

Mercer County Community College

Arts and Communication Division

ABT 124

ARCHITECTURAL GRAPHICS II

COURSE DESCRIPTION

Development of skills in visual expression is continued from ARC121. Basic instruction in preparing architectural working drawings and the gathering of references to serve in design and construction principles will be offered. The intent is to enable the student to communicate and express architectural construction information using professional graphic techniques in a forthright efficient manner.

Text (s): **Architectural Drafting and Design** by Alan Jefferis-David A. Madsen
 Wood Frame House Construction by L. O. Anderson

Prerequisites: **ABT 120 or permission of instructor**

Co-requisites:

Credits: 4

Lecture Hours: 2

Studio/Lab Hours: 6

Food and Drink are strictly prohibited in Classrooms as per Health and Safety Laws. Students are not permitted to bring in chemicals or cleaning fluids without the appropriate MSD Sheets.

Course Coordinator: John Santosuosso

Latest Review: Spring 2005

I. GENERAL OBJECTIVES

1. To continue developing the abilities of the student to use the mechanical tools and aids of the trade to sharpen his visual perception and graphic expression.
2. To develop skills that will prepare the student for work in the field or for continuing his education.
3. To acquaint the student with the more practical aspects of technical design.
4. To enlarge the graphical vocabulary of the student so he will have a number of choices from which to pick in order to solve functional design problems found in detailing for actual construction.
5. To heighten the student awareness of the typical problems encountered in construction due to improper or inept detail design.

UNIT 1 - SITE & PLOT PLANS

Time: 3 Weeks - Reading - Arch. Section 9

Objectives:

The student should be able to:

1. Demonstrate the difference between a site and a plot plan.
2. Draw with dispatch and accuracy all the symbols and notations required on typical site or plot plans.
3. Place on a contour site all the elements which go to make an acceptable plan.
4. Read a site or plot plan and note errors, omissions, and/or make recommendations for improvements.
5. Indicate items which are used to define general landscaping.

Specific Objectives:

The student will be able to:

1. Read, draw and change contour lines correctly.
2. Correctly place on a site such items as:
 - a. Length & bearing of property lines
 - b. Architectural features, i.e.:
 1. boulders
 2. trees & shrubs
 3. buildings
 4. elevation
 5. contour lines
 6. direction indicator
 7. etc.
 - c. Utilities
 - d. Fences and retaining walls
 - e. Culverts and drainage ditches
 - f. Manholes, storm drains, fire hydrants
 - g. Easements & set-backs
 - h. Location and address
 - i. Ownership

Specific Objectives:

3. Define such words used in connection with site or plot plans such as:

a. heading	e. lot number
b. bearing	f. easement
c. bench mark	g. elevation
d. stake	h. etc.

- 4. Locate set-back code and construction restriction from local municipal offices or reference material.
- 5. Draw reasonably well the various symbols used for trees, shrubs, hedges, and other plantings.

UNIT II - FLOOR PLANS

Time: 3 Weeks - Reading - Arch. Sections 2 & 3
- Wood. Chapters 1 through 4, 27 & 31

Specific Objectives:

The student should be able to:

- 1. Detail a given floor plan with all necessary symbols and markings.
- 2. Dimension a given floor plan with dispatch.
- 3. Suggest sizes of rooms for various uses.
- 4. Show which rooms should be made to be adjacent.
- 5. Know and demonstrate the use of material symbols to show material, texture, size, and shape.
- 6. Layout a floor plan of reasonable complexity based on a set of given requirements.

Specific Objectives:

The student should be able to:

- 1. Layout a designated floor plan.
- 2. Dimension a floor plan for construction purposes.
- 3. Use proper labels, symbols, room names, and material call-outs.
- 4. Properly use and place notes.
- 5. Use correct size when indicating normal materials of construction.
- 6. Indicate by using proper symbols such items as:

a. doors	f. stairs
b. window	g. walks, patios, & decks
c. kitchen equipment	h. garage & sheds
d. fireplaces	i. normal furniture

- 7. Use ready-made templates for the various items aforementioned.
- 8. Find sizes and recommend dimensions for items or space requirement in the literature, i.e.

a. Sweets	c. Time Saver
b. Architectural Standards	d. etc.

UNIT III - FOUNDATIONS & FOOTINGS

Time: 2 Weeks - Reading - Arch. Sections 4 & 12
- Wood. Chapters 5 through 11, 26

General Objectives:

The student should be able to:

1. Layout and plan the excavation for a small building.
2. Recognize and detail the various types of footings.
3. Design the width and thickness of non-reinforced footings according to the standard practice method for light construction.
4. Recognize and detail the various types of foundations used for small buildings.
5. Locate the local code stating the depth of the frost line and know to what it refers.
6. Specify and give adequate notes to the builder in order to secure the footing and foundation desired.

