GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Diploma

Branch: Plastics Engineering

Course / Subject Code : DI01023011

Course / Subject Name : Plastic Engineering Workshop

w. e. f. Academic Year:	2024-2025
Semester:	1st
Category of the Course:	BSC-02

Prerequisite:	-
Rationale:	In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices with Plastics Engineering concepts are included in the curriculum in order to provide hands-on experience about use of different tools and measuring instruments. This course aims at developing in general, manual and machining skills in the students. Besides above, it aims at development of dignity of labor, precision, safety at work place, team spirit and right attitude which are essential for getting placement.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Use carpentry machines and hand tools with precision and safety.	A
02	Use fitting machines and hand tools with precision and safety.	A
03	Use welding machines and hand tools with precision and safety.	A
04	Use fabrication machines and hand tools with precision and safety.	A
05	Promote reuse of scrap material.	R/U

**Revised Bloom's Taxonomy (RBT)*

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	2	4	4	0	0	20	30	50

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Course / Subject Code : DI01023011

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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	**Carpentry** - Carpentry tools - Marking, planning, sawing and chiseling - Preparation of wooden mould elements - Safety precautions in carpentry shop - Reuse of carpentry scrap and waste material	12	25
2.	**Fitting** - Metals and plastic-Steel, Brass, Copper, Aluminum, Plastics etc. - Different shapes-i.e. Flat, Angle, Tee, Channel, Bar Girder, Square, Z-Section - Holding devices and files-demonstration - Safety precautions in Fitting shop - Reuse of fitting scrap and waste material	12	25
3.	**Welding** - Welding equipment - Welding types - Safety precautions during welding - Reuse of welding scrap and waste material	12	25
4.	**Fabrication** - Identify different FRP tools. - Safety precautions in the Fabrication shop - Procedure of FRP fabrication - Reuse of fabrication scrap and waste material	12	25
	Total	**48**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
10	10	60	0	0	20

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

References/Suggested Learning Resources:

(a) Books:

Sr. No.	Title of Book	Author	Publication with place, year and ISBN
1	Elements of Workshop Technology (Volume I,II and III)	Choudhary Hajra S.K and Choudhary Hajra A.K.	Media Promoters & Pub Pvt Ltd, Mumbai, 2014, 5551234002069
2	Workshop Technology	Bawa H.S	Tata McGraw Hill Education Pvt. Ltd, Delhi, 2015, 9780070671195
3	Workshop/Manufacturing Practices	Kumar Kaushik, Kalita Hridayjit	Vikas Publishing House, New Delhi, 2019, 9789353387419
4	A Course In Workshop Technology Vol I	Raghuwansh B.S	Dhanpat Rai and Co., New Delhi, 2019, 9781020092015
5	Plastics Engineering Handbook	Berins M	Springer Science & Business Media, Singapore, 1991, 9780412991813
6	Plastics Materials And Processes	Schwartz Seymour S., Goodman Sidney H.	Van Nostrand Reinhold, USA, 1982, 9780442227777

(b) Open source software and website:

1. http://www.fao.org/docrep/012/al360e/al360e.pdf
2. https://www.gopracticals.com/workshop/workshop-practical-carpentry-shop-t-lapjoint/
3. http://www.bspublications.net/downloads/05229cf9b012a3_workshop_Ch_1.pdf
4. https://egyankosh.ac.in/bitstream/123456789/29753/1/Unit-3.pdf

Suggested Course Practical List:

No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Prepare wooden block as per drawing	I	06
2	Prepare wooden mould elements (Bolster)	I	06
3	Prepare rectangular or square job of MS as per dimensions	II	08
4	File the job by straight edge & angle for matching two components	II	06
5	Drill on metal plate as specified	II	04
6	Tap on metal plate as specified	II	04
7	Cut and drill acrylic sheet as per drawing	II	04
8	Join two metal pieces by welding	III	08
9	Prepare FRP sheet as per dimensions	IV	08
10	Fabricate work using FRP sheet	IV	06
Total			**60**

List of Laboratory/Learning Resources Required:

Sr. No.	Equipment Name with Broad Specifications
1	Basic work shop tools (hammer, chisel, filing, measuring instruments, Vice fitting, fastening devices etc.)
2	Welding machine (Output current 20-200 Amp DC, V 220, Input current 6.3kVA, Suitable for 2.5mm rod)
3	Hack saw hand operated and automatic
4	Wooden blocks various sizes
5	Metal plates & bars various sizes
6	Acrylic Sheets various sizes
7	FRP Sheet various sizes
8	Hand drill & Taps (No load speed 2600RPM, Power input 350 W, Maximum drill die 10mm)

Suggested Project List:

1. Prepare wooden hand injection mold elements
2. Prepare model using acrylic sheet
3. Prepare article using FRP sheet

Suggested Activities for Students:

1. Collect various products made up of wooden, Mild Steel, Acrylic and FRP. Make a collage.
2. Prepare the chart on safety precautions and rules
3. Prepare the list of major machines/tools used with their brand, price, specifications, electrical consumption, and output per hour. Make a presentation to other students

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