SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: MECH-280 Department: Mechanical Eng. Technology

Course Title: Solid Modeling for Mechanical Design I Semester: Spring Year: 2012

Objectives/Competencies

Course Objective	Competencies
1. Create fully associative assemblies from given sketches.	• Discuss top down assemblies. • Create bottom up assemblies. • Create part occurrences. • Use standard parts components. • Define the grounded part. • Explain the six degrees of freedom. • Constrain parts together using assembly constraints: Mate, Flush, Insert, and angle. • Edit assembly constraints. • Create a sub-assembly. • Check assembly interference.
2. Create 2D orthogonal drawings from solid models in accordance with ASME Y14.3 and Y14.5.	• Create a base view. • Create orthogonal views. • Create isometric and auxiliary views. • Create sectioned views. • Create a breakout view. • Place dimensions. • Create drawing annotations including geometric tolerancing. • Understand and use centerlines. • Apply the standards from ASME Y14.5-1994 to dimensions for both English and Metric drawings.

	• Create balloons and parts lists for assembly drawings. • Plot drawings using line weights.
3. Analyze proposed products for design and manufacturing feasibility.	• Prepare a critical design review • Document design issues and propose solutions. • Perform design review presentation to "management".
4. Understand and apply fundamental mechanical design principles.	• Perform design calculations. • Discuss and use tolerances and allowances. • Apply design fits and tolerances—running, clearance location, and force. • Apply geometric tolerancing for part functionality. • Develop a working knowledge of engineering materials. • Use Machinery's Handbook to look up and create standard components.
5. Understand the basics of Geometric Dimensioning and Tolerancing.	• Calculate position tolerances using the Fixed Fastener Formula. • Discuss components of the Feature Control frame. • Select and identify Datums • Place Basic dimensions. • Discuss and use projected tolerance zones.
6. Create a design using reverse engineering methods.	• Measure and create component parts. • Create a table of fits. • Discuss and create sub-assemblies. • Create weldments. • Discuss and create gearing systems.