ENGR 1121  Engineering Design and Principles 1

Common Course Outline

Course Information

Description  This course is an introduction to personal digital fabrication using the fabrication laboratory. In this project based learning environment, students will fabricate and test their design projects. It also introduces the concept of artifact dissection as it relates to understanding engineering concepts and continuous improvements. This course will cover standard ABET professional outcome c. Prerequisite: MATH 125 or MATH 130.

Instructional Level  Associate Degree

Total Credits  2.00

Total Hours  64.00

Types of Instruction

Instruction Type  Credits/Hours
Lab  2

Pre/Corequisites

MATH 125 or MATH 130

Institutional Core Competencies

1 Analysis and inquiry: Students will demonstrate an ability to analyze information from multiple sources and to raise pertinent questions regarding that information.
2 Critical and creative thinking: Students will develop the disposition and skills to strategize, gather, organize, create, refine, analyze, and evaluate the credibility of relevant information and ideas.
3 Teamwork and problem-solving: Students will demonstrate the ability to work together cohesively with diverse groups of persons, including working as a group to resolve any issues that arise.

Course Competencies

1 Describe the history and concepts of the Fab Lab.

Learning Objectives
Summarize the Massachusetts Institute of Technology (MIT) Center for Bits and Atoms Fab Lab history.
Describe the results of a fab lab installation.

List typical equipment in a fab lab.

Describe the advantages of digital fabrication.

2 **Indicate basic knowledge of shop safety procedures.**

Learning Objectives
Demonstrate basic knowledge about safety through appropriate and safe fab lab conduct.

Summarize equipment safety protocols.

Relate introductory knowledge about blood borne pathogens.

3 **Demonstrate introductory level of use of Fabrication Laboratory equipment.**

Learning Objectives
Demonstrate basic knowledge of the vinyl cutter.

Demonstrate basic knowledge of the 3D printer.

Demonstrate basic knowledge of various shop tools.

Demonstrate basic knowledge of the laser cutter.

Show basic ability to maintain and troubleshoot Fab Lab equipment.

4 **Utilize software for project creation.**

Learning Objectives
Select appropriate software for equipment.

Demonstrate basic ability to use software for equipment.

Operate software to achieve the goal of the project.

5 **Perform artifact dissection.**

Learning Objectives
Disassemble a simple machine.

Analyze the components and operation of the machine.

Relate findings and information to instructor and classmates.

6 **Create projects utilizing fab lab equipment.**

Learning Objectives
Develop a basic design strategy.

Create and assemble necessary components needed for the project.

Test the project and improve upon it as needed.

Present and demonstrate the project.

**SCC Accessibility Statement**

If you have a disability and need accommodations to participate in the course activities, please contact your instructor as soon as possible. This information will be made available in an alternative format, such as Braille,
large print, or cassette tape, upon request. If you wish to contact the college ADA Coordinator, call that office at 507-389-7222.

Disabilities page http://southcentral.edu/academic-policies/disability-rights.html