Specific Objectives:

The student will be able to:

1. Stake out for an excavation of a small building.
2. Define and explain the use of batter boards.
3. State the minimum elevation that is desirable for the foundation to extend below and above grade.
4. State why footings are used.
5. Design a non-reinforced concrete footing based on wall thickness for residential construction.
6. Name and draw foundations made with the normal materials used in foundation work.
7. Indicate when the various shapes of footings should be used such as:

a. stepped	e. stone
b. cast	f. slab
c. block	g. others
d. brick	

8. Draw and detail piers and posts.
9. Properly specify and detail pilasters.
10. Define and draw details of corbelling.
11. Compute the load of a residential floor and select a standard steel beam for the central support of a house using tables found in the text.
12. Detail and use lintels properly.
13. Draw common block and brick details using the correct actual dimensions.
14. Define parging.

15. Draw a foundation plan which may include but not be limited to the following:

a. footings	g. beams	m. fixtures
b. piers	h. anchors	n. heater & hot water tank
c. columns	i. crawl space	o. fuel tank
d. pilasters	j. drains and sump	p. utilities
e. foundation walls	k. stairs	q. etc.
f. openings	l. walls & doors	

16. Completely dimension the foundation plan in English or metric measurements.
17. Draw all pertinent section details necessary to give the excavator and mason proper information for execution of the work.
18. Use proper material symbols and true sizes for all materials indicated and called out.
19. Define and specify the proper use of dry-walls on foundation drawings.
20. Properly use section notations.

UNIT IV - FLOOR, WALL & ROOF CONSTRUCTION

Time: 3 Weeks - Reading - Arch. Sections 5, 6 & 7
 - Wood. Chapters 12 through 15, 20 & 29

General Objectives:

The student should be able to:

1. Draw details describing precise methods for the complete construction of floor, wall, and roof construction of light frame buildings.
2. Select from given tables the proper size of sill, joists, studs and rafters for incorporation into a light frame structure.
3. Graphically show the three main types of frame construction.
4. Identify most items or pieces of the structure with proper names.
5. Recognize and name the various styles of roofs.
6. Draw the structure of each style of roof using the correct true size of materials using either English or metric dimensions.

Specific Objectives:

The student will be able to:

1. Draw the details of platform framing.
2. Draw the details of balloon framing.
3. Draw the details of post and beam framing.
4. Define, specify, and draw such items in a floor frame construction as:

a. sill	f. bridging	k. brick ledge
b. anchor bolt	g. fire stops	l. flashing
c. joist	h. bearing wall	m. will ties
d. sole	i. termite shield	n. etc.
e. header	j. fire cut	

5. Accurately prepare construction drawings, of walls and wall sections.
6. Define, specify, and draw items which may be found in a frame wall such as:

a. sole	l. trimmers
b. stud	m. cripples
c. plate	n. molding
d. header	o. joists
e. brace	p. rafters
f. let-in-brace	q. vapor barrier
g. blocking	r. insulation
h. fire stop	s. weep holes
i. ledger	t. trim
j. sheathing	u. gutter
k. siding	v. etc.

7. Recognize, describe and draw at least ten styles of roofs.
8. Use the rafter span data tables to choose proper size and quality of lumber to specify and draw plans for a working roof.
9. Define, specify, and draw items which may be found in a framed-out roof structure such as:

a. rise and run	j. frieze
b. pitch	k. drip cap
c. rafter	l. flashing
d. valley	m. soffit
e. gable	n. ridge
f. birds mouth	o. gussets
g. hip	p. counter-flashing
h. lookout	q. truss
i. fascia	

10. Draw scale details of all aforementioned items using true sizes as well as indicating nominal dimensions.
11. Dimension all details in both English and metric units.

UNIT V - DOORS, WINDOWS, & STAIRS

Time: 1 Week - Reading - Arch. Sections 6 & 11
 - Wood. Chapters 16 through 24, 28 & 30

General Objectives:

The student should be able to:

1. List the styles and types of doors and windows generally used in a residential building.
2. Apply to the construction plans proper symbols representing the style of door or window required for the building under consideration.
3. Review the literature to find suitable units for incorporation into the building.
4. Set up and compile adequate door and window schedules.
5. Name and detail the various types of stairways.
6. Set up proper runs necessary to keep standard riser dimensions for any given elevation.

Specific Objectives:

The student will be able to:

1. List and describe at least ten types of doors.
2. List and describe at least six types of windows.
3. Draw detail drawings of standard styles of doors and windows.
4. Create construction drawings necessary for the incorporation of any given window or door into a frame structure allowing for proper clearances while maintaining structural integrity.
5. Locate in the literature door and window details necessary for the production of construction drawings or special doors of windows and their subsequent incorporation.
6. Define, specify, and draw items which may be found in connection with door and window details such as:

a. panel	k. mullion
b. rail	l. sash
c. stile	m. lite
d. saddle	n. stile
e. trim	o. head
f. blocking	p. rail
g. jamb	q. casing
h. buck	r. glazing
i. stop	s. muntin
j. sill	t. etc.

