Course Title: ***Advanced Architectural Drafting and Design*** 8/07

Credit: 1 Unit – 1 Year

Instructor: L. Westphal

Prerequisite: Successful completion of Architecture 1&2

Text: ARCHITECTURE RESIDENTIAL DRAFTING AND DESIGN, 9TH Ed., CLOIS E. KICKLIGHTER

Course Purpose:

The purpose of this course is to give students who are seriously considering a career in architecture or related fields an opportunity to expand their knowledge and experience. The scope of this course will be broader than Architectural Drafting 1-2. It will encompass all of Arch. Drafting 1-2 plus site, environmental, building code, cost, and legal issues. Students considering careers in Architectural Drafting, Architecture, or Architectural Engineering will benefit from this course.

Course Outcomes:

The student will:

1. Be able to properly use board drafting tools to make architectural drawings.
2. Review and apply design principles as he/she makes home designs.
3. Review and apply proper drafting techniques and architectural rules and standards.
4. Be able to properly use a Computer-Aided-Drafting program to make architectural drawings.
5. Learn and apply aspects of the following important architectural issues as they relate to planning and building structures; site selection, environmental concerns, building code requirements, cost analysis, and legal documents.
6. Design a full set of architectural plans to solve an architectural problem.
7. Use a variety of resources, including the Internet, to gather information relative to Architectural design and planning.
8. Write a report on a career related to the Architectural field.

Course Goals:

The student will:

1. Gain an appreciation of good design as it relates to buildings.
2. Appreciate the value of applying God's gifts of time and creativity as he/she solves an architectural problem.
3. Understand the value of proper planning
4. Learn more about himself/herself as to his/her ability to think and see abstractly and problem solve.
5. Value his/her math, science, and English classes as they relate to the field of Architecture.

COURSE OUTLINE:

Unit 1: Fundamentals of Design and Planning –

* Identify the historical influences that helped shape today's home designs
* Recognize and describe the elements of contemporary dwellings
* Find examples of various styles on the Internet and create a style reference book
TEXT: Pg. 17-35
Number of days: 13-15
S.O. – 2, 3, 4, 6, 7
D.O. – 3.1, 3.2, 3.4, 5.2, 5.3, 5.4, 6.2
W.S.S. - A2, A4, A7, B1, B5

Unit 2: Basic House Design

* List the four basic house designs
* Explain the chief advantages and disadvantages of each design
* List and describe 6 elements of design
* List and describe 10 principles of design
TEXT: Pg. 37-49
Number of days: 2-3
S.O. – 2, 3, 6, 7
D.O. – 3.4, 6.2, 6.3
W.S.S. - B1, B8

Unit 3: Primary Considerations

* Describe key site considerations, restrictions, zoning, and codes
TEXT: Pg. 51-65
Number of days: 2
S.O. – 2, 4, 5, 6
D.O. – 1.1, 3.1, 3.2, 3.3, 3.4, 4.2, 4.3, 5.3, 6.2
W.S.S. - A2, A3, A4, A7, B1, B2, B4, B8

Unit 4 Building Codes & Zoning

* Define or describe the following terms: building permit, zoning ordinances, building code, and Council of American Building Officials (CABO)
TEXT: Pg. 54 & 365-366
Number of days: 2-3
S.O. – 2, 6, 7
D.O. – 1.1, 3.4, 5.2, 5.3, 6.2, 6.3
W.S.S. - A2, A4, B2

Unit 5: Plot Plans

* Identify the various features shown on a typical plot plan
* Define or describe key terms - contour interval, contour lines, site plan, plot plan, landscape plan, property line, topographical features
* Using the computer, draw a plot plan given assigned information using correct symbols and conventions
* Create a landscape plan given assigned information
TEXT: Pg. 217-231

