

**Introduction to Engineering Design (IED)
2 Term Class (160313/160314) (EGT-400)**

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|--------------------|--------------------|----------------------|---------------------|
| Instructor | | Course No. | |
| Section # | | Credit Hours | 1 |
| E-mail | | Work Phone | |
| Work Period | See instructor. | Work Area | Before/After School |
| Class Days | Daily | Class Length | 90 minutes |
| Room | See class schedule | Prerequisites | Algebra |

Text, Course Pack, and Additional Materials

IED Copyrighted Curriculum – Digital Format - .chm file

Madsen, et al. Engineering Drawing and Design. 3rd ed. Albany: Delmar, 2004.

***Required Materials**

1. *Pen Drive*
2. Three ring binder and dividers for student portfolios.
3. Pencils, blue or black pens, and erasers
4. Notebook for this class
5. Calculator recommended (TI-30)

Course Information

Students use a problem-solving model to improve existing products and invent new ones. They learn how to apply this model to solve problems in and out of the classroom. Using sophisticated three-dimensional modeling software, students communicate the details of the products. Emphasis is placed on analyzing potential solutions and communicating ideas to others. This is a dual credit / college course where students may have the opportunity to receive 3 credit hours at the University of Iowa, Iowa State University, or Eastern Iowa Community College District (Scott Community College).

1. Introduction to Engineering Design (IED) is a 2 consecutive term, elective class, and is the first in the Project Lead the Way pre-engineering sequence.
2. IED is 1 credit with the pre-requisite of Algebra. Please see the instructor if you have not taken Algebra.
3. PLTW's curriculum makes math and science relevant for students. By engaging in hands-on, real-world projects, students understand how the skills they are learning in the classroom can be applied in everyday life. This approach is called activities-based learning, project-based learning, and problem-based learning or APPB-learning.

**Course Goals
Standards**

- *Students will be able to:*
 1. Demonstrate the ability to use three-dimensional modeling software.

2. Demonstrate the use of problem-solving model to improve existing products and invent new ones in and outside the classroom.
3. Experience the creative thinking process through the use of vertical and lateral thinking; identifying, categorizing, and selecting a solution to a problem; and communicating that solution in written and verbal formats.

Benchmarks

- *Students will be able to:*
 1. Discuss the history of engineering and engineering technology design.
 2. Utilize sketching and visualization techniques.
 3. Communicate conceptual ideas through written and verbal formats.
 4. Practice effective communication and teamwork techniques.
 5. Apply the steps of the design process to solve a variety of design problems.
 6. Translate a three-dimensional drawing or model into corresponding orthographic drawing views.
 7. Construct various geometric forms and shapes.
 8. Explore and demonstrate assembly modeling skills to solve a variety of design problems.
 9. Demonstrate a working knowledge of products cost analysis.
 10. Develop a portfolio to organize and display evidence of work.

Attendance/Tardy Students

Attendance:

- Few, if any students, can develop sufficient engineering design skills without the benefit of a class experience. Class will be a very difficult if you try to go it alone! You must attend class. Attendance will be taken at the beginning of each class.
- If you are absent, it is your responsibility to obtain class notes/assignments from another person and be prepared with assignments for the next class meeting.

Grading (Evaluation)

Grades will be determined by a combination of the following assessments with a strong emphasis on the highlighted methods: Academic prompts, Checklists, Computerized assessment, Concept mapping, Demonstrations / Presentations, Informal observations/discussions/conferences, Other evidence, Student self-reflection/assessment, Performance assessment, Paper and pencil tests, Performance tasks, Portfolios, Project/Product(s), Individual and group work, Rubric, and Tests and/or Quizzes.