7. Design treads and risers for a given total rise.
8. Indicate knowledge of maximum total rise before a platform becomes necessary.
9. Demonstrate knowledge of limitations on step riser dimensions and their variation.
10. Draw detail drawings for the construction of a set of stairs with all proper call-outs and dimensions.
11. Define, specify, and draw items in connection with stairs and stairwell construction such as:

a. double trimmers	g. newel
b. head room	h. landing
c. treads & risers	i. nosing
d. story	j. stairwell
e. stringer	k. etc
f. baluster	

12. Draw to proper size and dimension all aforementioned items in both English and metric units.

UNIT VI – PRESENTATION

Time: 3 Weeks - Reading - Arch. Sections 10 & 13

General Objectives:

The student should be able to:

1. Create working detail of any portion of a frame structure drawn and noted to a quality suitable to be judged by peers and professionals of the trade.
2. Draw buildings or parts of buildings in a form more meaningful to a client than blueprints.
3. Demonstrate the techniques and information obtained in ARC121 concerning shades, shadows, entourage, and rendering.
4. Design and build small demonstration models or parts or sections of buildings as well as full models.
5. Stand in front of a group and explain and/or defend his/her drawings and models with a measure of professional grace and poise.
6. Relate to the processes by which the Architect sells ideas to a prospective client.

Specific Objectives:

The student will be able to:

1. Draw accurately in either pencil or ink any construction detail plan, or elevation needed to demonstrate the order and method by which actual construction would be accomplished for any part of a frame building.
2. Draw plans, elevations, and sections of both exteriors and interiors of a building using both isometric and oblique methods, (perspective drawings may also be acceptable).
3. Make a model, whole or in part, which will demonstrate a function of construction.
4. Render with shades, and shadows any orthographic elevation of a building to assist in the explanation of the construction drawings.
5. Bring together a set of drawings and model(s) which may be used as an aid to explain to a client the construction details which may be encountered in the building of a structure.
6. Speak and demonstrate his expertise before his peers or professionals of the trade in explaining the details of a set structure.

II. EVALUATION

Each assignment or project will be evaluated on completeness, appearance, compliance, and effort displayed. Linework and lettering will weigh heavily as they greatly affect appearance. Compliance with directions and effort shown by good work turned in when due and evidence of research will lead to the better grades.

Completeness and the use of proper graphic techniques will be taken as evidence of understanding. Project assigned will attempt to cover a good portion of the items mentioned in each unit. Short word tests will be given each week some time during the office practice period which will cover other material, terms, definitions, and items presented in lecture or assigned from the texts or accompanying literature.

A presentation before a jury will be required for completion of Unit VI. The presentations will be scheduled by lot during the last week of the semester.

Projects	65%
Tests	20%
Presentation	<u>15%</u>
	100%

III. REFERENCE TEXTS

<u>Architecture in Wood</u> , H.J. Hansen Viking 1971	<u>Specifying Building Construction</u> , D. Gae, Van Nostrand
<u>Construction Management and Contracting</u> , Prentice Hall 1973	<u>Construction Contracting</u> , R.H. Clough, Wiley
<u>Architectural Illustration Guides</u> , Instant Landscape	<u>Guide to Site and Environmental Planning</u> , H.M. Rubenstein, Wiley
<u>Homes Are for People</u> , St. M. Satenig Wiley	<u>Timber Construction Standards</u> , AITC, American Institute for Timber Construction
<u>Directing Construction for Profit</u> , S.P. Oppenheimer McGraw-Hill	<u>Architectural Graphic Standards</u> , C. Ramsey, Wiley
<u>Uniform Building Code</u> , International Conference of Building Officials	<u>Time Saver Standards for Architectural Design</u> , C. Callendar
<u>Carpentry in Residential Construction</u> , S. Badzinski, Prentice	<u>Simplified Design of Roof Trusses for Architects and Builders</u> , C. Parker
House and Home, (Bi Weekly Magazine)	<u>Architectural Drafting</u> , G.K. Stegman American Technical Society
<u>Graphic Architectural Drafting</u> , J.E. Ray, McKnight	<u>General Architectural Drawing</u> , W.E. Wyatt, C.A. Bennett Co., Inc.
<u>Architectural Drawing & Planning</u> , Goodban & Hayslett, McGraw-Hill	<u>Construction Drafting</u> , L. Hooper Prentice
<u>Architectural Drafting and Design</u> , E.R. Weidhaas, Allyn & Bacon	