Number of days: 6-7
S.O. – 2, 4, 6, 7
D.O. – 1.1, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 6: Footings, Foundations, and Concrete
* List the major considerations when designing a footing
* Define or describe key terms - bearing wall, cement, concrete, dead loads, footings, live loads, slab foundation, T-Foundation
* Draw assigned foundations
TEXT: Pg. 233-258
Number of days: 6-7
S.O. – 2, 4, 6, 7
D.O. – 1.1, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B1, B2, B8

Unit 7: Sill and Floor Construction
* Define or describe key terms - engineered wood products (LVL, PSL, OSB), floor trusses, joists, platform framing
* Calculate proper joist sizes using a typical span data chart
TEXT: Pg. 273-296
Number of days: 2
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B1, B2, B8

Unit 8: Doors and Windows
* List the functions that doors and windows perform
* Draw proper door and window symbols for a typical floor plan
TEXT: Pg. 319-351
Number of days: 2-3
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B1, B2, B8

Unit 9: Stairs
* Define common stair terminology
* Design a stairway for a residential structure
* Perform stair calculations for a residential stairway
* Identify model code requirements for rise, run, headroom, handrails and guardrails
TEXT: Pg. 353-368
Number of days: 6-7
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 10: Fireplaces, Chimneys, and Stoves

* Identify the parts of a standard masonry fireplace and chimney
* Apply the appropriate principles to design a typical fireplace
TEXT: Pg. 319-351

Number of days: 3-4
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 11: Roof Designs

* Identify 10 different roof designs
* Draw in section a typical cornice
* Define basic roof-related terms
TEXT: Pg. 409-430
Number of days: 67
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 12 Perspective Drawings

* Explain the difference between one-, two-, and three-point perspectives
* Compare two-pt. perspective drawings to isometric and oblique pictorials
* Prepare a 2-pt. perspective drawing
TEXT: Pg. 239-247
Number of days: 5-6
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.4, 3.5, 5.2, 6.2
W.S.S. - B2, B8

Unit 13: Presentation Drawings

* Explain the purpose of a presentation drawing
* List methods commonly used to increase the degree of realism in a presentation plan
* Render presentation drawings using a variety of methods
TEXT: Pg. 636-660
Number of days: 3-4
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.4, 3.5, 5.2, 6.2
W.S.S. - B1, B2, B8

Unit 14: Architectural Models

* Explain the various types of architectural models used to represent residential structures
* List the features commonly included in a presentation model
* Construct a 3D model of a simple design
TEXT: Pg. 661-672
Number of days: 7-8
S.O. – 2, 4, 6, 7
D.O. – 1.1, 3.4, 3.5, 4.3, 5.2, 6.2
W.S.S. - B1, B2, B8

Unit 15: The Floor Plan

* List the information required on a typical floor plan
* Represent typical materials using standard architectural hatch patterns
* Dimension a floor plan in a clear and precise manner

TEXT: Pg. 389-408
Number of days: 2-3
S.O. – 2, 6, 7
D.O. – 1.1, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 16: Elevations

* List the features that should be included on an exterior elevation
* Identify the dimensions commonly shown on elevations
* Explain symbols that are often found on elevations
* Draw a typical exterior elevation that demonstrates proper techniques

TEXT: Pg. 431-447
Number of days: 3-4
S.O. – 2, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 17: The Electrical Plan

* Identify typical electrical symbols found on a residential electrical plan
* Draw an electrical plan for a residential structure (part of Architectural Drawing Set described below)

TEXT: Pg. 483-490
Number of days: 2-3
S.O. – 2, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, B8

Unit 18: New Products and Methods of Construction

* Explain the advantages and disadvantages of foam core structural sandwich panels
* Describe alternative concrete block construction products
* Identify deck materials that are weather-resistant

TEXT: Pg. 579-596
Number of days: 2-3
S.O. – 2, 6, 7
D.O. – 1.1, 3.5, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B1, B2, B8

Unit 19: Career Report

* Write a report on a career related to Architecture following the guidelines assigned in class

Number of days: 1-2
S.O. – 2, 4, 5, 6
D.O. – 3.2, 3.3, 3.4, 3.5, 5.4, 6.3 6.2, 7
W.S.S. - None

Unit 20: Architectural Drawing Problems & Sets

* Review the components of a complete set of Architectural Drawings
* Given an architectural problem (Skills USA contest problem), complete the solution
* Given a description of an architectural problem, create a full set of CAD drawings including; a plot plan, floor plan, foundation plan, full section, detail section, 4 elevations, interior elevations, a pictorial rendering, and a model.

