

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON.

COURSE OUTLINE

**COURSE TITLE:** Drafting and Design  
**COURSE CODE:** ARC 111  
**PROGRAM:** Architectural Technician/Technology  
**SEMESTER:** I (Fall)  
**AUTHOR:** B. Sparrow B1165 Phone 759-2554 X 585  
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**DATE:** September 1994  
**PREVIOUSLY DATED:** June 1992

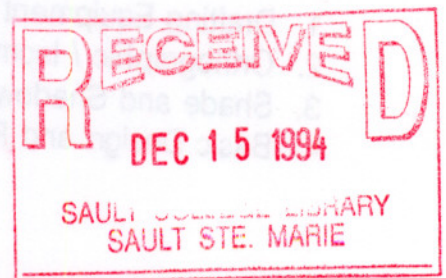
*M. Thorne Aug 24/94*

**APPROVED:** *L. Bequette*  
(DEAN)

**DATE:** 94.08.24

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(COORDINATOR)

**DATE:** \_\_\_\_\_



**TOTAL HOURS PER WEEK: 6****PREREQUISITES: NONE**

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**I. PHILOSOPHY AND GOALS**

This course provides the student with an introduction to the fundamentals of drafting, design, wood frame construction, and development of skill in technical and design drawing using a variety of media. The student will demonstrate these skills and knowledge by preparing design and working drawings for a small project.

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**II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES)**

Upon successful completion of the course, the student will be able to:

1. Demonstrate proper use of drafting equipment.
  2. Draft using pencil and pen and ink on paper and vellum.
  3. Demonstrate consistent hand lettering using pencil.
  4. Distinguish and demonstrate appropriate use of line weight.
  5. Use imperial and metric architectural scales.
  6. Understand and draw orthographic projections.
  7. Identify and draw isometric and oblique views.
  8. Draw shade and shadow using 45 light projection.
  9. Solve a pedestrian circulation problem.
  10. Identify and describe components of residential wood frame construction.
  11. Use OBC span tables to size beams and joists for wood frame construction.
  12. Draw details of wood frame assemblies, given samples.
  13. Apply material rendering techniques.
  14. Develop model construction techniques using cardboard.
  15. Design and prepare working drawings for a single family residence.
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**III. TOPICS TO BE COVERED**

1. Drafting Equipment Use and Techniques
2. Orthographic / Isometric and Oblique Drawing
3. Shade and Shadows / 45 Light Projection
4. Basic Design and Presentation Drawings / Ink on Vellum

5. Single Family Residential Design
  6. Wood Frame Construction and Foundations
  7. Residential Design Drawings
  8. Model Building
  9. Basic Working Drawings
  10. Dimensioning and Detailing Wood Frame Construction
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#### IV. LEARNING ACTIVITIES / REQUIRED RESOURCES

##### 1.0 DRAFTING AND DRAFTING EQUIPMENT AND TECHNIQUES

- 1.1 Name, use and care for the various drafting instruments.
- 1.2 Watch demonstration of correct drafting techniques.
- 1.3 Understand the application of, and practice and develop skill in hand lettering.
- 1.4 Apply and differentiate line types and weights.
- 1.5 Utilize and read architectural scales - metric and imperial.
- 1.6 Practice line drawing assignments using drafting equipment.

**Resources:** Texts: Architecture...Chapter 5, Architectural Graphics...Chapters 1,2 and 5  
Drafting Equipment, 8.5X11 plain bond paper

##### 2.0 ORTHOGRAPHIC PROJECTION AND ISOMETRIC AND AXONOMETRIC DRAWINGS

- 2.1 Define various types of views and understand their applications.
- 2.2 Understand and draw orthographic projections of objects.
- 2.3 Construct an isometric view of an object given plan and elevation views.
- 2.4 Construct a plan oblique (axonometric) view of an object given plan and elevation views.

