



# Course Specifications

<b>Course Title:</b>	<b>Design of Manufacturing Systems</b>
<b>Course Code:</b>	<b>ME 486</b>
<b>Program:</b>	<b>Mechanical Engineering (UG)</b>
<b>Department:</b>	<b>Mechanical &amp; Industrial Engineering</b>
<b>College:</b>	<b>College of Engineering</b>
<b>Institution:</b>	<b>Majmaah University</b>

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## A. Course Identification

<b>1. Credit hours:03</b>
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input type="checkbox"/> Elective <input checked="" type="checkbox"/>
<b>3. Level/year at which this course is offered: 10</b>
<b>4. Pre-requisites for this course (if any): ME 475</b>
<b>5. Co-requisites for this course (if any): None</b>

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	80
2	Blended	0	10
3	E-learning	0	10
4	Correspondence	0	0
5	Other	0	0

### 7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
<b>Contact Hours</b>		
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	15
4	Others (specify)	0
	<b>Total</b>	<b>75</b>
<b>Other Learning Hours*</b>		
1	Study	30
2	Assignments	10
3	Library	10
4	Projects/Research Essays/Theses	05
5	Others (specify)	--
	<b>Total</b>	<b>55</b>

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

<b>1. Course Description</b> Study of recent developments in manufacturing, Japanese manufacturing techniques, hybrid manufacturing management system, supply chain management, total quality management, design for manufacturing and assembly. Manufacturing automation fundamentals and strategies; High volume manufacturing systems; Automated handling and storage systems; Automated inspection systems; Flexible manufacturing systems; Modeling of manufacturing systems.
<b>2. Course Main Objective</b>
1. To know importance of Manufacturing Systems
2. To gain detailed knowledge in three areas: manufacturing processes and computer-integrated manufacturing systems
3. To learn manufacturing management strategies

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge:</b>	
1.1	Recognize applicability of manufacturing systems	a
1.2	Outline and describe with use of appropriate techniques to optimize components in manufacturing and supply chain systems	a
<b>2</b>	<b>Skills :</b>	
2.1	Capabilities to demonstrate machine loading	e
2.2	An ability to explain and apply design concepts in solving problems related to maximal flow optimal distances	e
<b>3</b>	<b>Competence:</b>	
3.1	Ability to involve group based assignment, to demonstrate so that they share with classmates and teachers, help of internet for solving it.	k
3.2	Group tasks and projects to work with teams to appraise the issues	k

## C. Course Content

No	List of Topics	Contact Hours
1	Current developments in manufacturing, Japanese manufacturing systems, High volume manufacturing systems	10
2	Supply chain management	10
3	Inspection systems Total quality management	20
4	Flexible manufacturing systems Automated handling and storage systems, Automation strategies	20
5	Modeling manufacturing system,	15
<b>Total</b>		<b>75</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge</b>		
1.1	Recognize applicability of manufacturing systems	Formal face to face lectures to focus on strategies and principles of manufacturing systems	a
1.2	Outline and describe with use of appropriate techniques to optimize components in manufacturing and supply chain systems	Formal face to face lectures optimization on machine loading, sequencing	a
<b>2.0</b>	<b>Skills</b>		
2.1	Capabilities to demonstrate machine loading	Allowing students to think to solve the problems in groups to exchange their thought and reinforce the correct.	e
2.2	An ability to explain and apply design concepts in solving problems related to maximal flow optimal distances	Asking them formulae, equations used and how can they apply their skills for a specific type of problem and mending the mistakes with explanation	e
<b>3.0</b>	<b>Competence</b>		
3.1	Ability to involve group based assignment, to demonstrate so that they share with classmates and teachers, help of internet for solving it.	Making teaching learning two-way communication. Getting students involved to solve problems and asking students did they understand the stability concept clearly.	k
3.2	Group tasks and projects to work with teams to appraise the issues	A seminar component related to topic may be considered. Consultations with the lecturer outside of class hours, according to the scheduled time	k

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Quiz 1	03	05
2	Assignment/Homework	05	05
3	Mid Term 1	07	20
4	Quiz 2	10	05
5	Mid Term2	11	20
6	Assignment/Home work	12	05
7	Final Exam	15	40
	Total	--	100

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

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

Lecture hours as given in Time Tables : Tuesday 8-8:50 AM , 9-9:50 AM,  
Tutorial Tuesday 3 pm 3:50 PM  
(Class Rooms E 1 and E 3)

Office hours : Laboratory Tuesday 11 to 12:50 PM  
:Every day from 10 AM -11 AM  
(Office location 044-02-17)

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	Production System and Computer Integrated Manufacturing, Groover, M.P. Automation, Prentice Hall.
<b>Essential References Materials</b>	Modeling and Analysis of Manufacturing Systems, Askin, R.G. & Standridge, C.R. John Wiley & Sons.  Factory Physics, Hopp and Spearman, Irwin 1996
<b>Electronic Materials</b>	---
<b>Other Learning Materials</b>	Course related material is provided in Black Board

### 2. Facilities Required

<b>Item</b>	<b>Resources</b>
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Class Rooms
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Smart board is provided
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	-----

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of Teaching	Students	Indirect Assessment
CLOs achievement	Faculty	Direct/Indirect Assessments
Learning Resources	Students	Indirect Assessment
Course Contents	Students	Indirect Assessment

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

Council / Committee	Department Council
Reference No.	<b>1/34/9767</b>
Date	<b>25/02/1432 H</b>