C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: - Technology and Engineering (Diploma Engineering)
DEPARTMENT OF: - Mechanical Engineering
SEMESTER: - III **CODE**: 2TE03MFE1
NAME OF SUBJECT: - Manufacturing Engineering-I

Teaching & Evaluation Scheme:-

Subject Code	Name of the Subject	Teaching scheme					Evaluation Scheme							
							Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total	Credit	Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
2TE03 MFE1	Manufacturing Engineering-I	03	00	04	7	5	30	1.5	70	03	30	20	----	150

Objective:-

This subject provides knowledge regarding different types of manufacturing processes used to produce high quality products with optimum cost and time. It also provides a knowledge frame that can be used to suggest and manipulate vital process parameters related to different manufacturing processes so that the component thus produced can compete in today's global market. It also inculcates safety consciousness in the student required during manufacturing of a component.

Course outline:-

Sr. No.	Course Contents	Number of Hours
1	**Introduction To Manufacturing Processes :** Nature, role and scope of manufacturing processes, Basic principle of mechanical working and its Terminology, Role of metal working, metal casting and metal joining processes.	2
2	**Metal Working Processes :** Hot and cold working processes, Working principles, equipment used and their specifications, process parameters and applications of: Rolling, Bending , Forging, Spinning , Drawing, Shot penning, Extrusion , Coining, Forming, Swaging, Embossing, Sand blasting.	10
3	**Metal Casting :** Types of foundries, Pattern making-process and importance, Patterns-types, sketches, applications, Pattern allowances and their values, material, drawings and colour codes, Cores Types, Core making materials and its properties, Testing, sintering and applications, Furnaces-types, working and applications, Moulding sand, sand properties, sand mixing and sand binders, Moulding equipment, their major specifications, applications, Types of mould, mould making, mould sintering and applications of mould, Salvage techniques, Type of castings- i.e. centrifugal , die , investment , shell moulding , special castings, casting defects-types, causes, effects, remedies, Recent trends in casting including Magnetic and Vacuum, Metal melting and pouring-process, temperatures, precautions. Finishing of casting-need and methods, I.S. grade of casting and its uses, Casting materials-types, standards in BIS, EN, ASME, JIS, compositions, applications, Safety precautions in foundry, Automation in casting process.	18
4	**Metal Joining Processes :** Introduction and classification, Welding-working principle, setup sketch, specifications of equipment, functions of each element, process parameters for various materials, safety precautions for following: Gas welding(Oxy-acetylene, Air-acetylene, oxy-hydrogen and LPG Oxygen) , Arc welding (Carbon arc, metal arc, MIG, TIG, flux coated arc and Submerged arc) , Resistance welding (Butt, spot, seam, projection and percussion),	12

	Thermit welding, Forged welding, Soldering-working principle, setup sketch, specifications of equipment-tools and consumables, functions of each element, process parameters for various materials and safety precautions, Brazing-working principle, setup sketch, specifications of equipment-tools and consumables, functions of each element, process parameters for various materials and safety precautions, Adhesive joining-process, applications, Fastening process- process, applications, Recent trends in metal joining, Electron beam welding, Laser beam welding, Ultrasonic welding, Welding Techniques / methods of joining non-homogeneous metals, Automation in welding	

List of Experiments:-

- Pattern making Practice.
- Moulding making practice.
- Demonstration of metal pouring using wax instead of metal.
- Forging practice.
- Soldering.
- Gas welding (lap joint and but joint).
- Resistance Welding.
- Arc welding (lap joint and but joint).
- Industrial report in group 10 student for each chapter.

Books Recommended:-

- Manufacturing Technology, P.N. Rao, TMH Edition.
- Introduction to Manufacturing Processes, J. A. Schey, McGraw Hill.
- Workshop Technology, W.A.J. chapman, volume I, II and III, Arnold.
- Production Technology, R. K. Jain and S. C. Gupta, Khanna publication.
- Workshop Technology, HajaraChaudhri, Media Promoters & Publisher Pvt. Ltd.