



**EASTERN MEDITERRANEAN UNIVERSITY**  
**FACULTY OF ENGINEERING**  
**DEPARTMENT OF INDUSTRIAL ENGINEERING**  
**COURSE OUTLINE**  
**Spring 2021-22**



<b>COURSE CODE</b>	IENG263	<b>COURSE LEVEL</b>	2nd Year
<b>COURSE TITLE</b>	Materials and Manufacturing Processes	<b>COURSE TYPE</b>	Required
<b>CREDIT VALUE</b>	(4, 1, 0) 4	<b>ECTS</b>	6
<b>PRE-REQUISITE(S)</b>	CHEM101	<b>CO-REQUISITE(S)</b>	-
	<b>Name(s)</b>	<b>E-mail</b>	<b>Office</b>
<b>Instructor</b>	Asst. Prof. Dr. Ali Baştaş	<a href="mailto:ali.bastas@emu.edu.tr">ali.bastas@emu.edu.tr</a>	IE-C104
<b>Assistants</b>	Davood Forghani	<a href="mailto:davood.forghani@emu.edu.tr">davood.forghani@emu.edu.tr</a>	IE-B109
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### 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 development of skills, knowledge and understanding in the following fundamental 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 (CLOs)

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 develop their skills in:

- Identifying manufacturing processes, and their fundamentals including casting, forming, machining, finishing, welding and plastics processing processes.
- Identifying to compare and analyse the manufacturing processes
- Determining 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.

### COURSE TEXTBOOK

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

### SUPPLEMENTARY READINGS

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

## COURSE CONTENT & WEEKLY SCHEDULE

Week	Topics	Assessment Methods, %
WK1	Course Policy, Introduction	Quizzes: 15% Lab Reports: 20% Midterm Exam: 20% Final Exam: 25% Term Project: 20%
WK2	Structure of Materials	
WK3	Properties of Materials, Material Selection	
WK4-6	Casting Processes	
WK7	Metal Forming Processes I	
MTW1-2	Midterm Exams	
WK8	Metal Forming Processes II	
WK9	Machining Processes	
WK10	Abrasive Machining & Finishing Processes	
WK11	Welding Processes	
WK12	Processing of Plastics	
WK13	Additive Manufacturing & Review	
FW1-2	Final Exams	

## CONTRIBUTION OF THE COURSE TO MEETING THE REQUIREMENTS OF CRITERION 5

Mathematics and Basic Sciences	-
Engineering Topic	4 (contains significant design)
Other	-

## RELATIONSHIP OF COURSE TO STUDENT OUTCOMES

Student Outcomes	Level of Contribution		
	NO	Moderate	High
1. an ability to identify, formulate, and solve complex problems by applying principles of engineering, science, and mathematics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. an ability to communicate effectively with a range of audiences	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" 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 type="checkbox"/>	<input checked="" type="checkbox"/>
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" 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 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. 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 **MAY** 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.

## DETAILED WEEKLY COURSE SCHEDULE

IENG263 - Materials and Manufacturing Processes Spring 2021/22 Term Plan					
Week	Week Commencing	Slides	Module	Textbook Ref.*	Complete
WK1	28-Feb	L00 & L01	Course Policy, Introduction	Chapter 1	
WK2	07-Mar	L02	Structure of Materials	Chapter 2	
WK3	14-Mar	L03	Properties of Materials, Material Selection	Chapter 3	
WK4	21-Mar	L04	Casting Processes I	Chapter 10	Quiz 1
WK5	28-Mar	L05	Casting Processes II	Chapter 11	
WK6	04-Apr	L05	Casting Processes II	Chapter 11	
WK7	11-Apr	L06	Metal Forming Processes I	Chapter 17	Quiz 2
MTW	18-Apr	<b>Midterm Exams</b>			
MTW	25-Apr				
WK8	02-May	L07	Metal Forming Processes II	Chapters 18 & 19	
WK9	09-May	L08	Machining Processes	Chapter 21	
WK10	16-May	L09	Abrasive Machining & Finishing Processes	Chapter 24	Quiz 3
WK11	23-May	L10	Welding Processes	Chapter 29	
WK12	30-May	L11	Processing of Plastics	Chapter 13	
WK13	06-Jun	L12	Additive Manufacturing & Review	Chapter 32	Quiz 4
FW	13-Jun	<b>Final Exams</b>			
FW	20-Jun				
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.