هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Manufacturing Processes عمليات التصنيع**
Course Code:	**INE 3312**
Program:	**Bachelor of Industrial Engineering**
Department:	**Industrial Engineering Department**
College:	**College of Engineering**
Institution:	**King Khalid University**
Version:	**1**
Last Revision Date:	**1 *October 2025***

Table of Contents

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: (Level 5/year 3)					
4. Course General Description:					
This course covers fundamentals of manufacturing processes including interrelationships between the properties of the material and the manufacturing process under the classification of processing operations and the basic parameters involved in these processes. This course will focus on basic manufacturing processes of metal forming, forging, rolling, extrusion, wire drawing, tube drawing and making. The course will cover other topics in manufacturing process such as press-work and die-punch assembly and casting. This course will also cover standard inspection and measurement techniques and how they are used in manufacturing process. Practical experience from selected manufacturing sample parts is expected in this course.					
5. Pre-requirements for this course (if any):					
Production Technology and Workshop ME 2315					
6. Co-requisites for this course (if any):					
Manufacturing Systems INE 3313					
7. Course Main Objective(s):					
To make students able to understand, define, classify, design, and analyze different types of manufacturing processes. Practical experience from selected manufacturing sample parts is expected in this course.					

2. Teaching mode (mark all that apply)

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

3. Contact Hours (based on the academic semester)

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

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

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understand and recognize the different manufacturing processes, concept, capabilities process parameters, process optimization, and the advantages and limitations of various processes.	K 1, K2	Lectures and Tutorial	Assignments/ Quizzes/ Activities Midterm exam/ Practical exam / Final test/ presentation
1.2	Define, explain and evaluate the behavior and properties of materials as they are altered and influenced by processing in manufacturing.	**K3**		
…				

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
2.0	**Skills**			
2.1	Apply appropriate techniques, Propose suitable manufacturing process to produce a part from different available alternatives and required quality inspection.	S1	Lectures and Tutorial	Assignments/ Quizzes/ Midterm exam/ Practical exam / Final test/ presentation
2.2	Use suitable materials according to the application and manufacturing process.	S 2	Lectures and Tutorial	Assignments/ Activities Quizzes/ Midterm exam/ Practical exam / Final test/ presentation
2.3	Implement critical thinking and creative solutions for real parts. Carry out and Perform sample parts by selected manufacturing process	S 3	Lectures and Tutorial	Assignments/ Activities / presentation Quizzes/ Midterm exam/ Practical exam / Final test
3.0	**Values, autonomy, and responsibility**			
3.1	Work individually or within a team and communicate effectively to perform the assigned tasked (Homework/Practical activity / Group presentation)	V4		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to manufacturing (manufacturing a product: general considerations, choosing methods of manufacturing, classification of	6

	manufacturing processes, introduction to deformation process, polymer, plastic and sheet metal)	
2.	Materials and manufacturing (introduction to material properties, important engineering characteristics of materials, material-process-geometry relationships, functional parameters of mechanical and thermal properties affected by production processes).	6
3.	Measurement and inspection (linear measurement metric system (millimeters), gages, graduated measuring devices, shape, dimensions, shape and location deviations, measurement instruments inspection tools and techniques, machined parts surface roughness measurements, stylus, optical devices SEM, introduction to nondestructive testing methods, common application/uses of NDT, automated inspection).	6
4.	Basic metal forming process and use (advantages of mechanical working processes, difference between hot and cold working, advantages and disadvantages of cold and hot working processes, classification of metal forming processes according to type of stress employed).	6
5.	Forging Process (classification of forging, die forging with power hammers (open, impression, closed die forging, machine forging, and forging defects).	6
6.	Rolling Process (nomenclature of rolled products, mechanism of rolling, types of rolling mills, rolls and roll pass design, ring rolling, cold rolling, rolling defects)	6
7.	Extrusion, wire drawing, tube drawing and making (extrusion processes, machines for extrusion, extrusion defects, wire drawing, tube drawing, tube making).	6
8.	Press work and die-punch assembly (tools, other operations performed with (presses, bending, deep drawing, coining and embossing coining).	6
9.	Casting process (types of patterns, molding sand and its properties).	6
10.	Welding Processes	6
Total		60

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	4 Assignments	2, 4, 6, 8	15
2.	2 Quizzes	5, 9	
3.	4 Activities	3,6, 10, 11, 13	
4.	Practical exam	16	15
5.	2 Mid Term Exams	7, 12	30
6.	Final Exam	19	40
	Total		100

*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	Youssef, H. A., El-Hofy, H. A., & Ahmed, M. H. (2023). *Manufacturing technology: materials, processes, and equipment*. Crc Press.
Supportive References	El Wakil, S. D. (2025). *Processes and design for manufacturing*. CRC press. Herfurth, K., & Scharf, S. (2021). Casting. In *Springer Handbook of Mechanical Engineering* (pp. 325-356). Cham: Springer International Publishing.
Electronic Materials	*Lecture notes on blackboard*
Other Learning Materials	Kridli, G. T., Friedman, P. A., & Boileau, J. M. (2021). Manufacturing processes for light alloys. In *Materials, design and manufacturing for lightweight vehicles* (pp. 267-320). Woodhead Publishing.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	*Classrooms, laboratories*
Technology equipment (projector, smart board, software)	*Projector, smart board*
Other equipment (depending on the nature of the specialty)	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	*Students*	*Indirect (Questionnaire)*
Effectiveness of Students assessment	*Faculty*	*Direct*
Quality of learning resources	*Program Leaders*	*Direct*
The extent to which CLOs have been achieved	*Faculty*	*Direct*
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**REVIEWED BY CURRICULUM COMMITTEE** **APPROVED BY QUALITY COMMITTEE**
REFERENCE NO.	**9-6-47**

DATE	**25/06/1447**