

MOHAWK VALLEY COMMUNITY COLLEGE
UTICA AND ROME, NEW YORK

CENTER FOR SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

COURSE OUTLINE

INTRODUCTION TO SOLID MODELING

MT 155

REVISED BY J. BIRT: ADDED ABET REFERENCES; ADDED REVISION TABLE 3/2015

REVISED BY B. FULLER: EDITED FORMAT 4/2015

REVISED BY J. BIRT: ADDED MEMORY DRIVE REQUIREMENTS, MADE "SKILL" PLURAL 8/2016

REVISED BY J. BIRT: MODIFIED FOOTER; MOVED REVISION TABLE TO NEW COVER PAGE 4/2017

REVISED BY J. BIRT: MODIFIED FOOTER; DELETED OLD REVISION TABLE 8/2017

REVISED BY J. BIRT: MODIFIED FOOTER; UPDATED "REQUIRED MATERIALS" LIST 7/2018

REVISED BY J. BIRT: MODIFIED FOOTER; UPDATED "MATERIALS" LIST TO INCLUDE

LAPTOP/TABLET, ADDED "using formulas" TO OUTCOMES 8/2019

REVISED BY J. BIRT: MODIFIED FOOTER; UPDATED "MATERIALS" LIST TO REMOVE MEMORY DRIVE
AND "SUGGESTED MATERIALS", INCLUDE SW-CAPABLE COMPUTER AND AUDIO-VIDEO
CAPABILITIES 8/2020

REVISED BY J. BIRT: MODIFIED FOOTER; REMOVED "asynchronous learning" NOTE, FIXED TYPOS,
UPDATED ETC-ABET REFERENCES 8/2021

I. Catalog Description

MT155 Introduction to Solid Modeling

C 1, P 4, CR 3

This course is an introduction into the use of three-dimensional solid modeling CAD software. Topics include creating models using features such as protrusions, cuts, rounds, blends, revolutions, and sweeps. Model planning and design intent are stressed. Assemblies, drawings, documentation, and detailing are also covered, as well as output and interfaces with common software such as spreadsheets and word processing.

II. Student Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Create sketched cross-sections using parametric construction techniques. (3)
2. Use software in the creation of basic solid modeling features, including protrusions, cuts, rounds, blends, revolving, and sweeps. (3)
3. Plan a solid model to capture desired design intent and utilize parametric capabilities. (2)
4. Create parametric assemblies from the models. (3)
5. Create drawings and other documentation based on solid models and assemblies and present and describe this information. (3)
6. Create and integrate spreadsheet techniques into solid modeling capabilities using formulas. (1)

∅ – References ETAC of ABET Program Outcome

III. Major Course Topics

Introduction

Uses of CAD and spreadsheets
Geometry, computer skills review
3D critical thinking
Basic computer skills

CAD sketching

Geometric figures: line, rectangle, circle, arc, radius, point, centerline
Relations: horizontal, vertical, symmetric, collinear, coincident, tangent, equal
Dimensioning: horizontal, vertical, oblique, angle, radius, diameter
Exact position: use of the origin, underdefined, overdefined
Trim, convert

Features

Extrusion, rotation, cut, hole
Fillet, chamfer
Mirror, pattern, shell
Sweep, helix, loft
Datum point, line, axis, plane

Assembly

Insert
Mate
Subassemblies
Pattern Assembly
Motion

Drawings

Drawing generation
Parametric capabilities
Detailing

Spreadsheets

Uses
Formulas
Formatting
CAD design tables

IV. Materials

Required:

- 6" calipers, accurate to 0.001"
- Internet-connected Win7 / Win 8 / Win 10 computer, capable of running the SolidWorks software
- Internet audio, video, and web communication capabilities