

ILLINOIS VALLEY COMMUNITY COLLEGE



COURSE OUTLINE

DIVISION: Workforce Development

COURSE: CAD 2208; Design Projects

Date: 2012

Credit Hours: 4

Prerequisite(s): CAD 1200, CAD 2200

Delivery Method: **Lecture** **2 Contact Hours** (1 contact = 1 credit hour)
 Seminar **0 Contact Hours** (1 contact = 1 credit hour)
 Lab **4 Contact Hours** (2 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:

This course will give the student the opportunity to apply the knowledge and training achieved in preceding courses in an "on-the-job" situation. Assignments will consist of analysis of problems, synthesis, preliminary design, layout, and production of the final set of working drawings. Students in this class will participate in the award winning MIMIC (Making Industry Meaningful In College) program. Students from CAD, Electronics, Marketing, Accounting and Manufacturing will be teamed together in "companies" to design, market and sell a product on campus

GENERAL EDUCATION GOALS ADDRESSED

[See the last page of this form for more information.]

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

[Choose those goals that apply to this course.]

- To apply analytical and problem solving skills to personal, social and professional issues and situations.
- To communicate orally and in writing, socially and interpersonally.
- To develop an awareness of the contributions made to civilization by the diverse cultures of the world.
- To understand and use contemporary technology effectively and to understand its impact on the individual and society.
- To work and study effectively both individually and in collaboration with others.
- To understand what it means to act ethically and responsibly as an individual in one's career and as a member of society.
- To develop and maintain a healthy lifestyle physically, mentally, and spiritually.
- To appreciate the ongoing values of learning, self-improvement, and career planning.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals.]

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

1. Differentiate between the various aspects (identification, preliminary ideas, refinement, analysis, decision and implementation) of the total design process.
2. Gather design data through the use of manufacturer's catalogs, company standards and specifications, technical papers and magazines and engineering consultants.
3. Evaluate the economy of a design by considering material selection, manufacturing processes, uses of standard parts, etc.
4. Design a product complying with engineering specifications, which will include design sketches, preliminary layouts, details, and assembly drawings with the use of CAD programs such as AutoCAD or Personal Designer.
5. Present a written and an oral report defending his solution to the given problem.
6. Be able to incorporate essential workplace skills into their course work and lives
7. Students will be taught principles of Continuous Quality Improvement
8. NSF Grant 0501885 Embedding CQI Technology In Two Year College Technical Curricula places a high value on teamwork, leadership, collaboration, communication, and leadership. Our goal is to continually improve the teaching-learning process.
9. Students will practice the design process by examining, evaluating and reengineering previous design projects from the award winning MIMC (Making Industry Meaningful in College) program.

COURSE TOPICS AND CONTENT REQUIREMENTS:

- I. Design Process
 - A. Design situation
 - B. Dealing with situation
 - C. Identify the elements
 - D. Analyze the elements
 - E. Creating designs
 - F. Evaluating designs
 - G. Selected design
 - 1. Rework
 - 2. Develop
 - H. Communicate design
- II. Design Considerations
 - A. Specifications
 - B. Environment
 - C. Safety
 - D. Reliability
 - E. Standardization and interchangeability
 - F. Manufacture and assembly
 - G. Cost
 - H. Appearance
 - I. Maintenance
- III. Data Gathering
 - A. Review of similar components and products
 - B. Survey of manufacturers' catalogues and reference material
 - C. Company standards and specifications
 - D. Professional magazines
 - 1. Technical papers
 - E. Engineering consultants
 - F. "Brainstorming" design creations
- IV. Economy of Design
 - A. Material selection
 - 1. Cost per lb.
 - 2. Weight
 - 3. Strength
 - 4. Application
 - B. Manufacturing process
 - C. Use of standard parts
 - 1. Interchangeability
 - D. Design simplification
 - E. Finishes and tolerances
- V. Human Considerations in Design
 - A. Resistance to change
 - B. Involvement of key personnel
 - C. Operator acceptance
 - D. Serviceability and maintenance
 - E. Safety
- VI. Design Practice
 - A. Initial design sketches

- B. Preliminary layout
- C. Assembly drawings
- VII. Reports
 - A. Oral
 - B. Written
- VIII. Advanced Essential Workplace Skills
 1. Able to read, create and interpret technical reports and manuals
 2. Able to use effective oral communication skill with small group interaction
 3. Able to understand and apply basic math skills appropriate to coursework
 4. Able to understand and apply appropriate written communication skills appropriate to coursework
 5. Able to use effective oral communication skill by presenting an oral technical report
 6. Student can define a drug free and alcohol free work environment
 7. Able to correlate studies of course related materials using reasoning and logic
 8. Able to use problem solving skill to complete project based assignments
 9. Able to apply life application skills relating to coursework and job seeking
 10. Able to identify core values and how to apply them
 11. Able to apply technical skills to course related projects and activities
 12. Able to apply teamwork skills while participating in small and large group activities
 13. Able to apply life application skills relating to coursework and job seeking
 14. Able to identify core values and how to apply them
 15. Understand validity of goal setting
 16. Use goal setting skills in project based activities
 17. Learn and appropriate self management skills; promptness, time management, hygiene, self control
 18. Able to use mental processes of discernment analyze and evaluate all process in order to form a judgment to make a recommendation
 19. Learn to recognize and develop personal leadership qualities
 20. Understand validity of teamwork skills in large and small group settings
 21. Able to be challenged to hear, understand and reinterpret communication from
 22. Students will be exposed to opportunities to build self worth and confidence
 23. Able to identify learning styles and how to apply them
 24. Understand and explain several methods of decision

INSTRUCTIONAL METHODS:

1. Students in this class will be participating in the MIMIC project (Making Industry Meaningful In College).
2. When necessary various audio-visual equipment will be used.
3. As often as possible, industrial drawings will be used.
4. Field trips will be made to various engineering departments.
5. When possible, guest lecturers will be used.
6. Group Projects

INSTRUCTIONAL MATERIALS:

none

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

Group Projects

Problem Based Learning

OTHER REFERENCES

1. Manufacturing catalogs.
2. Various technical papers and magazines.
3. Machinery's Handbook

Course Competency/Assessment Methods Matrix

CAD 2208; Design Projects		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. Differentiate between the various aspects (identification, preliminary ideas, refinement, analysis, decision and implementation) of the total design process.			X								X		X	X				X														X	X
2. Gather design data through the use of manufacturer's catalogs, company standards and specifications, technical papers and magazines and engineering consultants.			X									X						X	X												X	X	
3. Evaluate the economy of a design by considering material selection, manufacturing processes, uses of standard parts, etc.			X								X		X	X				X												X	X		X
4. Design a product complying with engineering specifications, which will include design sketches, preliminary layouts, details, and assembly drawings with the use of CAD programs such as AutoCAD or Personal Designer.			X								X		X	X				X												X	X		X

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Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D							
5. Present a written and an oral report defending his solution to the given problem.			X							X			X	X				X										X	X		X	X
6. Be able to incorporate essential workplace skills into their course work and lives			X							X			X	X				X										X	X		X	X
7. Students will be taught principles of Continuous Quality Improvement			X							X			X	X				X									X	X		X	X	
8. NSF Grant 0501885 Embedding CQI Technology In Two Year College Technical Curricula places a high value on teamwork, leadership, collaboration, communication, and leadership. Our goal is to continually improve the teaching-learning process.			X							X			X	X				X									X	X		X	X	
9. Students will practice the design process by examining, evaluating and reengineering previous design projects from the award winning MIMC (Making Industry Meaningful in College) program		X								X		X	X	X				X								X	X		X	X		