**Resources:** Texts: Architectural Graphics...Chapter 3 pp. 20-43  
11X17 Vellum, Drafting Equipment

##### 3.0 SHADE AND SHADOW USING 45 (CONVENTIONAL) LIGHT DIRECTION

- 3.1 Define the conventional light source and its application.
- 3.2 Construct shadows for plan and elevations views of objects given light direction.
- 3.3 Construct a paper model of an object to analyze the shadow in 3 dimensions.

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3.4 Understand the use of shade and shadow as a design consideration and presentation tool.

**Resources:** Text: Architecture...Chapter 4 pp. 107-112, Architectural Graphics...Chapter 4 pp. 84-88  
11X17 Vellum, Drafting Equipment, White Mayfair Card or Bristol Board

#### 4.0 BASIC DESIGN AND PRESENTATION DRAWINGS - INK ON VELLUM

- 4.1 Solve a pedestrian circulation design problem.
- 4.2 Present design drawings using technical pens on vellum.
- 4.3 Understand and apply modular component usage in design.

**Resources:** Architectural Graphics...Chapter 4  
24X36 Vellum, Drafting Equipment, Technical Pen Set  
Sketch Tissue

#### 5.0 RESIDENTIAL DESIGN

- 5.1 Discuss the issues for planning a house in Canada.
- 5.2 Design a small house plan and elevations given a site and a set of parameters.

**Resources:** Texts: Architectural Graphics...Chapter 3, Chapter 6,  
pp. 116-121. Architecture...Chapter 2, Chapter 3, Chapter  
4 pp. 93-107  
24X36 Vellum, Drafting Equipment, Sketch Tissue

#### 6.0 WOOD FRAME CONSTRUCTION

- 6.1 Identify and detail types of foundation assemblies.
- 6.1 Identify and name the components of a platform framing system.
- 6.2 Design and detail a stair to conform the Ontario Building Code.
- 6.3 Use the OBC to determine the size and spacing of beams and joists.
- 6.4 Draft wood frame detail assemblies given a sketch.

**Resources:** Texts: Architecture...Chapters 7, 8, and 9,  
Ontario Building Code (1990) Part 9 and Appendices.  
Handouts, 24X36 Vellum, Drafting Equipment

## 7.0 RESIDENTIAL DESIGN PRESENTATION DRAWINGS

- 7.1 Prepare a set of design presentation drawings, including site and floor plans, section, elevations and axonometric of a residence.
- 7.2 Give an oral presentation and explanation of a design project.

**Resources:** Texts: Architecture Chapter 15 pp. 401-408  
Architectural Graphics... Chapters 3 and 4  
24X36 Vellum, Drafting Equipment, Sketch Tissue, Blueline  
or Blackline Print Paper

## 8.0 MODEL BUILDING

- 8.1 Discuss uses and types of architectural models.
- 8.2 Examine model construction materials and techniques.
- 8.3 Construct a scale massing model of a small residential dwelling.

**Resources:** Text: Architecture... Chapter 15 pp. 398-401  
Drafting Equipment, White Mayfair Card or Bristol Board,

## 9.0 DIMENSIONING AND DETAILING WOOD FRAME CONSTRUCTION

- 9.1 Learn and apply standard dimensioning techniques.
- 9.2 Understand a draw details of wood frame assemblies.
- 9.3 Practice and utilize conventions of component identification and graphic representation.

**Resources:** Texts: Architecture... Chapter 6 and 7, Manual on Metric Building Drawing Practice  
Drafting Equipment, 8.5X11 Vellum

## 10. BASIC WORKING DRAWINGS

- 10.1 Discuss the function of working drawings.
- 10.2 Examine the drawing conventions of working drawings.
- 10.3 Produce a partial set of working drawings using accepted graphic methods.
- 10.4 Examine reproduction techniques for drawings.
- 10.5 Operate a print machine to produce a set of 'blueprints'.

