Course specifications

Course Description
- Introduction and definitions – Role of computers in synthesis and Analysis – Geometry description and parametric geometry – Solid modeling – Optimization – Introductions to finite Method – Applications of CAD – Computers in of analysis..

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
- Fourth year

Date of specification approval
- 2008 G.
A- Basic Information
Title: Computer Aided Design  
Code: M 472  
Credit Hours: 3  
Lecture: 3  
Tutorial: 4  
Practical: 4  
Total: 11

B- Professional Information
1 - Overall aims of course
- Use computing techniques for designing a part of mechanical system
- Manipulate graphics with computers
- Use optimization techniques for design
- Learn principles of finite elements
- Learn programming with MatLab for programming different tasks

2- Intended learning outcomes of course (ILOs)
- Using computers for design calculations
- Use programming to manipulate graphics
- Learn optimization techniques for design and write programming code to perform it
- Learn computational techniques for design
- Work within a group in a mini-project

a. Knowledge and understanding:
   a.1 Know the professional use of computers
   a.2 Know the professional use of computing techniques
   a.3 Familiarization with computational techniques for design
   a.4 Know optimization techniques

b. Intellectual skills
   b.1 Using programming for designing a component or system
   b.2 Composing objective function and make a program to solve it.
   b.3 Use computers for achieving a complete design and perform possible checks at critical positions for safe and working design
   b.4 Simulation of systems
c- Professional and practical skills
   c.1 Making simple and efficient code for designing purposes
   c.2 Develop team working skills

d- General and transferable skills
   d.1 Gain enough experience to decide on CAD packages
   d.2 Familiarization with commercially used CAD 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>
</thead>
<tbody>
<tr>
<td>Computers and computing</td>
<td>6</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Graphics</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Parametric geometry</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Solid modeling</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Optimization</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Simulation</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Finite elements</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mini project</td>
<td>6</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

4- Teaching and learning methods
   4.1 Direct instruction
   4.2 Supervised tutoring
   4.3 Computers laboratory
   4.4 Project advising
   4.5 Project report

5- Student assessment methods
   5.1 Class 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>
<thead>
<tr>
<th>Assessment</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-term examination</td>
<td>10 %</td>
</tr>
<tr>
<td>Final-term examination</td>
<td>60 %</td>
</tr>
<tr>
<td>Oral examination</td>
<td>10 %</td>
</tr>
<tr>
<td>Semester work</td>
<td>10 %</td>
</tr>
<tr>
<td>Report</td>
<td>10 %</td>
</tr>
<tr>
<td>Total</td>
<td>100 %</td>
</tr>
</tbody>
</table>

6- List of references

- Principles of Computer Aided Design and Manufactur, Farid Amirouche, Prentice Hall, 2004

6.2- Essential books (text books)

- Lecture Notes

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