

SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY

SAULT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: APPLIED MECHANICS (STATICS)

CODE NO.: ENCH 100

SEMESTER: TWO

PROGRAM: Civil and Architectural Engineering Technician/Technology

AUTHOR: G. Disano

DATE: January 1995 . PREVIOUS OUTLINE DATED: August 1991

(Text book change)

APPROVED: *J.P. Crockett*
DEAN

95-01-05
DATE



APPLIED MECHANICS (STATICS)
COURSE NAME

MCH 100
CODE NO.

TOTAL CREDITS Four

PREREQUISITE(S): None

I. PHILOSOPHY/GOALS: The objective of this course is to introduce the student to a number of fundamental concepts of statics which should prove useful to the civil and architectural student.

Every effort will be made not to dwell on the theory of these concepts but to instead stress practical applications through the extensive use of problem solving.

II. STUDENT PERFORMANCE OBJECTIVES (OUTCOMES):

Upon successful completion of this course the student will:

- 1) solve problems involving forces, resultants, moments and couples;
- 2) solve problems involving centroids and centres of gravity;
- 3) solve problems using free body diagrams & equations of equilibrium;
- 4) analyze trusses & frames by the method of sections & method of joint
- 5) solve problems involving static and kinetic friction.

III. TOPICS TO BE COVERED:

**Approximate Time
Frames (Optional)**

- 1) MATHEMATICS OF MECHANICS
- 2) FORCE SYSTEMS
- 3) MOMENTS
- 4) NONCONCURRENT-COPLANAR FORCES; TRUSSES
- 5) CONCURRENT-NONCOPLANAR FORCES
- 6) STATIC AND KINETIC FRICTION
- 7) CENTRE OF GRAVITY AND CENTROIDS

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

See attached sheet titled: "GRADE REQUIREMENTS"
(page 6)

VI. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

VII. REQUIRED STUDENT RESOURCES

Bassin, Brodsky and Wolkoff, STATICS AND STRENGTH OF MATERIALS, Fourth edition. McGraw-Hill Book Company. Toronto. 1988.
ISBN 0-07-004023-0

VIII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY:

Book Section

You will find the college's collection of applied mechanics books on the second floor of the college library. They are located on the shelves under the call number TA.

Periodical Section

Audiovisual Section

IX. 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.

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Suggested Text: STATICS AND STRENGTH OF MATERIALS
by Bassin, Brodsky and Wolkoff

TOPIC NO.	PERIODS	TOPIC DESCRIPTION	REFERENCE
I		<u>Mathematics of Mechanics</u> a) introduction to mechanics b) basic terms c) 'vector' and 'scalar' quantities d) numerical accuracy e) rounding off numbers f) dimensional analysis	Chapter 1 Appendix A-1
II		<u>Force Systems</u> a) types of force systems b) resultant of 'concurrent' forces c) resultant of 'collinear' forces d) equilibrium of 'concurrent' forces e) equilibrium of 'collinear' forces f) 'action' and 'reaction' forces g) tension and compression forces h) resultant of two concurrent forces i) three forces in equilibrium - the triangle of forces j) principle of concurrence k) "free-body" diagrams l) simple structures using 'pinned joints' m) rectangular components of a force n) resultant of forces in a plane o) equilibrium of forces in a plane p) resultant of concurrent forces by summation	Chapter 2 Appendix A-2 Appendix A-3
III		<u>Moments</u> a) moments and torques b) sign of moments c) equilibrium of parallel forces d) uniformly distributed loads e) couples	Chapter 3

Continued

IV	<u>Nonconcurrent-Coplanar Forces; Trusses</u>	
	a) resultant of nonconcurrent-coplanar forces	Chapter 4 Appendix A-4
	b) general method	Appendix A-5
	c) graphical method	Appendix A-6
	d) applications	
	e) trusses	
	f) the method of joints	
	g) the method of sections	
V	<u>Concurrent-Noncoplanar Forces</u>	Chapter 5
	a) resultant of concurrent-noncoplanar forces	
	b) conditions for equilibrium	
VI	<u>Static and Kinetic Friction</u>	Chapter 6
	a) maximum static friction	
	b) friction on an inclined plane	
	c) 'least' force	
VII	<u>Centre of Gravity and Centroids</u>	Chapter 10
	a) centre of gravity of a body	
	b) centre of gravity of an area-centroids	
	c) moment of an area	
	d) centroids of composite areas	
	e) centre of gravity of simple and composite solids	

GRADE REQUIREMENTS

MCH 100

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Your final grade in MCH100 will be determined on the basis of four tests to be administered during the semester. Each test will examine your knowledge of a number of topics and will be administered within one week of completing those topics. The topics covered in each of the four tests are as follows:

- Test #1 ---- Topic Number I
 Topic Number II
- Test #2 ---- Topic Number III
 Topic Number IV
- Test #3 ---- Topic Number V
 Topic Number VI
- Test #4 ---- Topic Number VII

The four tests are of equal weight (i.e. each of the four tests is worth 25% of your final grade). As a result, provided you have received a passing grade on each of the unit tests, your final grade will simply be an average of your four test results. In order to obtain your letter grade the following percentage-letter grade equivalents will be used:

- A⁺ : 90% - 100% (Consistently outstanding achievement)
- A : 80% - 89% (Outstanding achievement)
- B : 66% - 79% (Consistently above average achievement)
- C : 55% - 65% (Satisfactory or acceptable achievement)
- X or R : 0% - 54% (Incomplete or Repeat)

If your final average is below 55%, or if you have received a failing grade in one or more of the unit tests, whether you receive an 'X' (Incomplete) or an 'R' (Repeat) grade is entirely at the instructor's discretion. The decision will be based upon your final average (e.g. 32% would result in an R grade while 50% might result in an X grade); your attendance during the semester; your attitude while in the classroom; your perceived level of effort during the semester; etc..

In any case, should you find yourself with an X grade at the end of the semester, in order to upgrade your mark to a passing grade you will be required to write a make-up examination covering the entire course content! Should you receive a passing grade on the make-up examination (55% or higher) your X grade will be upgraded. The best you can do after having received an X grade as a result of a failing average is a C! If you were required to write the make-up examination as a result of having failed one test you may substitute the exam result for this test result.

Prior to administering any test you will be notified a full week in advance. Should you, for any reason, not be able to be in attendance on a day for which a test has been scheduled it is your responsibility to notify the instructor prior to the test! If your reasons are acceptable, a date will be set during which you may write a substitute test for the one you have missed.