

## Course Specifications

**University: Benha University**

**Faculty: High Institute of Technology**

### Course specifications

Programme(s) on which the course is given	Mechanical Engineering
Major or minor element of programmes	Mechanical Engineering
Department offering the programme	Mechanical Engineering
Department offering the course	Mechanical Engineering
Academic year / Level	First semester, 1 <sup>st</sup> year in mechanical engineering
Date of specification approval	

## A- Basic Information

**Title: Principles of Manufacturing Code: M271**

**Credit Hours: 2**

**Lecture: 2**

**Tutorial: 1**

**Practical: 0**

**Total: 3**

## B- Professional Information

### 1 - Overall aims of course

By the end of this course students will be able to demonstrate knowledge of the main types of the engineering materials and their properties, the basic machining processes and their capabilities, and appreciate the importance of the selection of the process, material, and level of accuracy on the success of the making and functioning of an industrial product.

### 2- Intended learning outcomes of course (ILOs)

#### a. Knowledge and understanding:

- a.1 List the main types of engineering materials and their mechanical and physical properties

- a.2 Describe the methods and equipment used in testing the properties of the engineering materials
- a.3 List the basic types of machining processes, operations performed with them, and the types of products that can be made by the various operations
- a.4 Define the capabilities of the basic machining processes
- a.5 Explain the basic calculations involved in setting and using the basic machining process
- a.6 Describe the significance of accuracy in machining processes
- a.7 Define the types of engineering fits and tolerances and their importance in manufacturing
- a.8 Relate the type of materials and properties to their suitability for use and performance in the general manufacturing applications
- a.9 Relate the capabilities of the machining processes, properties of the materials to the expected level of accuracy and surface finish of products

**b. Intellectual skills**

- b.1 Select the suitable machining operation for the various engineering products
- b.2 Suggest the suitable materials for the different parts and uses

**c- Professional and practical skills**

- c.1 Perform the necessary calculations in setting the machining operations
- c.2 Interpret the necessary settings of machining operations to meet the accuracy and functional design specifications
- c.3 Design machining processing plans of simple engineering parts

**d- General and transferable skills**

- d.1 Seek more information on the usability of engineering materials and machining processes

### 3- Contents

Topic	No. of Hours	Lecture	Tutorial / Practical
Types and behaviors of engineering materials, mechanical and physical properties implications and testing	9	6	3
Basics of machining and the cutting theory, calculations of cutting parameters, metal removal rates, and power consumed in machining of round and non-round shapes	15	10	5
Abrasive and finishing operations, calculating the cutting parameters	6	4	2
Accuracy, surface measurements, and engineering fits and tolerances	7	5	2
Engineering metrology and instrumentations	5	3	2
<b>Total</b>	<b>42</b>	<b>28</b>	<b>14</b>

#### 4– Teaching and learning methods

- 4.1- Lectures and tutorial sessions
- 4.2- Collecting information from library/Internet

#### 5- Student assessment methods

- 5.1 Written exams to assess ILOs a1 through a9, b1, b2, and c1
- 5.2 Quizzes to assess ILOs a1 through a9, b1, b2, and c1
- 5.3 Oral exam to assess ILOs a1 through a9, b1, b2, c1 through c3, and d1
- 5.4 homework to assess ILOs a1 through a9, b1, b2, c1 through c3, and d1

#### Assessment schedule

- Written exams Week 8 (midterm) and the final exam

Quizzes	Weeks 3, 6, 10, 13
Oral exam	Week 15
Homework	Weekly

### **Weighting of assessments**

Mid-term examination	15	%
Final-term examination	60	%
Oral examination	10	%
Homework/Semester work	15	%
Total	100	%

### **6- List of references**

#### 6.1- Course notes

Notes by instructor distributed in class

#### 6.2- Essential books (text books)

Kalpakjian S, Schmid S. 2006. Manufacturing Engineering and Technology.  
PEARSON Prentice-Hall

#### 6.3- Recommended books

Schrader G., Elshennawi A. 2000. Manufacturing Processes and Materials. SME  
Publications

Amstead B., Ostwald P., Begeman M. 1998. Manufacturing Processes. Wiley

#### 6.4- Periodicals, Web sites, ... etc

Internet Encyclopedia: <http://en.wikipedia.org/wiki/Manufacturing>

Engineering Fundamentals website:

[http://www.efunda.com/processes/processes\\_home/process.cfm](http://www.efunda.com/processes/processes_home/process.cfm)

### **7- Facilities required for teaching and learning**

**Lecturing room with data show equipment**

**Course coordinator: Dr. Magdy Helal**

**Head of Department:: Asoc Prof. Sameh Nada**

**Date: Aug 24, 2009**