COURSE TITLE	**MANUFACTURING PROCESS - II**
COURSE CODE	**01ME2402**
COURSE CREDITS	**4**

Objective:

1 Understand the basic concept of different manufacturing processes and their parameters.
2 Compare the different manufacturing processes and parameters
3 Choose the right manufacturing process according to requirements
4 Analyze any conventional processes and parameters
5 Develop the sequence of operations to produce the end product.
6 Judge the limitations and scope of process to perform variety of functions
7 Understanding of basic principles of manufacturing techniques and proper selection of manufacturing processes is required in various field of engineering.

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

1 Interpret core principles and controlling parameters of metal casting.
2 Analyze mould filling, feeding behavior, and solidification characteristics in casting.
3 Judge the suitability and limitations of casting for a given component requirement.
4 Interpret the governing principles and process parameters of welding.
5 Analyze parameter influence on weld quality, joint strength, and process capability.
6 Judge the suitability and limitations of welding for a given joint requirement.

Pre-requisite of course: Knowledge of Manufacturing process-I

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	0	4	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**METAL CASTING** PATTERN MAKING: Identification, Design with allowances,, PATTERN MAKING: Making a wooden pattern, Composition, methodology, No-back mould making, Sodium silicate mould making, Specimen preparation, Permeability testing, Clay Content testing, Sieve analysis, melting metal for ready to pour, Gating system design & preparation, sand mould casting, Industry visit and summery report, Working principle and methodology, List of defects with causes and remedies	16

Contents : Unit	Topics	Contact Hours
2	**METAL JOINING** METAL JOINING Types of joint and edge preparation, SMAW (SHIELDED METAL ARC WELDING): Working Principle and set-up, SMAW (SHIELDED METAL ARC WELDING): Parameters, SMAW Performance, MIG -Working Principle and set-up, MIG - Parameters, Performance, TIG- Working Principle and set-up, TIG- Parameters, Performance, SPOT WELDING :Working Principle and set-up, Parameters, Performance, OXY-ACEYTYLENE GAS WELDING/CUTTING: Working Principle and set-up, Parameters, Performance, FRICTION STIR WELDING: Working Principle and set-up, Parameters, Performance, STUDY OF OTHER/ REMAINING METAL JOINING: Working principle and methodology, METAL JOINING DEFECTS: List of defects with causes and remedies	12
3	**METAL FORMINGAND TESTING** ROLLING: Working Principle and set-up, Parameters, FORGING: Working Principle and set-up, Parameters, EXTRUSION: Working Principle and set-up, Parameters, DRAWING & DEEP DRAWING: Working Principle and set-up, Parameters, METAL FORMING DEFECTS: List of defects with causes and remedies	5
Total Hours		**33**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Study and selection of a component for pattern making** Study and selection of a component for pattern making	2
2	**Design For Allowance and Prepare a Pattern** Design For Allowance and Prepare a Pattern	2
3	**Prepare A Mould and Casting Component** Prepare A Mould and Casting Component	2
4	**Analyse, Defects, Causes and Remedies of cast components** Analyse, Defects, Causes and Remedies of cast components	2
5	**To understand and perform various types of welding joints by using SMAW welding Processes** To understand and perform various types of welding joints by using SMAW welding Processes	2
6	**To understand and perform various types of welding joints by using MIG welding Processes** To understand and perform various types of welding joints by using MIG welding Processes	2
7	**To understand and perform various types of welding joints by using TIG welding Processes** To understand and perform various types of welding joints by using TIG welding Processes	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
8	**To understand and demonstrate Oxy - Acetylene Welding Process** To understand and demonstrate Oxy - Acetylene Welding Process	2
9	**To understand and perform Metal Forming for a given Component** To understand and perform Metal Forming for a given Component	2
10	**To Study Resistance Welding and Perform Spot Welding Process for Give Component** To Study Resistance Welding and Perform Spot Welding Process for Give Component	2
11	**Virtual Lab Experiment for E – Foundry** Virtual Lab Experiment for E – Foundry	2
12	**Virtual Lab Experiment for Metal Forming** Virtual Lab Experiment for Metal Forming	2
Total Hours		**24**

Textbook :

1 Manufacturing Technology Vol-I 3E, P N Rao, McGraw-Hill Education (India) Pvt Limited, 2011

2 Welding Engineering and Technology, Dr. R.S. Parmar, Khanna Publishers, 2013

3 Castings Practice: The Ten Rules of Castings , John Campbell, Butterworth-Heinemann , 2004

References:

1 A TEXTBOOK OF PRODUCTION TECHNOLOGY, A TEXTBOOK OF PRODUCTION TECHNOLOGY, P C SHARMA, S Chand Publishing, 2022

2 Manufacturing Processes and Systems, Manufacturing Processes and Systems, Jairo Munoz Phillip F. Ostwald, Wiley, 2008

3 A Textbook Of Welding Technology , A Textbook Of Welding Technology , O.P. Khanna , Dhanpat Rai & Co, 2010

4 Welding Process Technology, Welding Process Technology, P. T. Houldcroft, Cambridge University Press, 1977

5 Manufacturing Engineering and Technology, Manufacturing Engineering and Technology, Kalpakjian, S., Schmid, S., United States: Pearson Education, 2019

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 / Creative
10.00	10.00	60.00	10.00	10.00	0.00

Instructional Method:

1 Theoretical justification will match up with experimental findings.

Supplementary Resources:

1 https://msvs-dei.vlabs.ac.in/
2 https://www.sme.org/fmp/
3 https://onlinecourses.nptel.ac.in/noc23_me131/preview
4 https://onlinecourses.nptel.ac.in/noc23_me90/preview
5 http://efoundry.iitb.ac.in/