Course Outline

Division: Business, Engineering and Information Technologies

Program/Dept.: Engineering Design Technology

Course Number: DSN 266  Credits: 4  Variable:

Course Title: Advanced SolidWorks and Parametric Solid Modeling

Inst. Intent: 21 Vocational Preparatory  CIP: 48.0104

Fee: CL  Type: Computer Lab Fee

Degree/Certificate Requirement: Yes
Name of Degree/Program: Certificate in Engineering Design Technology – Mechanical Specialization
Certificate Requirements: AAS in Engineering Design Technology – Mechanical Specialization

Distribution Requirement for AA/AAS: Yes

Transfer Status to 4-year Institution: No

If yes, please describe:

Course Length: Based on 11 wks/qtr.  Class Size: 25

Course Contact Hours: 44 hours  Lecture: 44  Lab:  Clinical: Other:

Prerequisite: Yes  If yes, please describe: DSN 165 or instructor permission with previous SolidWorks experience.

Required Placement Tests: No  If yes, please describe:

Comments:

Course Description:
This course is the 2nd course in a 2-course sequence for learning the SolidWorks mechanical design and modeling software. Topics include but are not limited to troubleshooting problems with parametric features, advanced data translation, sheet metal design, advanced swept and lofted shapes, generation of parametric surfaces, design table creation of part families, part & assembly configuration management, top-down assembly modeling and advanced detail drawing generation.
Course Outcomes/Learning Objectives:
By the completion of the course, the student will be able to create complex solid models, drawings and assemblies and:

1) To create 3D models and capture the designer's intent using feature-based, intelligent geometry, like bosses, cuts, holes, drafts, chamfers, fillets and shells are used.
2) To use parametric dimensions to rebuild and reshape the model accordingly.
3) To control the behavior of sketch and model geometry and assembly features by assigning dimensional and geometric properties.
4) To edit features at any time to add or delete constraints.
5) To create mathematical equations to relate dimensions to each other within a feature, within a part between features, or within an assembly between parts.
6) To edit a 3D model in part, assembly or drawing mode and have those edits reflected everywhere that the 3D model is referenced.

NSCC General Education Outcomes and/or Related Instructional Outcomes (for technical courses) Met by Course: (list each outcome):

1B To apply thinking skills
2E. To recognize and to apply the appropriate mathematical skill or process in arithmetic, algebra, and geometry required in various contexts.
4D. To critically analyze information.
5B. To select and use the appropriate software for storing, retrieving, and analyzing data for any desired subject area.

Topical Outline and/or Major Divisions:
1. Troubleshooting Parametric Features
   A. Concepts and Terminology
   B. Error messages
   C. Dangling Dimensions and Relations
   D. Parent/Child Relationships
   E. Rollback Mode
2. Data Translation
   A. Surface Models
   B. Solid Models
   C. Assemblies
   D. Drawings
3. Sheet Metal Design and Modeling
   A. As-Formed (Bent-Up) Modeling
   B. Flat-form Modeling
   C. Using Forming Palette Features
   D. Folding/Unfolding the Model
   E. Creating Sheet Metal Drawings
4. Advanced Swept and Lofted Features
   A. Creating 3D Guide Curves
   B. Sweeps with Guide Curves
   C. Lofts with Guide Curves
5. Parametric Surfaces
   A. Extruded Surfaces
B. Revolved Surfaces  
C. Swept Surfaces  
D. Lofted Surfaces  
E. Radiated Surfaces  
F. Imported Surfaces  

6. Design Tables and Configuration Management  
A. Creating Simple Part Configurations  
B. Creating Part Families  
C. Using Equations  
D. Creating Simple Assembly Configurations  
E. Creating Assembly Families  

7. Top-Down Assembly Modeling  
A. Creating In-Context Features  
B. Creating New Parts in an Assembly  
C. Creating New Sub-Assemblies in an Assembly  

8. Advanced Detail Drawing Generation  
A. Multiple Sheet Drawings  
B. Sheet Metal Drawings  
C. Tabulated Drawings  
D. Advanced Annotations for Detail and Assembly Drawings  

**Course Requirements (Expectation of Students):**  
The student is responsible for:  
1. All reading assignments.  
2. All assigned laboratory exercises.  
3. Any Mid-term exams (format to be announced).  
4. Any Final exams (format to be announced).  
5. Any other assignments that the instructor deems necessary to accomplish the objectives of the course.  
6. Demonstrate ability to perform competencies listed under course objectives.  

For the successful completion of this course, the student will need to use CAD computer facilities over and above any published lab hours as part of homework obligations.  

**Methods of Assessment/Evaluation:**  
The student will be evaluated and graded on the following:  
1. Written examinations/quizzes  
2. Evaluation of scored laboratory assignments
**Required Text(s) and/or Materials:**
Text is assigned on a quarterly basis by instructor.

**Supplemental Text(s) and/or Materials:**
See instructor.

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<th>Eric A. Beatty</th>
<th>Date:</th>
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