

STATUS: A

COMMON COURSE NUMBER: ARC 2681

COURSE TITLE: Environmental Technologies

CREDIT HOURS: 3

CONTACT HOURS BREAKDOWN:

Lecture/Discussion 48

Lab 16

Other 00

Contact Hours/Week 4

CATALOG COURSE DESCRIPTION:

Prerequisite: ARC 2461

Corequisite: None

The student will demonstrate a proficiency in the basic principles of comfort, safety, and efficiency theories and concepts in relationship with the environment according to accepted professional standards with a high degree of accuracy.

General Education Requirements - Associate of Arts Degree, meets Area(s):

General Education Requirements - Associate in Science Degree, meets Area(s):

UNIT TITLES:

1. Energy, Perception and Comfort
2. Environmental vs. HAVC Systems
3. Light, Sound, and Acoustics
4. Sanitation and Plumbing Fundamentals
5. Electrical Systems and Components
6. Fire Safety, Vertical Transportation, and Technological Strategies

I. Course Overview:

Upon successful completion of this course, the students should be able to identify, understand and determine appropriately utilizations of basic building components and systems response to environmental and functional conditions.

II. Units:

Unit 1. Energy, Perception and Comfort

General Outcome:

- 1.0 The students should be able to understand the influence of types of energy sources of the past, present, and future on architectural building systems.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 1.1 Understand energy usage patterns in the United States and its relationship to the world.
- 1.2 Understand the relationship between buildings and human senses.
- 1.3 To know and use the definitions of psychometrics as it relates to our perception of thermocomfort and human metabolism.
- 1.4 Understand and use the various charts and graphs that relate variables of our sensory environment.

Unit 2. Environmental vs HAVC Systems

General Outcome:

2.0 The students should be able to understand and determine the appropriateness of various building components and HAVC systems for specific building uses and context.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 2.1 Understand and demonstrate a knowledge of the basics of heat flow.
- 2.2 Understand and demonstrate through calculations and diagrams the relationship between solar radiation and sun shading.
- 2.3 Identify, understand, and differentiate the various natural and mechanical ventilation concepts.
- 2.4 Understand and differentiate the various concepts using site analysis principles

Unit 3. Light, Sound, and Acoustics

General Outcome:

3.0 The students should be able to understand and calculate the relationships between natural and manmade sources of light and sound as they relate to functional and psychological comfort.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 3.1 Understand and apply the physics and perception of light in buildings.
- 3.2 Identify, understand, and utilize various light sources and systems.
- 3.3 Identify and understand the basics of physics as it relates to the perception of sound and building acoustics.
- 3.4 Understand and perform basic calculations as to the acoustical performance of various building envelope assemblies.

Unit 4. Sanitation and Plumbing Fundamentals

General Outcome:

- 4.0 The students should be able to identify, understand, and differentiate the advantages and disadvantages of various systems relating to sanitation and plumbing.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 4.1 Understand the basics of sanitation of past and present cultures.
- 4.2 Identify and understand the role water supply and related materials have in plumbing systems.
- 4.3 Understand proper waste disposal from buildings as it relates to our environment.
- 4.4 Identify, understand, and differentiate between the various waste disposal systems from their sources to their final destination.

Unit 5. Electrical Systems and Components

General Outcome:

5.0 The students should be able to demonstrate a basic working knowledge of the production of electrical energy, the components, and the devices used in its distribution in conjunction with various power demands.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

- 5.1 Identify and understand the production and distribution of electricity in present American society.
- 5.2 Understand and differentiate the advantages and disadvantages of various electrical systems.
- 5.3 Understand and perform basic calculations for small electrical wiring systems including sizes and over current protection.

Unit 6. Fire Safety, Vertical Transportation, and Technological Strategies

General Outcome:

6.0 The students should be able to apply the theory of emergency means of egress, vertical transportation systems, and the integration of building system technology with other building design systems.

Specific Learning Outcomes:

Upon successful completion of this unit, the students should be able to:

6.1 Understand the concepts and applications of fire safety in various types of buildings.

6.2 Understand and differentiate the advantages and disadvantages of various vertical transportation systems and their equipment.

6.3 Through individual student projects, various technological building systems will be presented in a comparative manner with other building design needs. Understand the context of the material in this course as it relates to other architectural courses.