

COURSE OUTLINE

ENGINEERING 111
Basic Solid Works

I. Catalog Statement

Engineering 111 is a basic course in engineering, drafting and design utilizing Solid Works software, with an emphasis on three-dimensional design, modeling, and engineering applications.

Units: 3.0

Lecture Hours: 2.0

Lab Hours: 4.0

(Faculty Laboratory Hours - 4.0 + Student Laboratory Hours - 0.0 = 4.0 Total Laboratory Hours)

Prerequisite: Engineering 101 or equivalent.

Recommended Preparation: Eligibility for English 120 or ESL 151.

II. Course Entry Expectations

Skill Level Ranges: Reading 5; Writing 5; Listening/Speaking 5; Math 3.

Prior to enrolling in the course, the student should be able to:

1. complete a series of basic drafting assignments utilizing lecture and text information;
2. demonstrate their knowledge of basic drafting and dimensioning through a series of drawing assignments;
3. gain a basic knowledge of industrial drafting practices through tests and lecture information.

III. Course Exit Standards

Upon successful completion of required coursework the student will be able to:

1. complete a series of problems demonstrating basic knowledge and skills in utilizing a computer aided drafting system;
2. acquire a basic knowledge of computer aided manufacturing by completion of a series of engineering documents;
3. utilize the computer system to complete a series of basic design problems;
4. exhibit a working knowledge of the operating system commands through the completion of a comprehensive mechanical design problem.

IV. Course Content

Total Contact Hours: 96

A. Introduction	Lecture 2 hours
1. Constraint-based solids modeling	Laboratory 2 hours
2. Solids modeling	
B. Solid Works Basics	Lecture 2 hours
1. Options Settings	Laboratory 6 hours
2. Starting a drawing	
3. Creating a new part	
4. Modeling a part	
C. Geometric Construction	Lecture 4 hours
1. Lines, circles, and points	Laboratory 8 hours
2. Line types	
3. Fillets and rounds	
4. Chamfers	
5. Rotations	
6. Mirroring	
7. Creation of Splines	
D. Dimensioning	Lecture 2 hours
1. Dimensioning a sketch	Laboratory 8 hours
2. Changing dimensions	
3. Dimensional placement	
4. Sections	
E. Modeling a Part	Lecture 2 hours
1. Part sketching	Laboratory 8 hours
2. Modifying a sketch	
3. Extruding a sketch	
F. Modeling an Assembly	Lecture 2 hours
1. Creating an assembly document	Laboratory 8 hours
2. Modifying an assembly document	
3. Insertion of sub-assemblies	
4. Creating exploded views	
G. Working Drawings	Lecture 2 hours
1. Creating working drawings	Laboratory 8 hours
2. Option settings	
3. Modifying formats, geometry and text	

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| H. Modification of Drawings | Lecture 2 hours |
| 1. Component interface checking | Laboratory 8 hours |
| 2. Customizing procedures | |
| 3. Modifying colors and text fonts | |
| 4. Modifying configuration dimensions | |
| I. Mass Properties Dialog Box | Lecture 2 hours |
| 1. Use and modification of dialog boxes | Laboratory 8 hours |
| J. Final Design Project | Laboratory 12 hours |
| 1. Team formation | |
| 2. Project selection/proposal and teacher feedback | |
| 3. Generation of models, assemblies, and engineering drawings | |
| 4. Project presentation (oral and written report) | |

V. Methods of Instruction

The following instructional methodologies may be used in the course:

1. lecture/discussion;
2. demonstrations;
3. films;
4. peer learning;
5. guest speakers.

VI. Out of Class Assignments

The following out of class assignments may be used in the course:

1. written examination at the end of each module;
2. final group design project.

VII. Methods of Evaluation

The following methods of evaluation may be used in the course:

1. written and manipulative final examination.

VIII. Textbooks

Planchard, D. Engineering Design with Solid Works.

Mission, KS: Schroff Development Corporation, 2011.
10th Grade Reading Level. ISBN-13: 9781585036233

IX. Student Learning Outcomes:

1. Student will know the steps to creating a solid model and demonstrate the process in the final group project.
2. Student will demonstrate all aspects of sketching including geometrics, types of lines, dimensions, and modifications.
3. Student will convert sketch into a working drawing, configure, and assemble the solid model.