Number of days: 65-70
S.O. – 2, 4, 5, 6, 7
D.O. – 1.1, 3.3, 3.4, 4.3, 5.1, 5.3, 5.4, 6.2, 6.3
W.S.S. - B2, C1, C3, C4, C6, C9

INSTRUCTIONAL STRATEGIES:

Lecture and demonstration: 10%

Class discussion: 5%

Individual classroom lab work: 85%

GRADING:

Quarter 1:
Assignments and drawings - 100%
Quarter 2:
Assignments and drawings - 100%

Final grade:
Semester 1: Quarter 1 - 50% Quarter - 50%

Quarter 3:
Assignments and drawings - 100%
Quarter 4:
Culminating Project (Full set of house plans) - 100%

Final grade:
Semester 2: Quarter 1 - 50% Quarter - 50%

APPENDIX:

COURSE: ADVANCED ARCHITECTURE
INSTRUCTOR: LEE WESTPHAL

Unit One: Fundamentals of Design and Planning
3.1 Recognize the need to be a life-long learner
3.2 Identify and evaluate trends in the work place
3.3 Identify their own personal abilities and interests
3.4 Develop their gifts
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely

Unit Two: Basic House Design
3.4 Develop their gifts
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Three: Primary Considerations
1.1 Apply the problem-solving process to challenging situations
3.1 Recognize the need to be a life-long learner
3.2 Identify and evaluate trends in the work place
3.3 Identify their own personal abilities and interests
3.4 Develop their gifts
4.2 Recognize environmental dangers
4.3 Practice Christian stewardship of natural resources
5.3 Produce products by using current technology
6.2 Communicate clearly and precisely

Unit Four: Building Codes & Zoning
1.1 Apply the problem-solving process to challenging situations
3.4 Develop their gifts
5.2 Explore technologies
5.3 Produce products by using current technology
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Five: Plot Plans
1.1 Apply the problem-solving process to challenging situations
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Six: Footings, Foundations, and Concrete
1.1 Apply the problem-solving process to challenging situations

5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Seven: Sill and Floor Construction
1.1 Apply the problem-solving process to challenging situations
3.5 Use abilities and interests for God pleasing recreation
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Eight: Doors and Windows
1.1 Apply the problem-solving process to challenging situations
3.5 Use abilities and interests for God pleasing recreation
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Nine: Stairs
1.1 Apply the problem-solving process to challenging situations
3.5 Use abilities and interests for God pleasing recreation
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Ten: Fireplaces, Chimneys, and Stoves
1.1 Apply the problem-solving process to challenging situations
3.5 Use abilities and interests for God pleasing recreation
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Eleven: Roof Designs
1.1 Apply the problem-solving process to challenging situations
3.5 Use abilities and interests for God pleasing recreation
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively.

