BME 478 – Introduction to CAD for Biomechanics

3 Credits,
3 Contact hours
Instructor: Ghaith J. Androwis, PhD
Course Coordinator: Ghaith J. Androwis, PhD, Max Roman, PhD

Textbook(s)/Materials Required:
PTC Creo Parametric 4.0 for Designers (by Sham Tickoo)

Description:
Introduction to Computer Aided Designing and analysis as applied to biomedical engineering design programs. Topics include theoretical insight into the process of design and geometrical modeling and design using industry standard CAD (Computer Aided Design) software packages. The course will also include several projects involving the application of design principles to standard problems in biomedical design.

Prerequisites:
Mech 320, BME 302

This is an elective course for the Biomechanics Track.

Course Learning Outcomes (CLO):
1. **Creating Sketches in the Sketch Mode-I& II/ Creating Base Features:** Use various tool buttons to create geometry, mirror a sketch, create fillets, and place a user-defined coordinate system. Create, dimension, and modify splines, create text, scale and rotate entities, make a copy of a sketch. Create a solid feature using the Extrude Tool.

2. **Datums, Options Aiding Construction of Parts-I&II:** Understand the three default datum planes, create the datum points, and create extrude and revolve cuts. Creating holes, rounds, chamfers, understanding ribs. Create Linear, Rotational, and Reference pattern. Use the Copy, Move, Mirror Tool options.

3. **Advanced Modeling Tools-I&II:** Create sweep feature, sweep cut, and create Parallel, Rotational, and General blend.

4. **Assembly Modeling:** Create assembly, understand packaging of components. Create the simplified representation for viewing various components of assembly. Add the offset lines to the exploded components. Use the Bill of Material in the assemblies.

5. **Generating, Editing, and Modifying the Drawing Views:** Create and retrieve the drawing sheet formats, generate different drawing views of an existing part, edit the existing drawing views and parameters associated with the views, modify the existing drawing views. Add balloons to the exploded assembly views. Create a user-defined drawing format for the drawing sheets.

Student Outcomes:

Student outcome 1 - an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Related CLO – 1,2,3,4,5

Program Specific Criteria:

K- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
Related CLO – 1,2,3,4,5

Course Topics: Sketches, Parts key features: extrude, revolve, round, shell, sweep, blend, holes, patterns, Assemblies, Drawings