



COURSE OUTLINE

DIVISION: Workforce Development

COURSE: CAD 2201 Computer Aided Design II

Date: Fall 2017

Credit Hours: 3

Prerequisite(s): CAD 2200

Delivery Method: **Lecture** **2 Contact Hours (1 contact = 1 credit hour)**
 Seminar **0 Contact Hours (1 contact = 1 credit hour)**
 Lab **2 Contact Hours (2-3 contact = 1 credit hour)**
 Clinical **0 Contact Hours (3 contact = 1 credit hour)**
 Online
 Blended

Offered: **Fall** **Spring** **Summer**

IAI Equivalent –**Only for Transfer Courses**-go to <http://www.itransfer.org>:

CATALOG DESCRIPTION:

In this advanced competency-based course students will be prepared for careers in engineering technology. This course is a continuation of Computer Aided Design I and includes computer graphic principles as they relate to the concepts of CAD Solid Modeling. Students will gain advanced skills in drafting layout, CAD editing techniques, dimensioning and visual presentation. Students will learn how to create virtual 3-D models and how to render them with color, light and shadows. These principles will be applied to the latest educational version of SolidWorks. Principles will include advanced modeling parts and assemblies and creation of working drawings. Students will use the design process to develop models to prototyping a product. Students will prepare models to be printed on a 3D and prepare production drawing for this product. Students will be able to take the SolidWorks Certified Associates exam at the end of this course. Students passing the exam will be issued a certificate of passing. Students will be able to utilize and reinforce their intermediate workplace skills, including teamwork, communication and math skills.

GENERAL EDUCATION GOALS ADDRESSED

[See last page for Course Competency/Assessment Methods Matrix.]

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

[Choose up to three goals that will be formally assessed in this course.]

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciate diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals. See last page for more information.]

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

1. Apply CAD Solid Modeling concepts to engineering design
2. Prepare 3D models
 - a. Model advanced solid parts and assemblies
 - b. Produce advanced working drawings from parts and assemblies.
 - c. Prepare advanced modeling types such as sheet metal parts, weldment
3. Qualify to take SolidWorks Certified Associates exam
 - a. Read and understand an engineering document
 - b. Build a part from a detailed dimensioned illustration
 - c. Assign materials to parts
 - d. Calculate the volume using IPS unit system
 - e. Locate the center of mass
4. Reinforce knowledge of the design process
 - a. Prototype design using 3D printing
 - b. Create production ready drawing according to industry standards

MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

[For each of the goals selected above, indicate which outcomes align with the goal.]

Goals	Outcomes
First Goal	
To apply analytical and problem solving skills to personal, social, and professional issues and situations.	Qualify to take SolidWorks Certified Associates exam Reinforce knowledge of the design process
Second Goal	
To understand and use technology effectively and to understand its impact on the individual and society.	Apply CAD Solid Modeling concepts to engineering design Prepare 3D models

COURSE TOPICS AND CONTENT REQUIREMENTS:

Advanced Modeling Topics

1. Introduction to 3D Sketch
2. Plane Creation
3. Sweep with Composite Curves
4. Advanced Modeling with Sweep & Loft
5. Loft with Guide Curves and advanced Sweep
6. Using Surfaces – Advanced Modeling and Lofted Surface Advanced
7. Using the Deform Feature
8. Sweep with Solid Body
9. Surfaces vs. Solid Modeling
10. Using PhotoView 360
11. SimulationXpress

Sheet Metal Topics

1. Sheet Metal Parts
2. Sheet Metal Forming Tools – Button with Slots
3. Sheet Metal Conversions and flat patterns
4. Working with Sheet Metal STEP Files
5. Weldments

Top-Down Assembly Topics

1. Top-Down Assembly
2. Bottom-Up Assembly
3. External References & Repair Errors

Production Drawings

1. Section Views

2. Auxiliary Views
3. Alternate Position Views
4. Broken-out Section
5. BOM Table creation and modification

3D Printing

1. Create .STL files for use in 3D printing software

INSTRUCTIONAL METHODS:

Lecture

Lab

Group Projects

INSTRUCTIONAL MATERIALS:

SolidWorks Online Curriculum

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

Completion of assigned problems, required reading of text.

Periodic tests

Group Projects

Problem Based Learning

Oral Presentation

A= 90-100

B= 80-89

C= 70-79

D= 60-69

F= 0-59

OTHER REFERENCES

Solid Professor

Course Competency/Assessment Methods Matrix

(Dept/# Course Name)	Assessment Options																																				
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment					
	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D											
1. Reinforce their knowledge of CAD and Solid Modeling concepts			X	X	X	X		X	X		X																									X	X
2. Model advanced solid parts and assemblies			X	X	X	X		X	X		X																									X	X
3. Produce advanced working drawings from parts and assemblies.			X	X	X	X		X	X		X																							X	X	X	X
4. Prepare advanced modeling types such as sheet metal parts, weldments			X	X	X	X		X	X		X																							X	X	X	X
5. Analyze parts and assemblies using add in programs and other SolidWorks tools			X	X	X	X		X	X		X																						X	X	X	X	
6. Reinforce their knowledge of the design process			X	X	X	X		X	X		X																					X	X	X	X	X	

7. Prototype their design using 3D printing			x	x	x	x		x	x	x												x			x	x
8. Create industry drawing according to drafting standards			x	x	x	x		x	x	x												x		x	x	x