

**Department of Mechanical Engineering**  
**Lesson Plan**

**Name of the Subject** : Manufacturing Technology-I (14BT30304)  
**Class & Semester** : II B.Tech. I-Sem  
**Name of the faculty Member** : Dr.B.K.C.Ganesh

S. No.	Topic	No. of periods	Book(s) followed	Topics for self-study
<b>UNIT – I: METAL CASTING PROCESSES</b>				
1	Classification of manufacturing processes, Introduction to casting process	1	T1, T2	
2	Sand moulding procedures, patterns, pattern allowances, pattern materials, Types of patterns	3	T1,T2	
3	Moulding materials, Types of moulding sands	1	T1,T2	
4	Testing sand properties	1	T1	
5	Types of sand moulds, moulding machines	1	T1,T2	
6	Types of cores, casting defects, design of gating systems	2	T1,T2	
<b>Total periods required:</b>		<b>09</b>		
<b>UNIT – II: MELTING AND SPECIAL CASTING PROCESSES</b>				
7	Types of Furnaces: Crucible, cupola, electric arc furnaces	3	T1 ,T2	
8	Shell moulding, precision investment casting,	2	T1, R1	
9	Permanent mould casting, die casting, low- pressure die casting,	2	T1 , R1	
10	Centrifugal casting, continuous casting and squeeze casting.	2	T1 , R1	
<b>Total periods required:</b>		<b>09</b>		
<b>UNIT – III: INTRODUCTION TO JOINING PROCESSES</b>				
11	Introduction to Joining processes, Adhesive bonding, Mechanical fastening	2	T1, T2, R1, R3	
12	Classification of welding processes, types of welds and welded joints and their characteristics	2	T1, R1,&R3	
13	Design of welded joints, Welding fluxes and filler rods	2	T1, T2	
14	Soldering and brazing processes.	1	T1, T2, R3	
15	Gas welding processes: Introduction, Oxy-fuel welding processes, Oxy-fuel gas cutting.	2	T1, T2	
<b>Total periods required:</b>		<b>09</b>		

<b>UNIT –IV: ELECTRIC ARC AND RESISTANCE WELDING</b>				
16	Electric arc welding: Principle of arc, Arc-welding equipment, Electrodes	2	T1 ,R2	
17	Manual metal arc welding (SMAW), Arc Blow, Carbon arc welding	2	T1 , T2, R1	
18	Inert-Gas shielded arc welding: TIG and MIG welding, shielding gases, submerged arc welding (SAW)	2	T1 , R2	
19	Resistance welding: Spot welding, Seam welding, Projection welding, upset welding and flash welding,	2	T1 , R3	
20	Thermit welding and Plasma arc welding	1	T1, T2	
<b>Total periods required:</b>		<b>09</b>		
<b>UNIT –V: ADVANCED FABRICATION PROCESSES</b>				
21	Thermit welding, Electro slag welding, Electron beam welding	2	T1,T2, R3	
22	Laser beam welding, forge welding, friction welding, diffusion welding, explosion welding	3	T1,T2, R3	
23	Ultrasonic metal welding, brazing, braze welding and soldering	2	T1,T2, R3	
24	Destructive & Non-destructive testing of welds	2	T1,T2, R3	
<b>Total periods required:</b>		<b>09</b>		
<b>Grand total periods required:</b>		<b>45</b>		

**TEXT BOOKS:**

- T1. P.N. Rao, *Manufacturing Technology*, Vol:1, TMH, 4<sup>th</sup> edition, 2013.
- T2. Kalpakjian, Serope, *Manufacturing Engineering and Technology*, Pearson education, 7<sup>th</sup> edition, 2014.

**REFERENCE BOOKS:**

- R1. R.K. Jain, *Production Technology*, Khanna Publishers, 17<sup>th</sup> edition, 2010.
- R2. Rosenthal, *Principles of Metal Castings*, McGraw-Hill Professional Publishing, 3<sup>rd</sup> edition, 2013.
- R3. R.S. Parma, *Welding Engineering and Technology*, Khanna Publishers, 1<sup>st</sup> edition, 2014