INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (MECHANICAL ENGINEERING)**
SEMESTER	**3**
COURSE TITLE	**MANUFACTURING PROCESS-I**
COURSE CODE	**09ME2305**
COURSE CREDITS	**3**

Objective:

1 This subject of manufacturing processes provides knowledge regarding different types of manufacturing processes used to produce variety of metal products used in mechanical and other machines and equipment. It also develops understanding that can be used to suggest and manipulate vital process parameters related to different manufacturing processes so that the high quality component may be produced at low cost and in minimum time, this is important if we want to compete in today's global market. As a mechanical engineer the knowledge and practical skills in different manufacturing processes are essential and hence emphasis is also given in this course towards skills development.

Course Outcomes: After completion of this course, student will be able to:

1 To apply the knowledge of manufacturing process in the field of manufacturing.

2 Demonstrate knowledge of metal working processes.

3 Employ knowledge of joining metals permanently or temporarily with application of heat.

4 Suggest appropriate casting method suitable for a given industrial component, identify casting defects, their causes and suggest remedies.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	6	0	30	20	25	25

Contents : Unit	Topics	Contact Hours
Total Hours		

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Introduction to manufacturing processes and properties of metal** Nature, role and scope of manufacturing processes, Classification of manufacturing process,, properties of metal, condition affecting manufacturing process.	4
2	**Metal working processes** detail explanation of hot working Process, cold working process, different between hot & amp; cold working process, classification, definition &explanation of Rolling, Forging, Spinning, Drawing, Extrusion, and Swaging processes. Cost terminology associated with forging shop, The procedure of calculating material cost of a product for forging shop (including input weight, cut weight, forged weight etc.), etc.).Procedure of estimating cost of forging dies. Procedure of estimating forging cost. Given the forged component, estimate forging cost	8
3	**Metal casting process** Explanation of different types of foundries, detail explanation of pattern, Pattern importance, types, drawing and color code, material, making process, allowance and their values and application, Detail explanation of cores Types, Need, Making materials and its properties, testing methods, sintering, applications., Working and applications of furnaces, Moulding sand, moulding equipment's, major specifications, type of mould ,mould making, Salvage techniques, recovery of sand, casting processes: basic principle, working, process parameters and applications, Casting defects, safety precautions in foundry non- metal casting : injection moulding, blow moulding., Cost terminology associated with foundry shop, The procedure of calculating material cost of a product for foundry shop, Procedure of estimating cost of pattern making, Procedure of estimating foundry cost, Given the casting component, estimate foundry cost.	34
4	**Welding process** Introduction and classification, explanation, working, construction of welding, application of Gas welding, Arc welding, Resistance welding, Elements of cost in arc welding. Factors effecting arc welding cost, Estimating cost elements for: Consumables in arc welding and gas cutting, Gas cutting, and Arc welding, Estimation of production cost of given welding job for above methods	26
5	**Soldering Process** working principle, setup sketch, specifications of equipment, tools and consumables, function of each element, process parameters for various materials	6
6	**Brazing Process** working principle, setup sketch, specification of equipment, various materials practical application	6
Total Hours		**84**

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Textbook :

1 Manufacturing Engineering, J. A. Vadher, Atul prakashan, 2018

References:

1 Elements of Workshop Technology, Elements of Workshop Technology, Choudhary Hajra Sk, Media Publishers & Promoters, India, 2009

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
30.00	40.00	30.00			

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, Quiz, V– Lab, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

1 https://www.reliance-foundry.com/blog/how-to-weld-cast-iron

2 https://mm-coep.vlabs.ac.in/exp/welding-ndyag-laser/procedure.html

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