Possible Grading Scale Weights (This is subject to change upon teacher discretion)

- * 50% Projects / Presentations
- * 25% Quizzes and/or Tests
- * 12.5% Activities / Daily Assignments
- * 12.5% Communication / Teamwork / Participation / Other

| | | |
|----------------------|--------------|---|
| A | 93 and above | Firm command of knowledge domain |
| A⁻ | 90 - 92 | High level of skill development Exceptional preparation for later learning |
| B⁺ | 87 - 89 | Command of knowledge beyond the basic concepts of knowledge |
| B | 83 - 86 | Advanced development of most skills Has prerequisites for later learning |
| B⁻ | 80 - 82 | |
| C⁺ | 77 - 79 | Command of the basic concepts of knowledge |
| C | 73 - 76 | Demonstrates ability to use basic skills Lacks a few prerequisites for later learning |
| C⁻ | 70 - 72 | |
| D⁺ | 67 - 69 | Lacks knowledge of some fundamental ideas |
| D | 63 - 66 | Some important skills not attained Deficient in many of the prerequisites for later learning |
| D⁻ | 60 - 62 | |
| F | 59 and below | Most of the basic concepts and principles not learned Most essential skills have not been demonstrated Lacks most prerequisites needed for later learning |

- (4) **Enrichment/Extra Credit:** There will be a few announced opportunities for extra credit. These generally occur while going over homework or from class discussions; they are random in nature and at the discretion of the instructor.

Make-Up Policy (also see “Tardy” under the Attendance section, Success In This Class):

- Quizzes—Students will be allowed 2 days to make up work for every 1 day missed according to school board policy.
- Team Work/In-Class Work. There will be some points earned in team projects and class participation but these vary significantly from class to class.
- Exams— Students will be allowed 2 days to make up work for every 1 day missed according to school board policy. Example: Miss class on a Tuesday. where an exam was given, the exam must be made up by Friday of the current week. (Days the school is closed do not count as “school days.”
- Late Assignment Policy: See assignment rubric.

Instructor Expectations

- Respect for fellow class members (and their individuality), the instructor and yourself. Translation, I will treat you with respect, and I expect the same. Class will be conducted in a manner that reflects: punctual attendance, prior preparation, and the procedure of turning off **cell phones/pagers** and other similar devices.
- Unethical Behavior: Academic dishonesty (cheating) will not be tolerated and may result in course failure (see student handbook).
- Teacher’s role: to help you be successful in this class, but **your success in this class will hinge largely on self-discipline and the quality & quantity of effort you apply.**
- Student Handbook & Student Conduct. The handbook clearly defines the district’s expectation of student behavior, consequences, and due process. Although my expectations are stated above, the district’s rules will come to bear when they are applicable and must, therefore, be considered a part of this syllabus.

Instructional Procedures & Support

1. Instructional procedures will consist of lecture, demonstration, reference materials, and exemplars.

2. Extra help will be provided before and after school upon request.
3. Teachers will facilitate the APPB (Activities, Projects, Problems) Learning Model.

Activities are a method of instruction that involves directed teaching of a particular process or procedure. Activities engage students in learning skills that are later applied in more complex situations. Activities lead students to higher levels of learning.

Project-based learning is a comprehensive approach to instruction that presents a project or relevant activity that enables students to synthesize knowledge and to individually resolve problems in a curricular context.

Problem-based learning is both a curriculum organizer and an instructional strategy that presents a problem, which is relevant and related to the context where students are the stakeholders. Students synthesize and construct knowledge to help them actively grapple with the complexities of the problem and develop strategies to direct their own learning. When students experience a problem in context, they are more likely to make connections and thus see the value in what they are learning

Academic Accommodation

Anyone who needs an academic accommodation based on a documented disability should inform the teacher.

Scott Community College Information

To Access E-Bridge: Grades and Class Schedule Visit: <http://www.eicc.edu>

- Click on the e-bridge link.
- Click on Students link.
- Choose Log-In.
- Enter your Student ID and password

Your user name is the first letter of your first name and your complete last name, lower case. Your initial password is set as the last 6 digits of you SSN or your birth date--MMDDYY. (You may be prompted to change your password during your first visit to e-bridge. Your password must be 6-9 characters and contain both letters and numbers. You are responsible for remembering your password.)

Be sure to logout after you complete your transactions. If you have questions contact 563-441-4181 (Student Services).

Late Assignment Rubric:

| FULL CREDIT (100%) | LATE CREDIT (90%) | PARTIAL CREDIT (80%) | NO CREDIT (0%) |
|------------------------------|--|---|--|
| On time and fully completed. | One day late and fully completed (or) On time but not fully completed. | Two days late and fully completed (or) On time but only partially complete. | Three days late (or) One to two days late and not fully completed (or) On time but less than ½ work completed. |

Major Topics Covered (See Topical Outline)