Course Specifications

University: Benha University  Faculty: High Institute of Technology

Course specifications
Programme(s) on which the course is given: Mechanical Production Engineering
Major or minor element of programmes
Department offering the programme: Mechanical Engineering
Department offering the course: Production Engineering
Academic year / Level: year 3  Mechanical Production Engineering
Date of specification approval

A- Basic Information

Title: Manufacturing Technology  Code: M364
Credit Hours:  Lecture: 3
Tutorial: 1  Practical: 1  Total: 5

B- Professional Information

1 - Overall aims of course
By the end of the course the students will be able to:

- Demonstrate the theoretical and practical foundations of the different manufacturing technologies in the machining sector.
- recognize and demonstrate the different machining processes (conventional and non conventional),
- recognize all types, mechanisms and applications of machine tools including turning, drilling, boring, milling, shaping, planing, broaching, grinding, special purpose, gear and thread cutting and super finishing machine tools,
- recognize all types of power and motion transmission, machine tools attachments,
- get a basic idea about jigs and fixtures

Student shall attain the above mentioned objectives through lectures, tutorial for problem solving and laboratory for experiments and microscopic examinations
2- Intended learning outcomes of course (ILOs)

a. Knowledge and understanding:
   a.1 Define the cutting processes and its concern
   a.2 Describe machining tools, cutting machines and cutting technologies
   a.3 Understand essential facts, fundamentals, concepts, principles and theories relevant to cutting technology, power transmission in machine tools,
   a.4 Explain the machine tools and jigs and fixtures.

b. Intellectual skills

   b.1 Analyze engineering problems relevant to machining,
   b.2 Solve mechanical and product design in hot and cold working,
   b.3 Creatively solve problems of joining methods.

c- Professional and practical skills

   c.1 Employ computational facilities, measuring instruments, workshops and laboratories equipment to design experiments and collect, analyze and interpret results.
   c.2 Operate and maintain different production machines

3- Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of Hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
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<tbody>
<tr>
<td>Cutting tools (Materials, Geometry, Types and Design)</td>
<td>15</td>
<td>9</td>
<td>6</td>
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<tr>
<td>Forming presses (types, mechanisms and Applications)</td>
<td>20</td>
<td>12</td>
<td>8</td>
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<tr>
<td>Metal cutting machine tools (Turning, Drilling, Boring, Milling, Shaping, planing, Broaching, Grinding, Special purpose, Gear and thread cutting and Super finishing machine tools)</td>
<td>20</td>
<td>12</td>
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<tr>
<td>Power and motion transmission in machine tools</td>
<td>5</td>
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<tr>
<td>Machine tools attachments</td>
<td>20</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Introduction to jigs and fixtures</td>
<td>10</td>
<td>6</td>
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</tbody>
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4– Teaching and learning methods
4.1 - Lectures
4.2 - Problem solving sessions
4.3 - Laboratories

5- Student assessment methods
   5.1 Written exam to assess ILO a1, a2, a3, a4, b1, b2, b3, c1
   5.2 problem solving to assess ILO a3, b1
   5.3 labs to assess ILO c2
   5.4 Report writing to assess ILO a3, b2, c1
   5.5 Oral exam to assess ILO b2, b3

Assessment schedule
   Assessment 1    Written exam    Week 5
   Assessment 2    Written exam    week 10
   Assessment 3    Oral exam      Week 15

Weighting of assessments
   Final-term examination       60 %
   Semester work               10 %
   Practical work              10 %
   Oral exam                   10%
   Total                       100%

6- List of references
   6.1- Course notes
       Course notes of Material technology

   6.2- Essential books (text books)
       Gill, Peter Smid, and Steve Krar - Student Edition

   6.3- Recommended books
       E. Paul DeGarmo, Materials and Processes in Manufacturing, John Wiley &
       Sons Inc, 2005
       Machine Tools Handbook (McGraw-Hill Handbooks) by Prakash Joshi

   6.4- Periodicals, Web sites, … etc
7- Facilities required for teaching and learning
   Lecture rooms
   Classrooms for problem solving sessions
   Materials laboratory

Course coordinator: Prof. Adel Omar
Head of Department: Prof. Sameh Nada
Date:   /   /