

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** CONSTRUCTION MATERIALS

**CODE NO. :** CON 100                      **SEMESTER:** II

**PROGRAM:** CIVIL/CONSTRUCTION ENGINEERING TECHNICIAN

**AUTHOR:** S. IENCO

**DATE:** Jan-07                      **PREVIOUS OUTLINE DATED:** Dec-05

**APPROVED:**

	_____	_____
	DEAN	DATE

**TOTAL CREDITS:** 4

**PREREQUISITE(S):** NONE

**LENGTH OF COURSE:** 16 WEEKS                      **TOTAL CREDIT HOURS:** 64

**Copyright ©2003 The Sault College of Applied Arts & Technology**  
*Reproduction of this document by any means, in whole or in part, without prior written permission of Sault College of Applied Arts & Technology is prohibited.*  
*For additional information, please contact C. Kirkwood, Dean*  
*School of Technology, Skilled Trades, Natural Resources, Computer Studies &*  
*Business*  
*(705) 759-2554, Ext.2688*

## **I. COURSE DESCRIPTION:**

You will be introduced to various construction materials such as aggregates, asphalt concrete and Portland cement concrete. Understanding of the physical and engineering properties of these materials is accomplished by way of lectures, laboratory testing and field trips.

Throughout this course, students will adhere to the applicable Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

### Course outline amendments:

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

## **II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

Upon successful completion of this course, the student will demonstrate the ability to:

1. List the types of soil and rock deposits used for aggregates in Ontario and in local areas, and estimate types and potential quantities of material contained in a deposit.

### Potential Elements of the Performance:

- State, define and describe the origin, formation, sources and properties of aggregates
- Describe typical aggregate bearing landforms.
- Identify current applicable standards pertaining to aggregate properties for various construction uses.

2. Identify standards for sampling and testing aggregates and perform aggregate tests.

### Potential Elements of the Performance:

- Describe the procedures for extracting representative samples of aggregates from conveyors, stockpiles, trucks, barges, bins and pit faces in accordance to recommended practices and using common sampling techniques.
- Determine the size of sample required for any test to be performed on the aggregate.

Potential Elements of the Performance Continued:

- Perform standard tests such as sieve analysis, grain size distribution, wash test, relative density and absorption (coarse aggregate), relative density and absorption (fine aggregate) and soundness test.
  - Assess test results, perform calculations and prepare laboratory reports.
3. Participate in the testing of asphalt concrete mixes using the Marshall method and industrial standards and specifications. Report the results of wear and tear on five to ten year old asphalt pavement.

Potential Elements of the Performance:

- Identify the types and uses of asphalt cements.
  - Identify required asphalt cement tests.
  - Participate in observing and recording laboratory sample split test.
  - Participate in the testing of briquettes.
  - Participate in testing asphalt for air content, density and stability.
  - Perform an inspection of causes and repair of cracks, distortions, disintegration and slippery surfaces for an asphalt pavement.
4. Design and test Portland cement concrete mixes to satisfy design criteria such as water/cement ratio, aggregate blending, admixture selection and trial batch procedures.

Potential Elements of the Performance:

- Describe the manufacture of Portland cements, the types produced and their uses in construction.
- Describe Portland cement concrete including materials used, the hydration process, water/cement ratio, curing requirements, workability, air content, admixtures and criteria used to measure properties.
- Recognize methods used to improve durability of Portland cement concrete when exposed to freeze/thaw cycles, road deicing chemicals and other destructive environments.
- Prepare a Portland cement concrete mix, sample and test for slump, air content and density.
- Cast fresh concrete cylinders.
- Complete compression testing of standard cured concrete including capping, breaking, recording, plotting and evaluating results.

Potential Elements of the Performance Continued:

- Describe practices used in the mixing, transportation, placing and finishing concrete on construction projects.
5. Conduct yourself and perform all laboratory work in a safe and responsible manner in accordance with the “Occupational Health and Safety Act and Regulations for Construction Projects.”

Potential Elements of the Performance:

- Understand the history and development of Health and Safety Law
- Record the rights and responsibilities of workers
- Illustrate the ten part of the Occupational Health and Safety Act
- Apply the occupational health and safety regulations
- Apply the workplace hazardous materials information system

**III. TOPICS:**

1. Aggregate Sources
2. Aggregate Sampling and Testing
3. Asphalt Concrete
4. Portland Cement Concrete
5. Occupational Health and Safety Act and Regulations for Construction Projects

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

**Highway Materials, Soils, and Concretes**

Latest Edition  
Harold Atkins

**V. EVALUATION PROCESS/GRADING SYSTEM:**

You will be assigned a final grade based on successful completion of laboratories, assignments and tests, weighted as follows:

Laboratories/Assignments	20%
Quizzes	10%
Projects	10%
Two tests of equal weight	<u>60%</u>
<b>TOTAL</b>	<b>100%</b>

Each laboratory/assignment carries equal weight. Late submittals receive only a maximum grade of 50%. However, laboratories handed in later than one week will receive a grade of 0%.

Quizzes are given on a surprise basis at the beginning of a lecture. The content of each quiz is relevant to one or two week's stretch of lectures. You are not permitted to write a missed quiz unless you present the instructor with a written letter explaining the extenuating circumstance why you were unable to write the quiz.

Each project carries equal weight. Late submittals receive only a maximum grade of 50%. However, laboratories handed in later than one week will receive a grade of 0%.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	4.00
B	70 - 79%	3.00
C	60 - 69%	2.00
D	50 – 59%	1.00
F (Fail)	49% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
U	Unsatisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course.	
NR	Grade not reported to Registrar's office.	
W	Student has withdrawn from the course without academic penalty.	

**VI. SPECIAL NOTES:**

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

## **VII. ACADEMIC / CLASSROOM CONDUCT**

Introduction: Sault College students, faculty members, employees and Ray Lawson Hall Residents constitute an academic community committed to training and education that will enhance effectiveness in the workplace and quality of life. The College community expects all members to discipline themselves, individually and collectively, and it requires adherence to the standards of conduct appropriate for an academic community.

Sault College considers its students adults and as such obligated to make responsible decisions. The Student Code of Conduct exists to assist in the effort of providing the best possible learning and living environment for all students. It is the obligation of students to treat all other members of the academic community with dignity and respect – including other students, faculty members, employees, visitors and neighbours of the College. The enforcement of the Student Code of Conduct is critical to the existence of such an environment for all members of the academic community. Ignorance of the rules or of the law is not a defence against disciplinary action. The College reserves all rights to criminal action where it deems necessary. Lack of intention to violate College policy will not generally excuse an infraction.

### Academic Dishonesty:

Students shall submit written or other work in a course that shall be the product of their own efforts. "Academic Dishonesty" includes, but is not limited to, the following:

- a. Copying from another student's paper.
- b. Using material not authorized by the person administering the test or assignment.
- c. Collaborating with another student during a test without permission.
- d. Plagiarism (i.e. representing the work of another, as one's own, inclusive of purchases of a commercial nature).
- e. Collusion (i.e. obtaining from or giving to another student unauthorized assistance in course work).
- f. Falsification (i.e. modification, without authorization, of any examination paper, record, assignment, or report).
- g. Knowingly using, buying, selling, stealing, or soliciting contents of a test, examination paper, record, assignment, or report.

Academic Dishonesty Continued:

- h. Representing oneself as another student for the purpose of taking a test or examination or allowing oneself to be represented by another for the same
- i. Attempting to bribe or otherwise coerce a professor/instructor to obtain favours.
- j. Cheating (i.e. any misrepresentation by a student of their performance in a College subject for the purpose of obtaining credit to which they are not entitled).
- k. Any act designated by the President or his/her designate.

(Student Code of Conduct – Article 2, Section 2)

Attendance:

Students are expected to attend 100% of their classes. Attendance will be recorded within the first 15 minutes of each class.

Leaving or Entering During Class:

Students should exercise respect for faculty and students when leaving or entering a class that is already in session. Leaving or entering should be done with a minimal amount of interruption.

Disruption:

Students shall not obstruct or disrupt, or attempt to obstruct or disrupt, teaching, administration, disciplinary procedures, or other College activities.

(Student Code of Conduct – Article 2, Section 9)

Use of Electronic Devices:

*General:* Taking photos or making audio/video recordings on Sault College property without permission in ANY context in which the person being photographed or recorded has a reasonable expectation of privacy is prohibited. Examples include but are not limited to:

*Classrooms:* The use of cell phones, photographically capable cell phones, pagers and other communication/electronic devices during classes, clinical or field placement is prohibited unless authorized by faculty.



Use of Electronic Devices Continued:

*Examinations:* The use of cell phones, photographically capable cell phones, pagers and other communication/electronic devices during exams and midterms is prohibited unless authorized by faculty in charge.

(Student Code of Conduct – Article 2, Section 31)

**SANCTIONS**

College staff may impose sanctions in accordance with their responsibilities. Sanctions, which are imposed, may become part of the student's official record and are removed one year and one term after the student's last academic activity at Sault College.

The College shall make sanctions concerning students' actions and offences occurring within or affecting people on Sault College owned or controlled property, including but not limited to Ray Lawson Hall Residence, Sault College Aviation Hangar, off-campus at a College-sponsored event, or when such actions or offences at a non-College event off-campus have a direct impact on students' on-campus. The College reserves the right to assess any sanction it may deem appropriate. A serious breach or continuation or a repetition of behaviour in violation of the Student Code of Conduct will be cause for further sanctions up to and including expulsion.

**Sanctions for Academic Dishonesty may include the following:**

1. A professor/instructor may assign a sanction as defined below, or make recommendations to the Dean for disposition of the matter. The professor/instructor may:
  - issue a verbal reprimand
  - make an assignment of a lower grade with explanation
  - require additional Academic assignments and issue a lower grade upon completion, to the maximum grade "C"
  - make an automatic assignment of a failing grade
  - recommend to the Dean, dismissal from the course with the assignment of a failing grade recommend to the Dean, dismissal from the College for a definite or indefinite period of time with a failing grade.

**Sanctions for Academic Dishonesty may include the following Continued:**

2. If the student denies the allegation of academic dishonesty the student should discuss the matter with the Director of Student Services immediately. If the matter cannot be resolved the student should file an Academic Appeal within three (3) working days. The appeal would automatically move to Step Two – Academic Appeal.  
(Student Code of Conduct – Article 4)

**Testing Absence**

If a student is unable to write a test for medical reasons on the date assigned, the following procedure is required:

- In the event of an emergency on the day of a test, the student must telephone the College to identify the absence. The college has a 24-hour electronic voice mail system (759-2554) Ext. 2600. Documentation may be required to support the absence.
- The student shall provide the Professor with advance notice preferably in writing or e-mail of his/her need to miss the test.
- The student may be required to document the absence at the discretion of the Professor.
- All decisions regarding whether tests shall be re-scheduled will be at the discretion of the Professor.
- The student is responsible to make arrangements, immediately upon their return to the College with their course Professor in order to make-up the missed test prior to the next scheduled class for the course in question.

**VIII. PRIOR LEARNING ASSESSMENT:**

Students who wish to apply for advanced credit in the course should consult with the professor and the college's academic counsellors. Credit for prior learning will be given upon successful completion of a challenge exam or portfolio.

**IX. DIRECT CREDIT TRANSFERS:**

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.