Course name: MCE 530 - Advanced Computer Aided Design

Department: Mechanical Engineering

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<th>Semester</th>
<th>Methods of Education</th>
<th>Credit (ECTS)</th>
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<td>Lecture</td>
<td>Recitation/ (Etude)</td>
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<td>Fall/Spring</td>
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Language: English

Compulsory/Elective: Elective

Prerequisites: None

Course Contents: Sketcher, Part Design, Generative Shape Design, Weld Design, Sheet Metal, Assembly Modelling, Drafting, Analysis, Simulation, CosmosMotion

Course Objectives:
The purpose of this course, graduate students Solidworks, Unigraphics, Catia and so on, modeling of complex systems using computer-aided design software and give information at an advanced level on performing of systems engineering analysis.

Learning Outcomes and Competences:
1. Understand the importance of industrial design.
2. Learn the differences between 2D/3D modeling software.
3. Perform a 3D design of complex systems.
4. Create manufacturing drawings of the 3D models.
5. It can make analysis of system components and simulate of the system.

Textbook and/or References:

Assessment Criteria:
If any, mark as (X) | Percentage (%)
---------------------|------------------
Midterm Exams        | X                | 30
Quizzes              |                  |
Homeworks            |                  |
Projects             | X                | 20
Term Paper           |                  |
Laboratory work      |                  |
Other                |                  |
Final Exam           | X                | 50

Instructors:
Assist. Prof. Dr. Ihsan TOKIEŞ

Week | Subject
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1    | The aim of the course, the content and scope, the concept of computer-aided industrial design and production
2    | Solidworks interface:
    | Sketcher:
    | a. Main and auxiliary commands
    | b. Create a 2D drawing
    | c. Using the parametric SolidWorks
    | d. Stages of 2D drawing
    | e. Dimensioning editing
3    | Part Design:
    | a. Basic Modeling Commands
    | b. Boss through the creation of solid (Extrude)
    | c. Creating a rotating solid (Revolve)
    | d. Creating a sweeping solid with the help of a road and profiles
    | e. To create solid by switching between profiles (Loft)
    | f. Hole wizard
    | g. Keyboard shortcuts
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<td>Generative Shape Design.</td>
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|5 | Weld Design.  
Sheet Metal. |
|6 | Assembly Modelling:  
a. Calling the assembly page  
b. Standard Mate and Advanced Mate commands  
c. Assembly fault detection  
d. Assembly operation (simulation)  
e. Assembly made into animation as avi Saving |
|7 | Midterm Exam  
Implementation of the basic mechanisms of animation. |
|8 | Drafting:  
a. Part removal of appearance  
b. Sectional views taken  
c. Detail and Clipping appearance  
d. Tolerance, treatment of surface and welding observations  
e. The use of geometric tolerances  
f. Datum fetaures ile çalışmak  
g. Dimensioning  
h. Working in blocks  
i. Dimension lines, font settings and standardization of dimensioning arrows  
j. To prepare and to invoke the standard letterhead  
k. The creation of tables of Assembly parts  
l. Create a list of materials |
|9 | Modeling in SolidWorks environment of a system  
Analysis:  
a. Linear stress analysis of a simple piece with Cosmos Works  
b. Thermal analysis of a simple piece with Cosmos Works  
c. Flambaj analysis  
d. Optimization tests  
e. Under all Boundary conditions of the parts designed to be tested  
f. Interpretation of results |
|10 | Simulation:  
a. Identification of Connections of a simple mechanism with the aid of CosmosMotion  
b. Adding friction connections  
c. Values of thrust momentum which must be the result of the collision  
d. Simulation of the mechanism  
e. The value read and interpret tables  
f. Table and results in Excel and. TXT converted into a document are retained |
|11 | Location-motion analysis of the system with CosmosMotion module |
|12 | Velocity and acceleration analysis of the system with CosmosMotion module |
|13 | To obtain the dynamic behavior of the system under load |

Final Exam. Project delivery