

Course Type	Course Code	Name of Course	L	T	P	Credit
DP	NMEC504	Thermo-production Lab	0	0	3	1.5

Course Objective

To provide practical knowledge on Welding processes and Foundry practices.

Learning Outcomes

Upon successful completion of this course, students will:

- Get in hand exposure to different welding processes and their applications.
- Learn about different foundry practices.

Unit No.	Topics	Practical hours	Learning Outcome
1	Green sand preparation and testing: specimen preparation for testing permeability, clay content, grain fineness number, moisture content	3	Understanding about different properties of moulding sand
2	Testing of moulding sand for compression, shear strength and hardness.	3	Understanding about different properties of moulding sand
3	Analysis of metal casting defects: XRD, Ultrasonic testing, etc.	3	Understanding on measurement of casting defects
4	Experiments on special casting processes: Shell molding, investment casting.	3	Hands on experience on the shell molding and investment casting.
5	Permanent mould casting of metal matrix composite.	3	Understanding of preparation MMC
6	Experiment advanced welding processes: Submerged Arc Welding, Plasma Welding, & ultrasonic welding.	3	Understanding of advanced welding process
7	Analysis of metal transfer and heat distribution in welding processes.	3	In-hand practice of welding process
8	Testing of welded joints as per Indian Standard.	3	Understanding of testing process of welding joints
9	Welding robot programming and execution for different welding profile: 2D/3D.	3	Understanding of Welding applications in automation.
10	Modelling and experimental validation of Arc welding process using simulate software.	3	Exposure to research in Welding processes
11	Mini project	3×3	Applications of the above processes for making products.
12	Practice and review	3	Final evaluation
Total		42	

Text book:

1. Manufacturing Engineering and Technology by S. Kalpakjian and Schmid, Pearson Education.