

Course Code	Course Title	L	P	U
TA102	Workshop	2	4	4

**Scope & objective of the course:** This course is designed to make the students familiar with the basic manufacturing processes used for producing finished articles out of wood, ferrous and non-ferrous metals. The processes covered include Casting, Joining processes, Metal Forming, Sheet Metal work and Modern manufacturing processes. The students are exposed to modern manufacturing courses like the application of non-conventional resources in manufacturing and usage of computers in manufacturing. A brief review of the properties and heat treatment of common engineering materials and of measuring and gauging tools are also included. At the end of the course the students will be familiar with basics of all manufacturing processes.

In practical classes the student is required to acquire knowledge of handling some of the basic general purpose machine tools, carpentry work, foundry, fitting independently.

#### Course Outcomes:

- (i) Ability to design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
- (ii) Ability to design and model various basic prototypes in the trade of fitting such as Straight fit, V- fit.
- (iii) Ability to make various basic prototypes in the trade of Tin smithy such as rectangular tray, and open Cylinder.
- (iv) Ability to perform various basic House Wiring techniques such as connecting one lamp with one switch, connecting two lamps with one switch, connecting a fluorescent tube, Series wiring, Go down wiring.
- (v) Ability to design and model various basic prototypes in the trade of Welding such as Lap joint, Lap Tee joint, Edge joint, Butt joint and Corner joint.

#### Text book(s):

- T1: Elements of Manufacturing Processes: B. S. NagendraParashar, R. K. Mittal: PHI, 2010.  
T2 : “ Elements of Workshop Technology” Vol I Machine Tools, S.K Hajra Choudhury, A.K HajraChoudhury,Nirjhara Roy by MPP.  
T3 :“ Manufacturing Practice” Dr R.K Singal, Katson Books  
T4:“Mechanical Workshop Practice” K. C John, Estern Economy Edition, Second edition, PHI

#### Reference book(s):

- R1: Principles of Manufacturing Materials and Processes: J.S.Campbell: Tata McGraw Hill, 2010.


  
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R2: Manufacturing processes for Engineering Materials: S. Kalpakjain, Steven R. Schmid: Pearson Education, 5<sup>th</sup> Edition, 2012.

R3: Materials and Processes in Manufacturing: E. Paul Diagram, J. T. Black: PHI, 9<sup>th</sup> Edition, 2008.

R4: Workshop Manual: P. Kannaiah & K. L. Narayana: SciTech Publications, 2010.

Lecture Nos	Topics to be covered	Reference (Chapter/Sec/Page Nos. (of Text/Ref. Books))
1	Manufacturing Concepts	1.1 to 1.5
2-3	Engineering Materials	2.1, 2.4 to 2.8
4-5	Measurements and Quality in Manufacturing	3
6-7	Theory of Metal Cutting	4.1 to 4.6, 4.10 to 4.16
8-10	Turning Operations	5.1, 5.2, 5.4, 5.6 to 5.11
11-13	Drilling and Allied operations, Shaping, Planning and Slotting operations	6, 7
14-15	Milling Operations	8
16	Finishing Operations	9.1 to 9.5
17	Heat treatment and hot and cold working of materials for Material Property Manipulation	10
18-20	Casting process	11.1 to 11.7, 11.9 to 11.12, 11.14
21-22	Metal Forming Processes	12.1 to 12.2.2, 12.2.4, 12.3, 12.4, 12.5
23	Sheet-metal working	13.1 to 13.3, 13.5 to 13.9
24	Powder metallurgy manufacturing process	14
25-26	Mechanical Joining Processes	15.1 to 15.4.2, 15.5 to 15.7
27	Non-Conventional Resources in Manufacturing	17.1 to 17.3, 17.4.3, 17.4.4
28	Computer Controlled Manufacturing Processes	18.1, 18.2, 18.5, 18.7.0
29	Economics of manufacturing	19
30	Power transmission in machine tools	21.1 to 21.2.5 21.5 to 21.5.4 (up to compound gear train)

**List of Experiments:**

S.No	Name of the Exercise
1	Orientation Session a) Introduction to lab b) Trades and tools c) Safety precautions d) Evaluation scheme
2	Measurement using precision instruments a) Vernier callipers b) Screw gauge c) Inside micrometer d) Depth micrometer e) Vernier height gauge f) Feeler gauge
3	To make a joint using wood as raw material
4	To make a job as per the drawing
5	To make a mould of desired shape
6	To obtain a desired fit
7	To make electrical connections a) One bulb controlled by one switch b) One bulb controlled by two switches c) Two bulbs in series connection d) Two bulbs in parallel connection e) Fluorescent tube connection f) Ceiling fan connection
8	To make a cold chisel
9	CNC programming for a given job
10	To make an object as per the drawing using Sheet metal.
11	Lap and butt welding
12	Threading & Elbow joint on pipes
13	Demonstration of various machines (Milling, Grinding & Shaping)

## 5. Evaluation Scheme

Evaluation Component	Duration	Weightage
Internal 1	50min	10
Internal 2	50min	10
Practical		40
Comprehensive	3hrs	40

- 1. Attendance Policy:** A Student must normally maintain a minimum of **75% attendance** in the course without which he/she shall be disqualified from appearing in the respective examination.
- 2. Make-up Policy:** A student, who misses any component of evaluation for genuine reasons, must immediately approach the instructor with a request for make-up examination stating reasons. **The decision of the instructor in all matters of make-up shall be final.**
- 3. Chamber Consultation Hours:** During the Chamber Consultation Hours, the students can consult the respective faculty in his/her chamber without prior appointment.

  
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