Course Specification
(Bachelor)

Course Title:	**Manufacturing Systems**
Course Code:	**INE 3313**
Program:	Bachelor of Industrial Engineering
Department:	Industrial Engineering
College:	Engineering
Institution:	**King Khalid University**
Version:	**1**
Last Revision Date:	17 Nov 2025

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 hours)					
2 hours theory + 2 hours tutorial					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (L6/3rd year)					
4. Course general Description:					
The aim of the course is to introduce the students to the fundamental of manufacturing systems, understanding the industrial control systems and their components and understanding AHS and AS/RS and their integration with manufacturing systems, and ability to specify, select and design those systems. Topics in this course will cover: 1- Manufacturing Operations, Models and Metrics. 2- Single-station manufacturing cells, 3- Machine clusters, 4- Single model and Mixed model of manual assembly lines. 5. Automated Production & Assembly Lines. 6. Flexible Manufacturing Systems. For the previous manufacturing systems, ability to design, specify them and calculate their requirement.					
5. Pre-requirements for this course (if any)**:**					
INE 3312					
6. Co-requisites for this course (if any)**:**					
NIL					
7. Course Main Objective(s):					
The aim of the course is to introduce the students to the fundamental of manufacturing systems, understanding the industrial control systems and their components and understanding AHS and AS/RS and their integration with manufacturing systems, and ability to specify, select and design those systems. Topics in this course will cover: 1- Manufacturing Operations, Models and Metrics. 2- Single-station manufacturing cells, 3- Machine clusters, 4- Single model and Mixed model of manual assembly lines. 5. Automated Production & Assembly Lines. 6. Flexible Manufacturing Systems.					

For the previous manufacturing systems, ability to design, specify them and calculate their requirement.

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 CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Understanding Manufacturing Operations, Models and Metrics	K1	Lectures and tutorials	Assignments Midterm Exam Final Exam
1.2	Understanding Single-station manufacturing cells, Machine clusters manufacturing, Manual Assembly Lines, Mixed model assembly lines, Automated production lines, Automated assembly lines Flexible manufacturing Systems, and ability to	K3		

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	specify, select and design them.			
2.0	**Skills**			
2.1	Use and mange various manufacturing systems	S3	Lectures and tutorials	Assignments Midterm Exam Final Exam
2.2	Estimate and evaluate different manufacturing systems	S2		
2.3	Select and Design suitable manufacturing system for different type of production	S4		
2.4	Apply known methods to solve real manufacturing and production problems	S4		
3.0	**Values, autonomy, and responsibility**			
3.1	Work individually or within a team and communicate effectively to perform the assigned tasked (Homework/Group Project)	V2	Lectures and tutorials	Projects Presentations
3.2	Communicate effectively during presentations	V4		

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction, Manufacturing operations and metrics, Manufacturing economics	8
2.	Single-Station Manufacturing Cells - I	4
3.	Single-Station Manufacturing Cells – II (Machine clusters)	4
4.	Manual Assembly Lines	8
5.	Line Balancing Problem	4
6.	Batch Model Assembly Line	8
7.	Mixed Model Assembly Lines	8
8.	Automated Production Line	8
9.	Automated Assembly systems	4
10.	FMS - Systems	4
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	6 to 8 Assignments	2, 3, 4, 5, 6, 7, 8, 9	30
2.	Quiz 1	7	
3.	Quiz 2	12	
4.	Mid Term Exam	7	30
5.	Final Exam	16	40
...			**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	Automation, Production Systems, and Computer Integrated Manufacturing, Mikell Groover,5Ed, Prentice Hall, 2019, ISBN-13: 9780134605463 (2018 update).
Supportive References	• Manufacturing Facilities: Location, Planning, and Design, Third Edition, Dileep R. Sule, CRC Press, 2008. • Manufacturing Facilities Design and Material Handling, Fred E. Meyers and Mathew Stephens, 2005, Pearson Prentice Hall, New Jersey, ISBN 0-13-112535-4. • Computer-Integrated Design and Manufacturing, Nanua Singh, John Wiley & Sons. • Operations Management for Competitive Advantage [10th Edition], Chase & Jacobs & Aquilano
Electronic Materials	Course page on Blackboard
Other Learning Materials	Lecture handouts

2. Required Facilities and equipment

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

Items	Resources
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 Reviewer, 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**