Course specifications

Course Description


Programs take this course through their curricula

- Degree of Engineering and Technology in Mechanical Engineering (Production and Power)

Departments offering these programs are:

- Mechanical Engineering

Academic year / Level

- Fifth year

Date of specification approval

- 2008 G.
A- Basic Information

Title: Computer aided manufacturing Code: M 571
Credit Hours: 4 Lecture: 3
Tutorial: 1 Practical: 2 Total: 6

B- Professional Information

1 - Overall aims of course
• Use computing techniques for designing a CNC program
• Manipulate manufacturing with computers
• Learn principles of computer based machining
• Learn programming with G and M codes

2- Intended learning outcomes of course (ILOs)
• Using computers for manufacturing
• Use programming to manipulate milling processes
• Use programming to manipulate Turning processes
• Learn computational programming techniques for manufacturing

a. Knowledge and understanding:
   a.1 Know the professional use of computers in workshop
   a.2 Familiarization with computer controlled cutting machines
   a.3 Know G and M code programming techniques

b. Intellectual skills
   b.1 Using programming for manufacturing a component.
   b.2 Composing machining paths from linear and circular interpolations and make a program to accomplish it.
   b.3 Use simulation systems to making sure of the correctness of the programmed code.

c- Professional and practical skills
   c.1 Making simple and efficient code for manufacturing purposes
   c.2 Develop real experience working skills
d- **General and transferable skills**

   d.1 Gain enough experience to decide on CAM packages  
   d.2 Familiarization with commercially used CAM packages  
   d.3 Develop stand alone programs and pieces of codes for future use

3- **Contents**

<table>
<thead>
<tr>
<th>Topic</th>
<th>No. of Hours</th>
<th>Lecture</th>
<th>Tutorial/Practical</th>
</tr>
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<tbody>
<tr>
<td>Fundamentals of CAM Classification of</td>
<td>3</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Introduction to NC Machine Tools</td>
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<td>1</td>
<td>3</td>
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<tr>
<td>Automated manufacturing Systems (NC, CNC, DNC)</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<tr>
<td>NC Machine Systems</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Manual part Programming</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Computer Part Programming Using APT</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Mini project</td>
<td>9</td>
<td>3</td>
<td>9</td>
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4– **Teaching and learning methods**

   4.1-Direct instruction  
   4.2-Supervised tutoring  
   4.3-Computers laboratory  
   4.4-Project advising  
   4.5-Project manufactured part and report

5- **Student assessment methods**

   5.1Class work grading to assess knowledge and intellectual skills  
   5.2 Quizzes to assess understanding and professional skills  
   5.3 MidTerm to assess intellectual and transferable skills  
   5.4 Project Report to assess intellectual and transferable skills  
   5.5 Final Exam to assess intellectual and transferable skills

**Assessment schedule**
Assessment CW every week
Assessment 2 Quizzes twice or thee time
Assessment 3 Mid Term end of the term
Assessment 4 Mini project end of the term
Assessment 5 Final Exam end of the term

Weighting of assessments

<table>
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<th>Assessment</th>
<th>Weighting</th>
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<tr>
<td>Mid-term examination</td>
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<tr>
<td>Final-term examination</td>
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<tr>
<td>Oral examination</td>
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<tr>
<td>Semester work</td>
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<tr>
<td>Report</td>
<td>10 %</td>
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<tr>
<td>Total</td>
<td>100 %</td>
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6- List of references

- Course notes
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6.2- Essential books (text books)
- Lecture Notes
- Computer Aided Manufacturing, Tien Chienchang, Prentice Hall, 2006

6.3- Recommended books
- Same books

6.4- Periodicals, Web sites, … etc
  - http://engg.kau.edu.sa/~el-assal

7- Facilities required for teaching and learning

Possible E-Learning

Course coordinator: Prof. Dr. Ahmed El-Assal
Head of Department:
Date: 30 / 6/2009