GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Bachelor of Engineering

Branch: ALL

Course / Subject Code : BE01R00131

Course / Subject Name : Workshop and Manufacturing Practices

w. e. f. Academic Year:	2024-25
Semester:	Ist Year
Category of the Course:	Engineering Science

Prerequisite:	**Nil**
Rationale:	Workshop practice is the backbone of the real industrial environment which helps to develop and enhance relevant technical hand skills required by the technician working in the various engineering industries and workshops. Irrespective of branch, the use of workshop practices in day to day industrial as well domestic life helps to dissolve the problems.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
CO -1	Perform basic operations of fitting and Carpentry.	A
CO -2	Demonstrate Casting, Welding and Plumbing work.	U
CO -3	Practice on Plumbing work and Smithy work	A
CO -4	Explain applications of Plastic, Glass and Ceramic processes.	U
CO -5	Explain basic concepts of digital fabrication.	U

Teaching and Examination Scheme:

Teaching / Learning Scheme (in Hours per semester)					Total Credits = TH/30	Assessment Pattern and Marks					Total Marks
						Theory		Tutorial / Practical			
L	T	P	TW/SL	TH		ESE (E)	PA (M)	PA/ (I)	TW/ SL (I)	ESE (V)	
00	00	30	00	30	01	00	00	20	00	80	100

Where L = Lecture, T= Tutorial, P= Practical, TW/SL = Term-Work / Self-Learning, TH = Total Hours, PA = Progressive Assessment, ESE = End-Semester Examination

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	**Fitting Shop** Demonstration on different tools used, Hands on Practice and job making in Fitting shop.	05	17
2	**Carpentry** Demonstration on different tools used, Hands on Practice and job making in Carpentry shop.	06	20
3	**Welding and Casting shop** 1. Hands on Practice and job making using Electric arc Welding/ Resistance welding process. 2. Hands on Practice and job making in Smithy/ Tin smithy Shop 3. Demonstration of Pattern making and Sand molding	05	17
4	**Plumbing and its fitting** (1) Types of Pipes and Fittings, (2) Joints (PVC and Metal), (3) Plumbers tools and equipment's, (4) Cutting and bending of different mental pipes (5) Pipe fitting, (6) Plumbing symbols, (7) Plumbing services (8) Sanitary Pipes and Fittings, (9) Joints	04	13
5	**Introduction to Plastic, Glass and Ceramic technology:** Plastic materials, Types of Plastics and application. Plastic molding processes, Describe the characteristics and application of the following glasses: - a) Borosilicate glass b) Pyrex glass c) Heat resisting glass d) Colored glass e) Ruby glass f) Laminated glass. Definition & scope of ceramics and ceramic materials, classification of ceramic materials – conventional and advanced, Areas of applications.	06	20
6	**Digital Fabrication**: Introduction to digital fabrication tools: 3D Printers (FDM, SLS, SLA) CNC tools etc., Procedural steps to start with digital fabrication. Design for digital fabrication, demonstration of 3 D Printing. Application and Advantage of Digital Fabrication	04	13
	Total	**30**	**100**

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
-	-	-	-	-	-

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:

1. Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
2. Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGraw Hill House, 2017.
3. Workshop Technology Vol. 1 and 2 by Raghuvanshi B.S. Dhanpat Rai & Sons1998.
4. Workshop Technology by Chapman W.A. J and Arnold E. Viva low priced student edition, 1998.
5. Workshop Practices, H S Bawa, Tata McGraw-Hill,2009.
6. Hand book of glass manufacturers Vol I & II F.V Tooley Ogden Publishing co. New York
7. Modern Glass Practice Samuel R. Scholes CBI Publishing Co. INC
8. Industrial ceramics Singer and Singer Oxford & IBH
9. Elements of ceramics F.H. Norton Longman Higher Education
10. J. A. Brydson, "Plastics Materials", Butterworth- Heinemann - Oxford, 7th Ed., 2001.
11. Irvin. I. Rubin, "Hand Book of Plastic Materials and Technology", Wiley Interscience, NY, 1990.
12. HMT Production Technology, Tata Mc Graw Hill (India), 1992
13. Introduction to Ceramics - W.D Kingery

(b) Open source software and website:

1. http://nptel.iitm.ac.in/courses.php

Suggested Course Practical List:

Workshop Practice:

1. Fitting shop
2. Carpentry
3. Welding shop
4. Casting
5. Smithy
6. Plastic molding & Glass Cutting
7. Plumbing and its fitting
8. Digital Fabrication: 3D printer and CNC

List of Laboratory/Learning Resources Required: Suggested as per above

Suggested Project List: As per availability at Institute, if not demonstration or by video session

Suggested Activities for Students: As per above listed in Workshop practice

* * * * * * *