



**The Hashemite University**  
**Faculty of Engineering**  
**Course Syllabus**  
**Department of Mechanical Engineering**

|                      |                            |                             |                     |
|----------------------|----------------------------|-----------------------------|---------------------|
| <b>Course Title:</b> | Computer Aided Design      | <b>Course Number:</b>       | 110402549           |
| <b>Designation:</b>  | Compulsory                 | <b>Prerequisite(s):</b>     | 110402446           |
| <b>Instructor:</b>   | Dr. Mahmoud Rababah        | <b>Instructor's e-mail:</b> | m_rababah@hu.edu.jo |
| <b>Office Hours:</b> | 11:00 – 12:00: Sun. ~ Thu. |                             |                     |

**Course Description (catalog):** Principles of computer-aided design (CAD); 3D modeling and viewing; parametric representations; elements transformations; free-form surfaces and curves; design and simulation using CAD systems.

**Textbook(s) and/or Other Supplementary Materials:**

Mastering CAD/CAM, I. Zeid, Mc Graw Hill, 2005.

**References:**

- 1- Principles of CAD/CAM/CAE systems, Kunwood Lee, Addison –Wesley, Boston-USA, 1999.
- 2- CATIA V5 workbook release 19, R. Cozzens, schroff development corp, 2009.

**Major Topics Covered:**

| Topic  | # Weeks   | # Contact hours* |
|--|-----------|------------------|
| Introduction to CAD  | 1         | 2                |
| 3D Modeling approaches   | 1         | 2                |
| Objects transformations in 3D space  | 2         | 4                |
| Viewing Algorithms   | 1         | 2                |
| Analytical and synthetic curves  | 3         | 6                |
| NURBS curves   | 1         | 2                |
| Free form surfaces   | 2         | 4                |
| Design and simulation using CAD systems (Pro/E, solid work, CATIA, NX, and etc.) | 2         | 4                |
| Projects presentations   | 2         | 4                |
| <b>Total</b>   | <b>15</b> | <b>30</b>        |

**Specific Outcomes of Instruction (Course Learning Outcomes):**

After completing the course, the student will be able to:

1. Describe mathematically the common geometric entities used in CAD systems (a)
2. Apply transformations (translation, rotation, reflection, and etc..) on 3D objects (a)
3. Design and simulate engineering assemblies using CAD systems. (c, g)
4. Investigate the main features of two or more CAD systems available in the market (i, k)

**Student Outcomes (SO) Addressed by the Course:**

| #   | Outcome Description   | Contribution |
|---|---|--------------|
| <b>General Engineering Student Outcomes</b> |   |              |
| (a)   | an ability to apply knowledge of mathematics, science, and engineering  | H            |
| (b)   | an ability to design and conduct experiments, as well as to analyze and interpret data  |              |
| (c)   | an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability | M            |
| (d)   | an ability to function on multidisciplinary teams   |              |
| (e)   | an ability to identify, formulate, and solve engineering problems   |              |
| (f)   | an understanding of professional and ethical responsibility   |              |
| (g)   | an ability to communicate effectively   | M            |
| (h)   | the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context  |              |
| (i)   | a recognition of the need for, and an ability to engage in life-long learning   | M            |
| (j)   | a knowledge of contemporary issues  |              |
| (k)   | an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.  | M            |
| H=High, M= Medium, L=Low                    |   |              |

|                      |                |           |   |
|----------------------|----------------|-----------|---|
| <b>Grading Plan:</b> | First Exam     | 20 Points | <b>Dec./3/2017 [ 15:00 ~ 16:00]</b>                               |
|                      | Second Exam    | 20 Points | <b>To be announced</b>  |
|                      | Design Project | 20 Points | [Oral presentation & Report]<br><b>Due. Dec./17/ 2017 2:00 PM</b> |
|                      | Final exam     | 40 Points | To be announced   |

**Prepared by:** Dr. Mahmoud Rababah

**Date:** 18<sup>th</sup> Jan. 2017