**Resources:** Texts: Architecture...Chapter 5,6 and 7, Manual on Metric Building Drawing Practice  
 Drafting Equipment, 24X36 Vellum  
 Blueline or Blackline Print Paper

## V. METHOD OF EVALUATION

Students will be assigned a final grade based on successful completion of tests, assignments, projects and attendance, weighted as follows:

Assignments and Tests	30%
Minor Drafting Assignment	15%
Major Assignment	
Design Phase	15%
Working Drawings	20%
Model	10%
Attendance	10%
<b>TOTAL</b>	<b>100%</b>

Late assignments will be penalized 10% for each day late. Assignments more than three days overdue will receive a grade of zero. Attendance and punctuality will be considered in the student assessment.

A final letter grade will be assigned as follows:

A+	90-100%
A	80-89%
B	70-79%
C	55-69%
R	Repeat

## VI. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult with the

instructor. Credit for prior learning will be given upon completion of the following:

1. A portfolio of representative work including design and working drawings completed by the individual that adequately demonstrates: drafting skill, knowledge of wood frame construction techniques, wood frame detailing, residential design, and standard methods of graphic representation.
  2. Successful completion of a drafting test under the supervision of the instructor or the instructor's representative.
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#### **VII. REQUIRED STUDENT RESOURCES:**

Architecture: Design Engineering Drawing  
Latest Edition  
William P. Spence  
Glencoe

Architectural Graphics  
Second Edition  
Francis Ching  
Van Nostrand Reinhold

Manual on Metric Building Drawing Practice  
National Research Council of Canada

Architectural Drafting Equipment Kit  
Architectural Technical Pen Set

In addition to those materials provided in the kit, the student will be expected to supply various other media and materials necessary to complete the assignments and projects.

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#### **VIII. ADDITIONAL RESOURCES AND MATERIALS**

There are available in the library a number of texts and periodicals on design, drafting and construction:

Texts: (Reference Area) ● Architectural Graphic Standards  
Ramsay/Sleeper  
● Canadian Wood Frame House Construction  
Second Metric Edition  
CMHC  
● Time Saver Standards for Architectural Design Data  
John Callender

Texts: ● Design with Climate Victor Olgyay  
● Architectural Drafting and Construction Ernest Weidhaas  
● A Guide to Professional Architectural and Industrial Scale Model Building Graham Pattinson  
● Building Construction Illustrated Francis Ching

Periodicals: ● Progressive Architecture  
● Architecture  
● Fine Homebuilding  
● The Canadian Architect

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## IX. SPECIAL NOTES

1. Students with special needs are encouraged to discuss required accommodations in confidence with the instructor.
  2. The instructor reserves the right to modify the course and course outline as deemed necessary to meet the needs of the students.
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## X. COURSE ANALYSIS SHEET (ATTACHED)



## COURSE ANALYSIS FORM

<b>Drafting and Design ARC 111                      Architectural Technician/Technology</b>		
<b>LEARNING OUTCOMES</b>	<b>BROAD AREAS OF CONTENT</b>	<b>INDICATORS OF SUCCESS</b>
1. Draw technical drawings with clarity and precision using accepted graphic methods.	--use of hand lettering --principles of line weight and line type --use of drafting instruments --employment of various drawing media	Portfolio examples of manual drafting clearly demonstrating achievement of techniques, or demonstration of technique in challenge test.
2. Interpret orthographic drawings and generate three dimensional views.	--three dimensional cognition --constructing views using orthographic projection --use of isometric and axonometric views --use of shade and shadow	Portfolio examples or demonstration of understanding in challenge test.
3. Understand basic elements of wood frame detailing and construction.	--components of wood frame construction --principles of detailing and component identification.	Portfolio examples or demonstrated knowledge of wood frame construction in challenge test.
4. Design a single family residence of wood frame construction.	--site analysis --by-laws and codes --spatial manipulation, patterns of people movement, conventional spatial relationships	Portfolio examples of design work or demonstration of design and spatial understanding in challenge test.
5. Build a cardboard scale model.	--use of scale models to study design --three dimensional understanding	Portfolio examples or demonstrated three dimensional understanding in challenge test.
6. Understand and prepare working drawings including dimensions and details.	--assemble graphic and text information logically and with clarity	Portfolio examples of working drawings or demonstration of knowledge in challenge test

