	T	PR	C	ESE (E)	PA/ CA (M)	PA/CA (I)	ESE (V)	
0	0	6	3	0	0	50	50	100

Course Content:

Unit No.	Content	No. of Hours	%of Weightage
Unit-1 Introduction to Workshop	1.1 Familiarization of different fabrication shops 1.2 Safety precautions and good housekeeping in fabrication work shop 1.3 Layouts of different sections of fabrication workshop	14	15.5 %
Unit-2 Bench work and Fitting	2.1 The operations performed in fitting shop 2.2 The tools and equipments used in fitting shop 2.3 Applications of tools and equipments used in fitting shop	22	24.5 %
Unit-3 Sheet Metal Template Preparation	3.1 Demonstration of template and its application in fabrication workshop 3.2 Types of sheet metal 3.3 Different types of marking and measuring tools used in sheet metal work 3.4 Different types of cutting tools used in sheet metal work	06	7 %
Unit-4 Fabrication job set-up & fit-up	4.1 Types of arc welding processes 4.2 Welding symbols 4.3 Different types of weld joints 4.4 Types of weld joint edge preparation	30	33 %
Unit-5 Forging Work	5.1 Introduction to forging process 5.2 Forging materials 5.3 Forging Hand tools and applications 5.4 Forging operations 5.5 Forging processes	18	20 %

Suggested Specification Table with Marks (Theory) :

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
20%	09%	71%	-	-	-

Where R:Remember; U:Understanding; A:Application; N:Analyze; E:Evaluate; C:Create (as per Revised Bloom's Taxonomy)

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

References / Suggested Learning Resources:

(a) Books:

Sr. No.	Title of Book	Author	Publication with place, year and ISBN
1.	Elements Of Workshop Technology Vol-1	S. K. Hajra Choudhary A. K. Hajra Choudhary Nirjhar Roy	Media promoters & Publishers Pvt. Ltd., Mumbai Edition (2008) ISBN-13 : 978-8185099149
2.	Workshop Practice	H.S. Bawa	McGraw Hill Education, Noida Edition #2 (2017) ISBN-13 : 978-0070671195
3.	A Textbook Of Workshop Technology : Manufacturing Processes	R.S. Khurmi J. K. Gupta	S. Chand and Co., New Delhi Edition #16 (2021) ISBN-13 : 978-8121908689
4.	Introduction To Basic Manufacturing Process & Workshop Technology	Rajender Singh	New Age International, New Delhi Edition #2 (2010) ISBN-13 : 978-8122430707

(b) Open-source software and website:

1. http://www.abmtools.com/downloads/Woodworking%20Carpentry%20Tools.pdf
2. http://www.weldingtechnology.org
3. http://www.newagepublishers.com/samplechapter/001469.pdf
4. http://www.youtube.com/watch?v=TeBX6cKKHWY
5. http://www.youtube.com/watch?v=QHF0sNHnttw&feature=related
6. http://www.youtube.com/watch?v=Kv1zo9CAxt4&feature=relmfu
7. http://www.piehtoolco.com
8. http://sourcing.indiamart.com/engineering/articles/materials-used-hand-tools/

Suggested Course Practical List:

Sr. No.	List of Practical	No. of Hours
1	Get awareness of fabrication workshop	02
2	Prepare a layout of fabrication workshop and show different equipments used in fabrication workshop	06
3	Demonstrate different safety aspects observed in fabrication workshop	02
4	Write different safety rules to be observed in fabrication workshop	02
5	List different safety equipments and protective clothings used in fabrication workshop	02
6	List different tools used in fitting shop and identify them	02
7	Draw neat sketch of different fitting tools and write its applications	04
8	Prepare a fitting job from given sketch	16
9	Prepare different templates from paper sheet as per given sketch	02
10	Prepare different templates used in fabrication shop from sheet metal as per given sketch	04
11	Draw different welding symbols used in fabrication drawing	02
12	Draw different types of edge preparation for fabrication set-up & fit-up	04
13	Prepare a butt weld fabrication set-up & fit-up	14
14	Prepare a fillet weld fabrication set-up & fit-up	10
15	List different tools used in forging shop and identify them	02
16	Draw neat sketch of different forging tools and write its applications	04
17	Prepare a forging job as per given sketch	12
	Total	**90**

List of Laboratory / Learning Resources Required:

Bench work & Fitting

- Hand vice, Machine vice, Marking table, Surface plate, Angle plate, Universal scribing block, Scriber, Marking gauge, Fitting tables, Tri square, Right angle, Combination set, V block with clamps, C clamps, Set of needle files, Ball pane Hammer - 750 gms, Pair of outside spring caliper- 250 mm, Pair of Inside spring caliper 150 mm, Vernier caliper, Vernier Height Gauge, Micrometer outside & inside, Bevel protractor, Odd leg caliper, Files (smooth & rough)-round, flat, safe edge, square, knife edge, triangular, half round, One pair of divider, Hacksaw frame with blade 12”x 300 mm, Centre punch, Dot punch, Prick punch, Letter punch, Number punch, Flat chisel 20 mm, Set of sorted twist drills, taps and dies (with holders/wrench), Set of spanners-Fix, Ring, box, Allen and Adjustable, Set of screw drivers-sorted, Scraping tool, Set of pliers, Filler and radius gauge etc.

Fabrication job set-up & fit-up

- Arc Welding power source, Spot welding machine, Welding cables, Electrodes, Fluxes, Electrode holders, Ground clamps, Chipping hammer, Wire brush, Try Square, tongs, Screw Wrench, Tip Cleaner and Personal Protective Equipment like safety gloves, face shield /screen etc.

Forging and Template making

- Anvil, Swage block, Hammers, Rubber mallet, Wooden mallet, Slip 12", 10" Slip ordinary, Half-moon stake, Side stake, Exiting stake, Cross stake, Funnel stake, Tee & bottom stake, Stake holding stand, Combination pliers, S.W.G, Hand riveting m/c, Spinning hath 6' with die, Power hydraulic press m/c, Riveting m/c, Round stake

Suggested Project List:

1. Undertake a market survey of local dealers for procurement of workshop tools/ equipment/machines and raw material.
2. Prepare a list of specifications for various tools/equipment/machines used in the engineering workshop.
3. Visit the local sheet metal trader /fabricator, collect all relevant information and submit the detailed report.
4. Select a structural fabrication product (approved by subject teacher) and prepare list of tools and equipments required to manufacture it.
5. Prepare report using different books, technical magazine, journals, etc. on the topic given by the subject teacher within the syllabus or beyond the syllabus.
6. Prepare his/her video on demonstrating different fit up set up, cutting process, joining process etc. given by the subject teacher.
7. Collect some brochure of tools/equipments used for fabrication from local/online vendors.
8. Prepare power point presentation on marking, cutting, forging, fabrication, etc.

Suggested Activities for Students:

1. Prepare a list of specifications for various tools/equipment/machines used in the workshop
2. Download videos showing correct practices for safety in fabrication workshop
3. Download videos showing correct practices for fitting shop
4. Download videos showing correct practices for template making
5. Download videos showing correct practices for forging
6. Download videos showing correct practices for fabrication set-up & fit-up

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