



Course Specification

— (Bachelor)

Course Title: Manufacturing Processes

Course Code: 261-MEC-3

Program: Bachelor of Science in Engineering

Department: Mechanical Engineering

College: College of Engineering

Institution: Najran University

Version: 1.0

Last Revision Date: 02/27/2024



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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: Third Year \ Level 6

4. Course general Description:

4. Course general Description

Introduction to Machine Tools, Classification of Machine Tools, Lathe and Milling Machine Tools, Their Working Principles and Applications, Drilling Machine Tools and Its Classification with Application. Welding and its Classification, AC and DC Welding, Gas Welding, Soldering and Brazing, Resistance Welding, TIG and MIG Welding. Casting Processes: Pattern and Mould, Types and Characteristics, Pattern Allowances, Different Types of Castings. Mechanics of Metal Cutting, Chip and its Types, Chip Breakers, Forces and friction acting on Cutting Tool, Cutting Tool Geometry, Temperature distribution on Cutting Tools. Introduction to Processes such as Extrusion, Drawing, Punching & Blanking, Forging, Rolling.

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

101-MEC-3(Mechanical Engineering Drawing)

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

NIL

7. Course Main Objective(s):

1. Discriminate between different types of machine tools and their working principles.
2. Identify the basic concepts of different welding processes.
3. Illustrate the process of casting and pattern making.
4. Discriminate the mechanics of metal cutting and chip formation on different machine tools.
5. Interpret the basics of forming processes.

2. Teaching mode (mark all that apply)





No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	60	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> • Traditional classroom • E-learning 		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45
2.	Laboratory/Studio	15
3.	Field	
4.	Tutorial	
5.	Others (specify)	
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	Define different manufacturing processes, their features and areas of applications	1	<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>-Test performance evaluation</p> <p>-Evaluation of participation in discussion and group assignments</p>





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<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>	
1.2	Compare the advantages and limitations of different 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>
...				
2.0	Skills			
2.1	Differentiate between different types of manufacturing processes.	2	<p>TS:1-Interactive lectures using PowerPoint slides</p> <p>TS:2- Engaging the students in problem-based</p>	<p>•Locally Developed Exams such as Quiz, Mid & Final Exams</p>



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>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>	<p>with scoring rubrics</p> <ul style="list-style-type: none"> •Assignments involving critical and logical thinking questions •Quizzes
2.2	Analyze products with respect to manufacturing processes and Do experiment on new product to understand it	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"> •Locally Developed Exams such as Quiz, Mid & Final Exams with scoring rubrics •Assignments involving critical and logical thinking questions •Quizzes
...				
3.0	Values, autonomy, and responsibility			





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Demonstrate students' projects by research and communicate with each other's to present their idea.	5	<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 & Final Exams with scoring rubrics</p> <p>•Assignments involving critical and logical thinking questions</p> <p>•Quizzes</p>
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to manufacturing processes	8
2.	Casting processes	8
3.	Bulk deformation processes: Rolling, Forging, Extrusion, and wire/tube Drawing	8
4.	Sheet metal working: deep drawing, blanking and punching ... etc.	8
5.	Principles of metal cutting	8
6.	Joining processes	6
7.	Rapid manufacturing	6
8.	Processing of powder of polymers, metals and ceramics	8
Total		60





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

Essential References	Fundamentals of Metal Machining & Machine Tools by Geoffrey Boothroyd, McGraw Hill International Book, 1988
Supportive References	1.Manufacturing Processes by B. S. Raghuwanshi, Dhanpat Rai & Co. Publications 2.Manufacturing Processes (Vol. I & II) by H. S. Bawa, Tata McGraw Hill Publications
Electronic Materials	Online custom books
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms and laboratories
Technology equipment (projector, smart board, software)	--
Other equipment (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



Assessment Areas/Issues	Assessor	Assessment Methods
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

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

