



# Course Specification

— (Bachelor)

**Course Title:** Modern Manufacturing Technology

**Course Code:** 462-MEC-3

**Program:** Bachelor of Science in Engineering

**Department:** Mechanical Engineering

**College:** College of Engineering

**Institution:** Najran University

**Version:** 1.0

**Last Revision Date:** 27 February 2024



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## A. General information about the course:

### 1. Course Identification

1. Credit hours: (3)

#### 2. Course type

A.  University  College  Department  Track  Others  
 B.  Required  Elective

3. Level/year at which this course is offered: (Fifth Year \ Level 9)

#### 4. Course general Description:

This course aim to provide the student by the fundamental principles of manufacturing processes, the advantages and disadvantages of manufacturing process, safety in industrial manufacturing equipment, materials, and processes. Moreover, introduce to the materials of production processes and its effect of processes on material properties. Identify the basic types of measuring tools and instruments, hand working, casting, forming, joining processes. introduce to CNC machines, 3D Printing.

#### 5. Pre-requirements for this course (if any):

261-MEC-3 (MANUFACTURING PROCESSES)

#### 6. Co-requisites for this course (if any):

NIL

#### 7. Course Main Objective(s):

- 1.Introduce the student to processes and equipment utilized in the manufacturing environment.
- 2.Compare and contrast different material types and their application.
- 3.Introduce the concepts of production monitoring and control processes.
- 4.Explain different forms of production logistics in a manufacturing process.

### 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid		



No	Mode of Instruction	Contact Hours	Percentage
	<ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4	Distance learning		

### 3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	30
3.	Field	
4.	Tutorial	
5.	Others (specify)	
<b>Total</b>		<b>60</b>

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Define different properties of engineering materials, define basic classification of metals and their effect on properties and identify different types of polymers and their properties.	1	TS:1-Interactive lectures using PowerPoint slides TS:2- Engaging the students in problem-based learning through tutorials TS: 3 – Associating the topics in each chapter with the CLO. TS:4 – Conducting quizzes from each chapter TS:5 – Giving more example programs in the lecture TS: 6 – Discussion with the students in the class hours	-Test performance evaluation -Evaluation of participation in discussion and group assignments



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.2	Define manufacturing concepts and basic classification for manufacturing processes	7	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Giving more assignment from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<p>-Test performance evaluation</p> <p>-Evaluation of participation in discussion and group assignments</p>
<b>2.0</b>	<b>Skills</b>			
2.1	The ability to examine data, ideas, issues and arguments; understand and evaluate assumptions and evidence; and reach logically valid conclusions	2	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Conducting quizzes from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<ul style="list-style-type: none"> <li>•Locally Developed Exams such as Quiz, Mid &amp; Final Exams with scoring rubrics</li> <li>•Assignments involving critical and logical thinking questions</li> <li>•Quizzes</li> </ul>





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	Explain the operations and capabilities of automated machines used in manufacturing and interpret the functionality of base lining and documentation in a manufacturing process	6	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Conducting quizzes from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<ul style="list-style-type: none"> <li>•Locally Developed Exams such as Quiz, Mid &amp; Final Exams with scoring rubrics</li> <li>•Assignments involving critical and logical thinking questions</li> <li>•Quizzes</li> </ul>
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1	The ability to confidently communicate in writing, speaking, reading and listening and coherently for a specific purpose and audience, while using and acknowledging sources effectively	3	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based learning through tutorials</p> <p>TS: 3 – Associating the topics in each chapter with the CLO.</p> <p>TS:4 – Conducting midterm and Final Exam from each chapter</p> <p>TS:5 – Giving more example programs in the lecture</p> <p>TS: 6 – Discussion with the students in the class hours</p>	<p>Locally Developed Exams such as Quiz, Mid &amp; Final Exams with scoring rubrics</p> <ul style="list-style-type: none"> <li>•Assignments involving critical and logical thinking questions</li> <li>•Quizzes</li> </ul>





## C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to manufacturing and Physical and mechanical properties of materials	8
2.	Classification of materials, metals and their alloys.	8
3.	Polymers and composites	8
4.	Metal casting, mold and riser design, die casting	8
5.	Metal forming (Rolling, Extrusion, Drawing and sheet metal work)	8
6.	Machining operations, Tool life and materials	6
7.	Joining operations, Shaping of plastics	6
8.	CNC machines, 3D Printing.	8
<b>Total</b>		<b>60</b>

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	1-10	10%
2.	Quizzes	1-10	10%
3.	Mid-term	4 & 8	20%
4.	labs	1-10	10%
5.	Final exam	15	50%

\*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

<b>Essential References</b>	T.F. Waters and F. Waters, "fundamentals of Manufacturing for Engineers", Taylor & Francis, Latest Edition
<b>Supportive References</b>	Roy A. Lindberg, 'Process and materials of manufacturing', Allen and Bacon, Latest edition -E. Paul DeGarmo, et.al, "Materials and process in manufacturing", Prentice Hall, latest edition. -L.E. Doyle, et.al, "Manufacturing process and materials for engineers", Prentice Hall, latest edition.
<b>Electronic Materials</b>	Online custom books
<b>Other Learning Materials</b>	NA



## 2. Required Facilities and equipment

Items	Resources
<b>Facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
<b>Technology equipment</b> (projector, smart board, software)	--
<b>Other equipment</b> (depending on the nature of the specialty)	--

## F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Program Leaders and Peer Reviewer	Direct, Indirect
Effectiveness of Students assessment	Students & Faculty	Direct and Indirect
Quality of learning resources	Students & Faculty	Direct and Indirect
The extent to which CLOs have been achieved	Students & Faculty	Direct and Indirect
Other		

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

<b>COUNCIL /COMMITTEE</b>	DEPARTMENT OF MECHANICAL ENGINEERING
<b>REFERENCE NO.</b>	
<b>DATE</b>	27/02/2024

