Department:

Engineering Graphics and Technologies

Course Description:

This course covers advanced parametric modeling. Working with CAD software students will work in three dimensions through shape description, sketching, and multi-view projection exercises. Students will work with mechanical drawings and specifications to assemble three-dimensional digital prototypes.

Course Competencies:

Upon completion of the course, the student should be able to:

1. Create a new drawing, setup, construct geometry, and control accuracy tools.
2. Troubleshoot complex 3D geometry using wireframe, solid models and assemblies.
3. Plot drawings on media using correct drafting standards and scale.
4. Produce advanced level drawings using a variety of EG Software, CAD/Parametric modeling.
5. Produce advanced level animations and/or simulations.
6. Utilize File, and Project Management.
7. Apply other media and software applications to CAD/Parametric files.

Course Content:

A. Create
    1. Create advanced wire frame and/or solid models
    2. Create non-analytic surfaces using appropriate modeling (e.g., non-analytic: NURBS, B-spline, Gordon, Bezier, Coons)
    3. Create analytic surfaces using appropriate modeling with planes and analytic curves (e.g., conic, cylinder, evolution, rules)
    4. Create offset surfaces
    5. Find intersection of two surfaces
    6. Create joined surfaces
    7. Create a fillet or blend between two surfaces
    8. Create feature-based geometry (e.g., holes, slots, and rounds)
    9. Create cut sections
    10. Construct and label exploded assembly drawings
    11. Perform Boolean operation (e.g., union, subtraction, intersection)
B. Analyze
    1. Extract geometric data
    2. Extract attribute data
    3. Identify gaps in non-intersecting surfaces
    4. Obtain surface properties (e.g., area, perimeter, bounded volume)
    5. Obtain mass properties data (e.g., moments of inertia, centroids)
C. Software Productivity

1. Perform customization to improve productivity (e.g., customize menus, function keys, script file, macros)
2. Manipulate associated non-graphical data
3. Use template and library files to establish drawing standard presets
4. Develop geometry using parametric programs
5. Machining 3D objects
6. Produce advanced drawings
7. Produce an advanced animation in a video file

Learning Assessments:

Competencies may be evaluated by multiple measures, including exams, papers, article reviews, research, experiments, and projects.

Instructional Materials:

SolidProfessor

Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our Disability Services website.

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

A Note on Harassment, Discrimination and Sexual Misconduct

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an online report about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our Equity Grievance Policy.