

4034 - MANUFACTURING PROCESS – I									
Teaching Schedule Per Week			Progressive Assessment	Examination Schedule (Marks)					
Lectures	Practical	Credits		Theory			Practical Ex.		Total
2	4	6	75	3hrs.	100	-	-	-	175
Pre-requisite		Source	Semester	Theory	Test	Total	TW	PR	Gr Total
2004		MEC		75	25	100	50	-	150

Rationale:- As a technician the knowledge and practical skills in different engineering processes are essential and hence enough weightage is given in this course towards skill development. Further the Technician should be able to cater to handling of equipment, tools and accessories and also know safety aspect of man, machine and tools. The contents of this course are oriented towards the above.

Competencies to be developed through this course:- The student should be able to select the right pattern, appropriate moulding method and the suitable casting process for the given product to be manufactured. The student should be able to apply the appropriate joining process of welding for the given product under the given circumstances. The student should be able to choose and apply the correct metal forming process depending on the product to be manufactured. The student should know the appropriate process for preparation and processing of powdered iron and non-ferrous metals to produce the required product.

COURSE CONTENTS		Hrs	Mks
1. PATTERN MAKING		5	16
1. Introduction, 2 Materials used for pattern making & safety clothing, 3 Types of patterns, 4 Pattern making allowances, 5 Core prints, 6 Core boxes.		5	16
2. MOULDING		5	16
1. Introduction, 2. Moulding tools and equipment, 3. Ingredients of moulding sands, 4. Types of moulding sands, 5. Sand additives, 6. Properties of moulding sand, 7. Sand preparation, 8. Moulding processes based on sand used, 9. Process of making green sand moulds, 10. Moulding processes based on methods used, 11. Core and core- making, 12. Elementary introduction to special moulding processes.		5	16
3. FOUNDRY PROCESSES		8	24
1. Introduction, 2. Layout of foundries, 3. Melting furnaces used in foundry, 4. Molten metal handling equipments, 5. Permanent mould castings, 6. Defects in castings and their remedies.		8	24
4. WELDING PROCESSES		6	18
1. Introduction, 2. Types of welding including spot & Press welding, 3. Gas welding, 4 Arc welding, 5 Tools and safety equipment used in welding, 6 Positional methods of welding, 7. Special welding processes. a) TIG Welding, b) MIG Welding, c) SAW Welding, 2.8 Comparison between various types of welding.		6	18
5. METAL FORMING PROCESSES.		3	10
1 Introduction, 2. Hot working, 3. Hot rolling, 4. Piercing, 5. Drawing, 6. Hot spinning, 7. Extrusion, 8. Cold Rolling, 9. Cold Drawing, 10. Cold Bending 11. Cold spinning 12. Cold extrusion 13. Squeezing 14. Penning 15. Sizing coining and hobbing.		3	10
6. POWDER METALLURGY			
1 Introduction, 2 Manufacture of metal powders, 3 Blending of powders, 4 Compacting, 5 Sintering, 6 Products of powder metallurgy, 7 Advantages, disadvantages and limitations of the process.		32	100
Total		32	100

TERM WORK:-

- Pattern Making:- i) Single piece pattern - one job
 ii) Two or multiple piece pattern with core print - one job.
 b) Moulding - Two moulds using above patterns .
 c) Welding - one job each in stringer beading in horizontal and vertical position.
 d) Lathe:- One job involving facing, centre drilling, plain turning, step turning, taper turning

REFERENCE BOOK:-

- 1) Elements of workshop Technology - Vol. I - S.K. Hajra Choudhury & A. K. Hajra Choudhury
 2) Workshop Technology - Vol. I & II - W. A. J. Chapman
 3) Workshop Technology - Vol. I by Raghuvanshi
 4) Workshop Technology Vol. I - Kaushish & Gupta.

