

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON.

COURSE OUTLINE

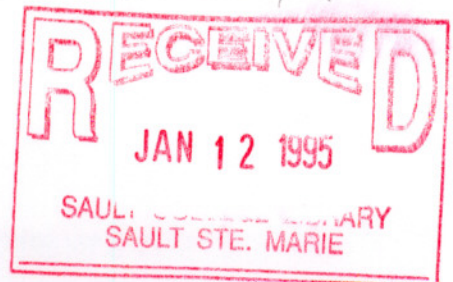
COURSE TITLE: Drafting and Design
COURSE CODE: ARC 212 (Incorporating ARC 232)
PROGRAM: Architectural Technology
SEMESTER: IV (Winter)
AUTHOR: B. Sparrow
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DATE: 3 January 1995
PREVIOUSLY DATED: 7 January 1993

APPROVED: _____ **DATE:** _____
(COORDINATOR)

APPROVED: *L.P. Crayth* **DATE:** 95-01-04
(DEAN)

M. [Signature]

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TOTAL CREDIT HOURS: 6
PREREQUISITES: ARC 202 CAD 222

I. PHILOSOPHY AND GOALS

This course provides an opportunity for the student to synthesize material developed in previous drafting and CAD courses. The students will have to design and detail a single family dwelling to meet R-2000 standards, and perform an energy audit using HOT-2000 software. Additionally, the student will have to prepare complete design and working drawings using CAD (AutoCad and ASG) including 3D modelling.

II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES)

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

1. Understand the requirements for design of a single family residential dwelling incorporating energy efficient design.
 2. Construct a presentation model of a single family dwelling.
 3. Draw and plot a CAD generated perspective.
 4. Understand the concept of R-2000 and R-2000 technology in residential design.
 5. Develop an energy model and perform an energy audit and analysis using HOT-2000 software.
 6. Design and present construction details in CAD meeting R-2000 requirements.
 7. Understand and use ASG Core and Architectural CAD software.
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III. TOPICS TO BE COVERED

1. Residential site planning and design.
2. The R2000 concept and energy efficient design and construction.
3. Passive solar design.
4. ASG Architectural software.
5. HOT2000 energy modelling.
6. Three dimensional computer modelling

IV. LEARNING ACTIVITIES / REQUIRED RESOURCES

1.0 RESIDENTIAL SITE ANALYSIS AND DESIGN

- 1.1 Discuss aspects of residential site planning.
- 1.2 Examine environmental, energy and landscape design issues.
- 1.3 Review and interpret zoning regulations and by-laws.
- 1.4 Discuss the zoning / site plan approval process.
- 1.5 Prepare a site analysis drawing.

2.0 R2000 CONSTRUCTION AND DESIGN

- 2.1 Review current texts and periodicals related to innovative design and technology.
- 2.2 Examine R2000 technology and related wood frame detailing.
- 2.3 Propose alternative energy efficient systems and details.
- 2.4 Design an single family dwelling conforming to R2000 standards.
- 2.5 Prepare working drawings using CAD for a single family residence.
- 2.6 Build a presentation model of a site and single family residence.

3.0 PASSIVE SOLAR DESIGN

- 3.1 Examine examples and principles of passive solar design.
- 3.2 Describe the function of a Trombe wall.
- 3.3 Compare the concepts of "light and tight" versus "mass and glass".

4.0 AUTOCAD AND ASG (ARCHITECTURAL)

- 4.1 Understand and start ASG Core utilities and load ASG Architectural
- 4.2 Review architectural pulldowns, settings and toggles.
- 4.3 Understand and use the AutoLayer function.
- 4.4 Understand and apply dimensions and annotations.
- 4.5 Apply symbols, assign and extract attributes, and use tags.

5.0 ENERGY MODELLING USING HOT2000

- 5.1 Discuss application of energy modelling software.
- 5.2 Examine menu structure of HOT2000.
- 5.3 Manipulate data in a sample file and examine output.
- 5.4 Input data and develop and energy model for a single family residence.
- 5.5 Propose detail and system changes to maximize energy efficiency.

6.0 THREE DIMENSIONAL MODELLING USING CAD

- 6.1 Review of the 3D level in AutoCad.
- 6.2 Understand and use AutoShade to view 3D models.

- 6.3 Examine and draw elevation and section views.
 - 6.4 Convert 2D to 3D and 3D to 2D.
 - 6.5 Use ASG Producer to create and view perspective views.
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V. METHOD OF EVALUATION

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

Site Analysis	10
R2000 Design Project	20
HOT2000 Energy Model Analysis	10
Presentation Model	15
3D CAD Model	15
Technical Details	15
CAD Working Drawings	15

TOTAL	100%
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Assignments more than one week late will not be accepted. Absenteeism will not be tolerated. It is the student's responsibility to obtain notes, handouts and other materials missed due to absence.

A final letter grade will be assigned as follows:

A+	90-100%
A	80-89%
B	70-79%
C	55-69%
R	Repeat (Objectives have not been met)

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, and

reports completed by the individual that adequately demonstrates: drafting skill, CAD proficiency (including 3D modelling) knowledge of energy efficient construction techniques, residential design and site planning, passive solar design concepts, R2000 construction and energy modelling using HOT2000.

2. Successful completion of a practical drafting and/or CAD test under the supervision of the instructor or the instructor's representative.

VII. REQUIRED STUDENT RESOURCES

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

Architectural Details for Insulated Buildings
Ronald Brand
Van Nostrand Reinhold

AutoCad and its Applications
Release 12
Shumaker/Madsen
Goodheart-Willcox

Architectural Drafting Equipment Kit
Plotter Pens

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

VIII. ADDITIONAL RESOURCES AND MATERIALS

Architectural Graphic Standards
Ramsey/Sleeper
Latest Edition
John Wiley & Sons

Fine Homebuilding
The Taunton Press

ASG Reference Manual
HOT2000 Reference Manual

CHBA Builders Manual

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

IX. 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.

X. COURSE ANALYSIS SHEET (ATTACHED)