Unit Twelve: Perspective Drawings
1.1 Apply the problem-solving process to challenging situations
3.4 Develop their gifts
3.5 Use abilities and interests for God pleasing recreation

5.2 Explore technologies
6.2 Communicate clearly and precisely

Unit Thirteen: Presentation Drawings
1.1 Apply the problem-solving process to challenging situations
3.4 Develop their gifts
3.5 Use abilities and interests for God pleasing recreation
5.2 Explore technologies
6.2 Communicate clearly and precisely

Unit Fourteen: Architectural Models
1.1 Apply the problem-solving process to challenging situations
3.4 Develop their gifts
3.5 Use abilities and interests for God pleasing recreation
4.3 Practice Christian stewardship of natural resources
5.2 Explore technologies
6.2 Communicate clearly and precisely

Unit Fifteen: The Floor Plan
1.1 Apply the problem-solving process to challenging situations
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Sixteen: Elevations
1.1 Apply the problem-solving process to challenging situations
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Seventeen: The Electrical Plan
1.1 Apply the problem-solving process to challenging situations
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Eighteen: New Products and Methods of Construction
1.1 Apply the problem-solving process to challenging situations
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit Nineteen: Career Report
3.2 Identify and evaluate trends in the work place
3.3 Identify their own personal abilities and interests
3.4 Develop their gifts
5.4 Produce products with high quality standards

6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Unit 20: Culminating Drawing Set
1.1 Apply the problem-solving process to challenging situations
3.3 Identify their own personal abilities and interests
3.4 Develop their gifts
4.2 Recognize environmental dangers
4.3 Practice Christian stewardship of natural resources
5.1 Apply mathematical and scientific principles to industrial applications
5.3 Produce products by using current technology
5.4 Produce products with high quality standards
6.2 Communicate clearly and precisely
6.3 Read technical literature and/or drawings effectively

Wisconsin State Standards

Unit 1: Fundamentals of Design and Planning
A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
A4 Explore the way in which human adaptive technological systems interact with ideological and sociological systems
A7 Explain how scientific and technological research can contribute to improved quality of life and a better standard of living
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B5 Asses the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials and processes is necessary to maintain and improve high productivity and quality

Unit 2: Basic House Design
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 3: Primary Considerations
A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
A3 Explain why decisions regarding the use of technology are dependent on the situation, application, or perception of the group using it
A4 Explore the way in which human adaptive technological systems interact with ideological and sociological systems
A7 Explain how scientific and technological research can contribute to improved quality of life and a better standard of living
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B4 Illustrate how resources are essential to technological activity but that their availability and quality vary extensively throughout the world
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 4 Building Codes & Zoning
A2 Understand that humans are faced with moral and ethical issues because technology is enabling very significant modifications to the natural world
A4 Explore the way in which human adaptive technological systems interact with ideological and sociological systems
B2 Demonstrate how systems are planned, organized, designed, built, and controlled

Unit 5: Plot Plans
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B5 Asses the impact new and improved products and services have had on the quality of life; explain how the development of new tools, materials and processes is necessary to maintain and improve high productivity and quality
C2 Measure, collect, and analyze data in order to solve a technological problem
C4 Select materials and other resources for a technological design and develop practical solutions
C11 Select and apply appropriate processes to alter the characteristics of material to make it useful in different situations

Unit 6: Footings, Foundations and Concrete
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 7: Sill and Floor Construction
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 8 : Doors and Windows
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 9: Stairs
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 10: Fireplaces, Chimneys, and Stoves
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 11: Roof Designs
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 12: Perspective Drawings
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 13: Presentation Drawings
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 14: Architectural Models
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 15: The Floor Plan
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 16: Elevations
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 17: The Electrical Plan
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 18: New Products and Methods of Construction
B1 Identify and explain the ways technological systems have evolved and will continue to evolve to satisfy human needs and desires
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
B8 Select and apply appropriate processes to transform information into its most useful format

Unit 19: Career Report
W.S.S. - None

Unit 20: Architectural Drawing Set
B2 Demonstrate how systems are planned, organized, designed, built, and controlled
C1 Implement and evaluate strategies to solve technological problems that are likely to be successful
C3 Defend solutions to technological problems and opportunities
C4 Select materials and other resources for a technological design and develop practical solutions
C6 Design and/or create solutions that are functional, aesthetically pleasing, demonstrate quality, have value greater than the investment, and meet a societal want or need
C9 Apply basic engineering concepts