



COURSE OUTLINE

DIVISION: Workforce Development

COURSE: CAD 2200 Computer Aided Design I

Date: Fall 2017

Credit Hours: 3

Prerequisite(s): NONE

Delivery Method:

<input checked="" type="checkbox"/> Lecture	2 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input checked="" type="checkbox"/> Lab	2 Contact Hours (2-3 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input type="checkbox"/> Online	
<input type="checkbox"/> Blended	

Offered: Fall Spring Summer

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

CATALOG DESCRIPTION:

This course is intended to prepare the student for the role of engineering design as it relates to Computer Aided Drafting/Design. This course will teach the student to implement the use of the 3D solid modeling CAD package SolidWorks. Students will learn the key skills and knowledge required to design models starting with 2D sketching, solid part modeling, assembly creation, and drawing production. Emphasis will be given to design intent. The student will use the design process to plan and develop a design for manufacture. The student will prepare models of this design to be prototyped by 3D printing. Production drawings of this design will be plotted and checked.

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:

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

1. Demonstrate understanding of the role of a CAD designer in engineering.
 - a. The role of Computer Aided Design tools
 - b. Use of the concepts of the Design Process
 - c. Become part of a team that will develop a product for real life production (product will become part of a capstone course Making Industry Meaningful in College to be produced in CAD 2208 Design Projects)
2. Construct computer models using a variety of 3D construction techniques
 - a. Create 3D modeled parts
 - b. Create assembly models from 3D parts
 - c. Create two-dimensional views from a three-dimensional model for detail drafting
3. Operate a 3D printer to produce prototype
 - a. Decide what type of 3D printer would best apply to the design
 - b. Calculate cost and best practice
 - c. Print the design
4. Plot and check the drawings
 - a. Create orthographic view of detail components
 - b. Create assembly drawings complete with bill of materials and annotations.
5. Test design
 - a. Analyze product for participation in capstone class
 - b. Share results with team, members of the class and faculty
6. Communicate results of design project

- a. Technical writing
- b. Pictorial rendering of product
- C. Design presentation (oral report)

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.	Demonstrate understanding of the role of a CAD designer in engineering.
Second Goal	
To communicate successfully, both orally and in writing, to a variety of audiences.	Communicate results of design project.
Third Goal	
To understand and use technology effectively and to understand its impact on the individual and society.	Construct computer models using a variety of 3D construction techniques.

COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Solid modeling and engineering applications
2. Introduction basic modeling techniques.
3. Create 2D sketches using coordinate systems for 3D object constructions.
4. Creating and changing 2D coordinate planes.
5. Using Dimensions and sketch relations
6. Creating solid model extrusions, revolved solids, lofted solids, sweeps, filleting and chamfering solid objects, and constructing solid details and features.
7. Controlling solid model display, viewing 3D model internal features, creating and using Multiview layouts, and solid model analysis.
8. Create parametric equations
9. Create reference geometry
10. Generate 2D layouts for ANSI standard details and assemblies

11. Create part files for 3D printing
12. Use 3D printers to produce prototypes
13. Use the design process to create a product
 - a. Analyze existing products (MIMIC – Making Industry Meaningful In College)
 - b. Brainstorm ideas (new or existing)
 - c. Sketch ideas for products
 - d. Model products on SolidWorks
 - e. 3D print prototypes
 - f. Make production drawing for products
 1. Detail drawing – dimension and tolerance according to industry standards
 2. Make sub-assembly and assembly drawing
 3. Notes and general notes
 4. Bill of materials and part numbering systems developed
 - g. Check production drawings
 - h. Finalize designs

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

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						
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.																																
1 Demonstrate understanding of the role of a CAD designer in engineering.				X				X	X																			X			X	X
2. Construct computer models using a variety of 3D construction techniques.				X				X	X		X																	X			X	X
3. Operate a 3D printer to produce prototype.				X				X	X		X																	X			X	X
4. Plot and check the drawings.				X				X	X		X																	X			X	X
5. Test design		X	X	X	X			X	X		X																X			X	X	X
6. Communicate results of design project.		X	X		X	X		X		X																	X		X	X	X	X