

**Faculty of Engineering & Technology**  
**Fundamentals of manufacturing Processes**

**Information :**

**Course Code :** MAN 321      **Level :** Undergraduate      **Course Hours :** 2.00- Hours

**Department :** Department of Mechanical Engineering

**Instructor Information :**

Title	Name	Office hours
Lecturer	SAMAH ELSAYED ELMETWALLY ELKHATIB	5
Assistant Lecturer	Moustafa Raafat Aziz Shousha	

**Area Of Study :**

By the end of the course the students will be able to:

- Get a basic idea of solidification and casting, alloys, structure and properties, cast-ing products and applications,
- Know about the different casting processes, mould and core-making, sand proper-ties and testing, behaviour of liquid metals, melting and melt treatment,
- Make design for a sound casting using basic equations and to specify the required moulding materials,
- Deal with casting quality control methods,

**Description :**

Processing by casting: powder metallurgy, metal working, material removal, welding and joining, Processing of plastics and ceramics, Finishing processes, Materials recycling.

**Course outcomes :**

**a.Knowledge and Understanding: :**

1 -	know different casting processes, capabilities, and limitations.
2 -	Identify of solidification and casting, alloys, structure and properties, casting products and applications.
3 -	Explain different casting processes, mold and core-making, sand prop-erties and testing, behavior of liquid metals, melting and melt treat-ment.
4 -	State the design basics for a sound casting using basic equations, and to specify the required molding materials.

**b.Intellectual Skills: :**

1 -	Design casting pattern
2 -	Design casting mould using basic equations.
3 -	Design for a sound casting using basic equations.

**c.Professional and Practical Skills: :**

1 -	Differentiate between different casting processes, mould and core-making, sand properties and testing, behaviour of liquid metals, melting and melt treatment.
2 -	Deal with design of casting mold, and cores.
3 -	Analyse the casting and predict the various casting defects.

**d.General and Transferable Skills: :**

1 -	Make scientific Presentation in the casting project.
2 -	Write technical reports about the special casting processes.
3 -	Practice working in team in the casting project.

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to metal casing processes	4	2	2
Casting wrought alloys, continuous casting	4	2	2
Shaped casting, & products, and processes	8	4	4
Sand, molding and core-making processes	4	2	2
Casting design, and pattern design	8	4	4
Special Casting Techniques	8	4	4
Rapid Prototyping	4	2	2
Design of gating system	4	2	2
Design of feeding system	4	2	2
Heat extraction & solidification	4	2	2
Liquid metal behavior & fluid dynamics	4	2	2
Casting project	4	2	2

**Teaching And Learning Methodologies :**

Interactive Lecturing
Problem solving
Discussion
Experiential learning
Search

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00		
Attendance and Participation	10.00		
Final Exam	40.00	16	
First Mid-term	15.00	6	
Quizzes	10.00		
Second Mid-term	15.00	11	

