

IM 112- Manufacturing Technology

CREDIT HOURS

3 Hours

CONTACT HOURS (Hours/week)

Lecture: 2; Tutorial: 2

COURSE COORDINATOR

Dr Mona Fouad

TEXT BOOK:

T.F. Waters and F. Waters, "Fundamentals of Manufacturing for Engineers", Taylor & Francis, latest edition.

COURSE DESCRIPTION:

The course provides an introduction to engineering materials and their properties, production of common metals. It covers types of manufacturing, basic manufacturing processes such as casting, metal forming, welding and machining. An overview of some advanced manufacturing processes is also included. In addition, it introduces measurement standards, instruments, deviations and methods.

PREREQUISITE:

None

RELATION OF COURSE TO PROGRAM:

Required

COURSE INSTRUCTION OUTCOMES:

The student gains knowledge on different methods for processing engineering materials and get acquainted with the basic concepts and necessary information related to manufacturing techniques.

In addition, the student understands different stages or phases for engineering materials processing, the concepts of metal machining and welding techniques and associated applications. He/ She learns the basic concepts of metal forming and casting and different measuring techniques and how it can be used for quality control purposes.

TOPICS COVERED:

- Production of steel and cast iron.
- Forming operations (Rolling – Drawing – Extrusion –Forging).
- Heat treatment operations (Hardening-Annealing-Tempering-Nor realizing).
- Cutting tools (Geometry & materials).
- Mechanics of metal cutting and turning operations.
- Cutting fluids (Function – Type – Selection
- Sand casting (Pattern design & mould preparations).

- Centrifugal casting, die casting and aspects of the casting process.
- Gas and Electric arc welding.
- Electric resistance and pressure welding and aspects of the welding process.
- Standards of measurements, Measuring Instruments.
- Measuring Instruments (Vernier, micrometer, dial gauge, block gauges).
- Measuring methods (Indirect and comparative measurements).

CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:

Professional Component Content			
Math and Basic Sciences	Engineering Topics	General Education	Engineering Design
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RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:

Student Outcomes		Course Outcomes
a.	An ability to apply knowledge of mathematics, science, and engineering.	✓
b.	An ability to design and conduct experiments, analyze and interpret data.	✓
c.	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	
d.	An ability to function on multi-disciplinary teams.	✓
e.	An ability to identify, formulate, and solve engineering problems.	
f.	An understanding of professional and ethical responsibility.	
g.	An ability to communicate effectively.	
h.	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	
i.	A recognition of the need for, and an ability to engage in life-long learning.	
j.	A knowledge of contemporary issues within and outside the electrical engineering profession.	
k.	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	