

LOK JAGRUTI UNIVERSITY (LJU)
INSTITUTE OF ENGINEERING & TECHNOLOGY

Department of Mechanical Engineering (710)

Bachelor of Engineering (B.E.) – Semester – I

Course Code:	017102193
Course Name:	Workshop Practice - Laboratory
Category of Course:	Engineering Science Course (ESC)
Prerequisite Course:	---

Teaching Scheme			
Lecture (L)	Tutorial (T)	Practical (P)	Credit
0	0	4	2

Sr No.	Practical Title	Link to Theory Syllabus
1	Introduction to Machine Shop 1.1 Demonstration of job on Lathe machine 1.2 Demonstration of job on Drilling machine 1.3 Demonstration of job on Milling machine 1.4 Demonstration of job on Grinding machine	--
2	Fitting Shop 2.1 Hands on Practice and job making in Fitting shop	--
3	Carpentry Shop 3.1 Hands on Practice and job making in Carpentry shop	--
4	Tin Smithy 4.1 Hands on Practice and job making in Tin Smithy	--
5	Introduction to Plumbing 5.1 Types of Pipes and Fittings 5.2 Joints (PVC and Metal) 5.3 Plumbers tools and equipment's 5.4 Pipe cutting and fitting	--
6	Study About Masonry Work 6.1 Different types of Bricks 6.2 Different size and part of Bricks 6.3 Different types of Bonds 6.4 Types of tools used for various masonry works	--
7	Basics of Electrical Systems 7.1 Measurement of voltage, current and power 7.2 Wire switchboard, fan, tube light, two-way control (staircase wiring) 7.3 Identify open circuit, and short circuit faults in System	--
8	Internet of Things 8.1 Introduction to Arduino hardware and software interfacing 8.2 Arduino LED on/off 8.3 Distance measurement using Arduino (Ultrasonic and Infrared Sensors) 8.4 Temperature measurement using Arduino (RTD Sensors)	--
9	Measuring Instruments 9.1 Linear Measurement (Engineers Scale, Vernier caliper, Micrometers, Height gauge) 9.2 Angular Measurement (Sine bar, Bevel protractor, Spirit Level) 9.3 Speed Measurement (Tachometer) 9.4 Flatness Measurement (Dial gauge)	--
10	Welding Shop 10.1 Demonstration of resistance welding 10.2 Demonstration of arc welding 10.3 Demonstration of gas welding 10.4 Demonstration of MIG welding	--

Major Components/ Equipment	
Sr. No.	Component/Equipment
1	Fitting vice, various types of files for fitting shop, machine and hand hacksaw
2	Carpentry vice, various types of files, machine and hand hacksaw, chisels, jack plane
3	Anvil, different types of hammers, tongs, scissors, hand shear machine, sheet cutter
4	Plumbing vice, machine and hand hacksaw, monkey spanner, Tap wrench
5	Arc welding machine, welding goggles, welding gloves, gas welding machine
6	Engineers Scale, Vernier caliper, Micrometers, Height gauge, Sine bar, Bevel protractor, Spirit Level, Tachometer, Dial gauge
7	Masonry Tools - Trowel, Margin Trowel, Corner Trowel, Mason's Hammer, V or Square Notch Trowel, Cold Chisel
8	Arduino board, LED, Ultrasonic sensor, IR sensor, RTD, Breadboard, Wires.
9	Multimeter, Switches, Wires.

Proposed Theory + Practical Evaluation Scheme by Academicians (% Weightage Category Wise and it's Marks Distribution)					
L:	0	T:	0	P:	4
Note: In Theory Group, Total 4 Test (T1+T2+T3+T4) will be conducted for each subject. Each Test will be of 25 Marks. Each Test Syllabus Weightage: Range should be 20% - 30%					
Group (Theory or Practical)	Group (Theory or Practical) Credit	Total Subject Credit	Category	% Weightage	Marks Weightage
Theory	0	2	MCQ	0%	0
Theory			Theory Descriptive	0%	0
Theory			Formulas and Derivation	0%	0
Theory			Numerical	0%	0
Expected Theory %			0%	Calculated Theory %	0%
Practical	2		Individual Project	40%	40
Practical			Group Project	40%	40
Practical			Internal Practical Evaluation (IPE)	0%	0
Practical			Viva	20%	20
Practical			Seminar	0%	0
Expected Practical %	100%	Calculated Practical %	100%	100	
Overall %	100%			100%	100

Course Outcome

Upon completion of the course students will be able to	
1	Understand various machine tool like lathe, drilling, milling and grinding for manufacturing processes in machine shop, perform basic operations of fitting using different tools in fitting shop.
2	Perform basic operations of carpentry and tin smithy using different tools in carpentry shop and tin smithy shop, understand the basic of plumbing using different types of its fittings and plumbing tools.
3	Understand the basic of bricks with type of wall and application of different tools used in masonry work, understand the different types of electrical measuring instruments like voltmeter and ammeter with applications, understand the use and capabilities of IOT devices.
4	Learn about the various linear and angular measuring instruments with its least count value and understand the various welding processes and its applications.

Suggested Reference 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 & Sons 1998
4	Workshop Technology by Chapman W.A. J and Arnold E. Viva low priced student edition, 1998
5	Exploring Arduino, Jeremy Blum. Wiley
6	16th Edition IEE Wiring Regulations Explained and Illustrated Seventh Edition by Brian Scaddan
7	Principles of Electrical Measurement by S Tumanski
8	Building Construction by Dr. B. C. Punamia
9	Building Construction by S. C. Rangwala

List of Open Source Software/Learning website

1	http://nptel.ac.in/
2	http://www.ocw.mit.edu

Practical Project/Hands on Project

Sr. No.	List of Practical Projects/Hands on Project	Linked with Unit
1	Prepare Alphabets of Metal plate using fitting operation	Unit 2 and Unit 9
2	Build a Piece of Furniture (Chalk Box, Table, Name plate etc.)	Unit 3 and Unit 9
3	Prepare an illustrative chart/list of PVC pipe fitting tools for Home.	Unit 5 and Unit 9
4	Make Bird Feeder using sheet metal.	Unit 4 and Unit 9
5	Measuring Speed of Sound using Ultrasonic sensor.	Unit 8 and Unit 9
6	Prepare an illustrative chart/list of Welding Tools and Equipment with their various application	Unit 10
7	Prepare an illustrative chart/list of Masonry Tools used in the Construction Industry worldwide	Unit 6