



Arab Academy for Science, Technology & Maritime Transport
 College of Engineering & Technology
 Department of Basic and Applied Science

University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

**Form No. (12)
 Course Specification**

1- Course Data

Course Code: IM 212	Course Title: Manufacturing Process	Academic Year/Level: 2nd year / 4th semester
Specialization:	No. of Instructional Units	Lecture
	3 Credits	2 Hrs.
		Practical
		2 Hrs.

2-Course Aim

The course introduces the basic principles of metal cutting, cutting parameters and their effect on different operations. It also provides knowledge about different conventional and non-conventional metal cutting operations.

3- Intended Learning Outcome (ILO's)

<p>a- Knowledge and Understanding</p>	<p>K4) Principles of design including elements design, process and/or a system related to specific disciplines.</p> <ul style="list-style-type: none"> - Define basic machining fundamentals. - Illustrate the potential application of different types of tool geometry and material on the accuracy and surface quality. - Identify fundamentals of chip formation mechanisms and phenomena. - Illustrate the principles of cutting forces heat generation during machining operations. - Define concepts and fundamentals of geometric tolerances. <p>K5) Methodologies of solving engineering problems, data collection and interpretation</p> <ul style="list-style-type: none"> - Identify basic concepts of metrology and their applications and effect on accuracy of manufacturing operations. - Identify coordinate systems and datums for machine tools. <p>K8) Current engineering technologies as related to disciplines.</p> <ul style="list-style-type: none"> - Define turning operation parameters, processes & applications - Define milling operation parameters, processes & applications - Define operations parameters, processes & applications for shaping, planning, drilling and boring operations. - Define milling operation parameters, processes & applications of broaching operation. - Define non-traditional machining concepts. - Define non-traditional machining concepts.
<p>b- Intellectual Skills</p>	
<p>c- Professional Skills</p>	
<p>d- General Skills</p>	

4- Course Content

Lecture		
Wk	Hrs	
1	2	Theory of Metal Cutting-introduction
2	2	Cutting Tools Geometry- Cutting tools materials
3	2	Chip Formation mechanisms- Phenomena accompanying chip formation
4	2	Cutting forces; components, measurements.
5	2	Turning operation
6	2	Milling operation
7	2	7 th week exam
8	2	Shaping, Planning, Slotting operations-Drilling, boring operations.
9	2	Broaching operation
10	2	Geometric tolerances calculation
11	2	Accuracy of manufacturing- accuracy of measurements and metrology principles
12	2	12 th week exam
13	2	overview, Coordinate systems and datums
14	2	introduction to non traditional manufacturing- Electrical discharge machining
15	2	Electro chemical, Laser, Electron beam, ultrasonic manufacturing methods.
16	2	Final Exam

5- Teaching and Learning Methods

<ol style="list-style-type: none"> 1. Lectures 2. Tutorials 3. Individual and group coursework 4. Project group technical reports Individual and group projects

6- Teaching and Learning Methods for Students with Special Needs

<ol style="list-style-type: none"> 1. Consulting with lecturer during office hours 2. Consulting with teaching assistant during office hours 3. An academic supervisor is appointed for 4. handicapped students. Constant follow ups are done for handicapped students after each assessment to evaluate their academic level of achievement.

7- Student Assessment

a- Procedures used:	1. Written examinations to assess the Intended learning outcomes. Continuous assessment (reports, discussions, etc.....).
b- Schedule:	Assessment 1: 7 th Week Written Exam Assessment 2: 12 th Week Written Exam Assessment 3: Continuous Assessments Assessment 4: 16 th Week Final Written Exam
c- Weighing of Assessment:	7 th Week Examination : 30 % 12 th Week Examination: 20 % Final-term Examination: 40 % Oral Examination : 5 % Semester Work : 5 % Total : 100%

8- List of References:

a- Course Notes	
b- Required Books (Textbooks)	Hassan El-Hofy, "Fundamentals of Machining Processes", CRC Press, latest edition.
c- Recommended Books	Daniel B. Dallas, "Tool and Manufacturing Engineers Handbook", McGraw Hill, latest edition.
d- Periodicals, Web Sites, ..., etc.	

Course coordinator:

Program Manager: