

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY
SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: CONSTRUCTION MATERIALS

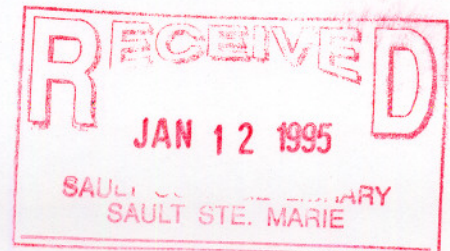
CODE NO.: ARC 133 **SEMESTER:** 11

PROGRAM: ARCHITECTURAL TECHNOLOGY

AUTHOR: M.URSELL

DATE: JAN 5/95 **PREVIOUS OUTLINE DATED:** MARCH 1979

APPROVED: *L.P. Choquette* 95-01-04
DEAN **DATE**



Topic Number	Periods	Topic Description	Reference
1	2	<u>Introduction</u> Terminology - load - stress - strain - classical Materials - contemporary materials	
2	16	<u>Cement, Aggregates & Concrete</u> - history of cement - types of cement and their applications - cement additives - design of concrete mixes - concrete testing methods - types of aggregates - tests for aggregates - quality control of concrete - proper placing of concrete	
3	12	<u>Wood</u> - structure and properties - uses of wood in the construction industry - types of lumber - lumber grading - tree classifications - framing lumber use - structural characteristics of various lumber samples - timber beam design - plywood manufacture - plywood grades - plywood types and finishes - plywood strength	
4	12	<u>Steel and Nonferrous Metals</u> - history of steel production - the manufacture of steel - types of steel - steel shapes used in Architecture - structural tests on various steel samples - the manufacture of aluminum - aluminum extrusion processes - uses of aluminum in Architecture	
5	12	<u>Brick & Tile & Stone</u> - types of mortar - masonry terminology - types of brick and tile - types of concrete block - tests on brick and block samples - manufacture of brick and tile - acoustic, fire, and N.C.R. ratings of concrete block brick & tile	

13. The student will outline the design of a concrete mix.
14. The student will identify the slump test.
15. The student will identify the compressive strength and the flexure strength of a concrete sample.
16. The student will identify and apply the direct stress formula.
17. The student will differentiate between post tensioning and pretensioned concrete units.
18. The student will perform the sieve test for concrete aggregates.
19. The student will identify the ball penetration test.
20. The student will identify the air content test.
21. The student will identify a lean concrete mix.
22. The student will identify concrete bleeding.
23. The student will identify plasticity.
24. The student will identify and outline the use of three concrete additives.
25. The student shall explain air-entrained concrete.
26. The student will outline the proper methods of placing and curing concrete.

Unit 3 - Wood

1. The student shall list nine advantages of wood as a construction material.
2. The student shall list four disadvantages of wood as a construction material.
3. The student shall identify the structure of wood.
4. The student shall identify the various classifications of trees.
5. The student shall relate the properties and the uses of ten common trees.
6. The student shall determine the moisture content of a wood sample.
7. The student shall explain two methods of seasoning wood.
8. The student shall identify and outline as least two common wood diseases.
9. The student shall list five categories for dimension lumber.
10. The student shall determine the effects of chemical treatment on wood strength.
11. The student shall identify edge grain and flat grain.

Unit 5 - Brick, Tile & Stone

1. The student shall identify and explain the use of a bond beam.
2. The student shall identify and describe cellular concrete.
3. The student shall identify and describe cement-lime mortar.
4. The student shall identify and draw a lintel.
5. The student shall be able to define:
 - a) pilaster
 - b) slurry
 - c) water retentivity
6. The student shall be able to outline the A.S.T.M. specifications with regard to:
 - a) compressive strength of load-bearing concrete blocks
 - b) allowable absorption rate of load-bearing blocks
 - c) moisture content of blocks.
7. The student shall describe the difference between face-shell and full mortar bedding of blocks.
8. The student shall explain why good water retentivity of mortar used in laying blocks is important.
9. The student shall be able to list five factors basic to the construction of a good quality block wall.
10. The student shall identify and describe the National Building Code requirements for lateral support, thickness and height of masonry walls.
11. The student shall be able to outline the history of the manufacture of brick and tile.
12. The student shall identify the various types of clay used in brick and tile manufacturing processes.
13. The student shall describe the six phases in the manufacture of brick.
14. The student shall identify and know the structural dimensions of at least five types of brick.
15. The student shall describe the properties of at least four types of masonry mortar.
16. The student shall draw six types of mortar joints.
17. The student shall be able to differentiate between the various types of clay tile and know their uses in construction.
18. The student shall test a brick or tile sample for flexure strength and compressive strength.

V. EVALUATION METHODS: (INCLUDES ASSIGNMENTS, ATTENDANCE REQUIREMENTS, ETC.)

A final grade will be derived as follows:

Laboratory work	25%
SEMINAR	15%
Three Term Tests of equal weight	60%
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	100%

The grading system used will be as follows:

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

1. Minimum acceptable grade for this course is 55%.
2. Each laboratory will carry equal weight. Late submissions will be penalized with a loss of 20% for the first day late and an additional 10% for each subsequent late day.
3. If at the end of the semester the overall mark of the combined laboratory work, project and tests is below 55%, then it will be up to the instructor whether or not a rewrite test will be granted. The criteria employed for arriving at that decision is class attendance, class participation and overall grade, which should be at least 45%.

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VIII. SPECIAL NOTES

Students with special needs (eg. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.

IX. COURSE ANALYSIS SHEET (see instructor)

Design
Mater. &
Const.
Test &
Spec.

Accord
to
code

Broad
area

Assessment Process

- Register at the PLA office
- Pay \$55.00 at the registrar's office
- Retain receipt
- Schedule laboratory testing
- Prepare portfolio
- Prepare and write challenge examination
- Evaluation

Assessment Tools

- Challenge examination
- Laboratory equipment

Supports

- ASTM laboratory testing procedures
- Orientation to laboratory facility by technologist or professor.

Requirements for Successful Completion of Course

- Minimum of 60% on each of the Challenge examination, laboratory testing and portfolio component.

A challenge process for this course can be made available to learners within a reasonable period of time following a learner's request.

Signatures:

Professor

Program Coordinator or Dean

Date