

ADVANCED ARCHITECTURAL DESIGN

ESSENTIAL CURRICULUM

2008

Advanced Architectural Design

OVERARCHING GOALS

Unit: SR 1.1 Solar Space Heating / Alternative Energy Sources

Goal(s): Describe the importance of solar space heating.

Describe the different types of solar heat systems.

List the major alternative energy sources available for structures.

Objectives: At the completion of this unit, the student will be able to:

1. [CS] Describe the two basic types of solar space heating.
2. [CS] Explain how a passive solar space heating system works.
3. [TS] Compare direct, indirect and isolated passive solar-gain systems.
4. [TS] Identify the two most frequently used active solar systems.
5. [LS] List the advantages and disadvantages of solar space heating.
6. [TS] Describe the major alternative energy sources available for structures.

Unit: SR 1.2 Environmentally Friendly Green Homes (EFGH)

Goal: Determine what constitutes an environmentally friendly green home.

Objectives: At the completion of this unit, the student will be able to:

1. [CS] Describe the advantages and disadvantages of EFGH.
2. [LS] List the elements and factors that constitute an EFGH.
3. [TS] Design an draw, using CAD, an EFGH.
4. [CS] Explain how EFGH can reduce one's carbon footprint.

Unit: SR 1.3 Nontraditional Structures / New Products and Methods of Construction

Goal: Identify nontraditional structures and explain why they are more energy efficient.

Identify new products and methods of construction and evaluate each.

Objectives: At the completion of this unit, the student will be able to:

1. [CS] Explain the purpose of a large thermal mass in earth-sheltered dwellings.
2. [LS] List important site considerations for earth-sheltered buildings.
3. [CS] Explain why soil type is a major concern in the design of an earth-sheltered structure.
4. [CS] Summarize design variations of earth sheltered dwellings.
5. [CS] Explain why a dome structure generally has less heat loss than a conventional structure of comparable size.
6. [TS] Diagram how a typical dome provides free interior space.
7. [CS] Describe how a typical dome is constructed.
8. [LS] List several advantages and disadvantages of dome homes.
9. [CS] Describe the proper application of exterior insulation finish systems.
10. [CS] Explain the advantages and disadvantages of foam core structural sandwich panels in residential construction.
11. [TS] Select an appropriate alternative to traditional formed concrete wall systems.
12. [CS] Describe alternative concrete block construction products.
13. [CS] Describe the key elements in a frost protected shallow foundation.
14. [LS] Identify deck materials that are weather resistant.
15. [CS] Discuss the advantages and disadvantages of the Hebel Wall System

Unit: SR 1.4 Modular Applications**Goal: Apply modular concepts to the design of a simple residence.****Objectives:** At the completion of this unit, the student will be able to:

1. [LS] List the advantages of modular applications in the construction industry.
2. [TS] Apply modular concepts to the design of a simple residence.
3. [CS] Describe panelized construction.
4. [CS] Explain industrialized housing.

Unit: SR 1.5 Presentation Drawings / 3D Studio Design Software – Animation Walkthrough**Goal: Produce a rendering and animated walkthrough of a simple residence.****Objectives:** At the completion of this unit, the student will be able to:

1. [CS] Explain the purpose of a presentation drawing.
2. [LS] List methods commonly used to increase the degree of realism in a presentation plan.
3. [LS] Render presentation drawings using a variety of CAD software.
4. [CS] Explain entourage.
5. [CS] Describe lighting for a CAD 3D model to be rendered.
6. [CS] Explain walkthrough animation.
7. [TS] Produce a rendering of a simple residence.
8. [TS] Produce a animated walkthrough of a simple residence.

Unit: SR 1.6 Architectural Models**Goal: Construct an architectural model of a simple residence.****Objectives:** At the completion of this unit, the student will be able to:

1. [CS] Explain the various types of architectural models used to represent residential structures.
2. [LS] List the features commonly included in a presentation model.
3. [CS] Summarize the steps for constructing a balsa wood model.
4. [TS] Construct an architectural model of a simple residence.

