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.