



EASTERN MEDITERRANEAN UNIVERSITY
FACULTY OF ENGINEERING
Department of Industrial Engineering
IENG263
Materials and Manufacturing Processes
Fall 2021 – 22

Course Syllabus

Course Code : IENG263 **Course Title** : Materials and Manufacturing Processes
Course Type : Core Course **Semester**: Fall 21-22 **Credit Value** : 4 **ECTS Value** : 6
Pre-requisites : CHEM101 **Co-requisites** : None

Instructor : Asst. Prof. Dr. Ali Baştaş **e-mail** : ali.bastas@emu.edu.tr

Office : IE-C104 **Teaching Assistants**: TBA **Office Hours**: TBA

CATALOGUE DESCRIPTION

Materials and properties; structure and manufacturing properties of metals; material selection based on mechanical properties for manufacturing; metal casting; bulk deformation processes (rolling, extrusion, forging); sheet-metal forming; machining processes (turning, drilling and milling); abrasive machining, finishing; welding processes; processing of plastics; tooling safety.

AIM & OBJECTIVES

The main aim of this course is to equip the students with the fundamental knowledge and understanding of engineering materials and industrial manufacturing processes. The associated course objectives are provided below, with a view to enable the students to develop their knowledge and understanding of the following areas:

1. Classification of engineering materials
2. Structure and properties of materials
3. Materials analysis and selection based on mechanical properties for manufacturing
4. Various industrial manufacturing processes including metal casting, metal forming, machining, finishing, welding, and plastics processing
5. Engineering report writing
6. Working as a group to complete a comprehensive, materials and manufacturing engineering project

COURSE LEARNING OUTCOMES

On successful completion of this course, the students are expected to develop **knowledge** and **understanding** of:

- Classification of engineering materials
- Structure and properties of materials
- Materials analysis and selection based on mechanical properties for manufacturing

On successful completion of this course, the students are expected to:

- Identify manufacturing processes, and their fundamentals including casting, forming, machining, finishing, welding and plastics processing processes.
- Identify to compare and analyse the manufacturing processes
- Determine the most appropriate manufacturing processes for a specific task

On successful completion of this course, the students are further expected to develop their **appreciation** of, and respect for **values and attitudes** to:

- Group dynamics, working in teams, respecting team work ethics and contributing to team work.
- The impact of engineering solutions in global, environment and societal context.

CONTRIBUTION OF COURSE TO MEETING THE REQUIREMENTS OF CRITERION 5

Mathematics and Basic Sciences	0%
Engineering Science	70%
Engineering Design	30%
General Education	0%

RELATIONSHIP OF COURSE TO STUDENT OUTCOMES

Student Outcomes	Level of Contribution		
	Moderate	High	NO
1. an ability to identify, formulate, and solve complex problems by applying principles of engineering, science, and mathematics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. an ability to communicate effectively with a range of audiences	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

GRADING POLICY

Exams: All examinations will be based on lectures, tutorials, and videos provided as applicable. To pass these exams, students will need to have studied the material well in advance in order to understand the materials, concepts, and techniques included in the course.

Make-up Exam Policy: Make-up examination will only be offered to those students who missed the final or midterm exam and provided valid documentation (medical report etc.) for their absence within three working days at the latest after the examination date.

Term Project and Lab Reports: A penalty (at least 50% reduction in the grade) for late submissions will be applied if the lab and project report is not submitted on the due date. The project and lab tasks will be advised in separate documentation.

TEACHING/LEARNING METHOD

The teaching/learning methods adopted this semester will be in-class lectures, unless otherwise stated, as per the course of the COVID-19 pandemic. The lectures will also be provided online, through MS Teams, for those students that are unable to attend the in-class lectures due to the COVID-19 pandemic. Tutorials will also be delivered, providing videos on the relevant course topics, additional solved examples and other supplementary information as applicable. All relevant course materials will be provided via the course page implemented on MS Teams and/or the EMU LMS. The students will be provided with updates during the lectures and through posts on the course page on MS Teams and the EMU LMS. The students are expected to regularly monitor the course page on MS Teams and the EMU LMS, and to regularly check their emails for updates.

GRADING POLICY

Although the student's overall grade will be based on the general assessment of the instructor, the following percentages may give an idea about the relative importance of various assessment tools:

Lab Report(s)	20%
Quizzes	15%
Project	20%
Midterm Examination	20%
Final Examination	25%

NG (Nil-grade) Policy: The following conditions will result in the student getting an NG grade from this course:

1. Not attending the Final Exam without a valid excuse.
2. Not attending the Midterm Exam without a valid excuse.
3. Cheating and/or plagiarism during the exams, quizzes and/or the lab and project assignments.

COURSE TEXTBOOK

- Mikell P. Groover, "Fundamentals of Modern Manufacturing 7th Ed.", John Wiley & Sons, Inc., 2019.

SUPPLEMENTARY READINGS

- William D. Callister, "Materials Science and Engineering: an Introduction 10th Ed." John Wiley & Sons, 2018.
- DeGarmo's Materials and Processes in Manufacturing, 13th Edition, J T Black, Kohser, 2019, Wiley.

COURSE CONTENT AND SCHEDULE

IENG263 - Materials and Manufacturing Processes Fall 2021/22 Term Plan					
Week	Week Commencing	Slides	Module	Read Textbook*	Complete
WK1	04-Oct	L00 & L01	Course Policy, Introduction	Chapter 1	
WK2	11-Oct	L02	Structure of Materials	Chapter 2	
WK3	18-Oct	L03	Properties of Materials, Material Selection	Chapter 3	
WK4	25-Oct	L04	Casting Processes I	Chapter 10	Quiz 1
WK5	01-Nov	L05	Casting Processes II	Chapter 11	
WK6	08-Nov	L05	Casting Processes II	Chapter 11	
WK7	15-Nov	L06	Metal Forming Processes I	Chapter 17	Quiz 2
MTW	22-Nov	Midterm Exams			
MTW	29-Nov	Midterm Exams			
WK8	06-Dec	L07	Metal Forming Processes II	Chapters 18 & 19	
WK9	13-Dec	L08	Machining Processes	Chapter 21	
WK10	20-Dec	L09	Abrasive Machining & Finishing Processes	Chapter 24	Quiz 3
WK11	27-Dec	L10	Welding Processes	Chapter 29	
WK12	03-Jan	L11	Processing of Plastics	Chapter 13	
WK13	10-Jan	L12	Additive Manufacturing & Review	Chapter 32	Quiz 4
FW	17-Jan	Final Exams			
FW	24-Jan	Final Exams			
Course Textbook*					
Mikell P. Groover, "Fundamentals of Modern Manufacturing: Materials, Processes, and Systems, 7th Ed.", Wiley, 2019.					

ACADEMIC HONESTY - PLAGIARISM

Cheating is copying from others or providing information, written or oral, to others. Plagiarism is copying without acknowledgement from other people's work. According to university by laws cheating and plagiarism are serious offences punishable with disciplinary action ranging from simple failure from the exam or project, to more serious action (letter of official warning suspension from the university for up to one semester). During the penalty period the student is not allowed to enter the University campus which means the student will not be able to listen the lectures, joining any kind of exams/presentations, submitting homeworks/projects etc. It will also cost the student to receive an **NG grade**. Disciplinary action is written in student records and may appear in student transcripts.