Unit: SR 1.7 Material and Trade work Specifications

Goal: Identify material and trade work specifications for a simple residence.

Objectives: At the completion of this unit, the student will be able to:

1. [CS] Explain the purpose of material and trade work specifications.
2. [LS] List the sources of specification guides.
3. [TS] Identify the format followed by typical contract specification sheets.
4. [LS] Use a Description of Materials form.

Unit: SR 1.8 Architectural Remodeling, Renovation, and Preservation

Goal: Understands the types of remodeling and historical preservation.

Objectives: At the completion of this unit, the student will be able to:

1. [LS] List the reasons that people remodel and the factors they should consider before beginning a remodeling project.
2. [TS] Compare the five main types of remodeling according to cost, complexity, and time required.
3. [TS] Evaluate the needs of a family and select an appropriate type of remodeling.
4. [CS] Explain renovation.
5. [TS] Identify three types of historical preservation.
6. [CS] Explain the role of the family, interior designer, architect, and contractor in a remodeling, renovation, or preservation project.

Unit: SR 1.9 Designing for Health and Safety

Goal: Addresses health and safety factors when designing a simple residence.

Objectives: At the completion of this unit, the student will be able to:

1. [LS] Identify fire hazards around the home and explain preventative measures.
2. [CS] Explain the hazards associated with carbon monoxide and discuss preventative measures.
3. [CS] Explain the hazards associated with radon in residential housing and describe preventative measures.
4. [CS] Discuss problems in residential structures associated with excess moisture.
5. [CS] Describe the dangers associated with weather- and nature-related events such as earthquakes, floods, tornadoes, and hurricanes.
6. [LS] List steps that can be taken to mitigate the damage and destruction

Advanced Architectural Design Worksite Experience

Unit: SR 2.1 Site Based Mentorship

Goals:

- 1. Experiences realistic on-the-job training and educational opportunities that would not be available in the classroom environment.**
- 2. Develop a reflective document on the mentorship and lessons learned and experience gained.**
- 3. Develop a electronic media presentation about the mentorship experience and lessons learned.**

Objectives: At the completion of this unit, the student will be able to:

1. [CS] Describe the mentorship experience.
2. [TS] Produces a presentation about the mentor and the mentorship experience.
3. [TS] Documents the mentorship experience in a daily journal as a professional document.
4. [TS] Produces a “product” related to and beneficial to the mentor.
5. [LS] Makes a significant contribution to the mentor.
6. [LS] Recognizes that this is a professional environment and that conduct and dress must be appropriate.
7. [LS] Uses time efficiently and wisely while at the mentors site.
8. [TS] Reviews lessons and experiences learned daily to prevent duplicated effort by the mentor.
9. [TS] Abides by all rules, regulations and policies of the mentor site as well as those of the class and school system.

Unit: SR 2.2 In-House Projects

Goals:

- 1. Conducts in-depth research starting during the first semester for a historical presentation of an architectural period during the second semester.**
- 2. Conducts in-depth research during the first semester and collaborates with professional architects to design an energy free home during the second semester.**

Objectives: At the completion of this unit, the student will be able to:

1. [TS] Produce an error free publication on the historical research conducted on an architectural period.
2. [CS] Present historical research in the form of PowerPoint or similar presentation media.
3. [TS] Develop a complete set of construction documents for an energy free residence.
4. [LS] Create renderings for the energy free residence.
5. [TS] Produce an animated walkthrough for the energy free residence.
6. [TS] Produce a complete material listing and estimate for the construction cost for the energy free residence.
7. [LS] Create an architectural model for the energy free residence.
8. [TS] Produce a portfolio with all construction documents, renderings, photos of the architectural model, material list and construction cost.
9. [TS] Create a reflection document on the energy free residence project.