

DAWSON COLLEGE
MATHEMATICS DEPARTMENT
201-105-DW
LINEAR ALGEBRA
STUDY GUIDE
PONDÉRATION: 3-2-3

Prerequisite: High school or CEGEP Functions. Note, however, that the majority of the students who take this course have already passed Calculus I and Calculus II so they exhibit a fair degree of mathematical maturity.

Text: Elementary Linear Algebra (Abridged Version) 9th Ed., by H. ANTON.

References:

- 1) Linear Algebra with Applications, by W.K. NICHOLSON.
- 2) Linear Algebra, by S. GROSSMAN.

Additional Sources:

- 1) Elementary Linear Algebra, by R.M. McKENZIE.
- 2) Problem Assignments, by S. PHULL.
- 3) Linear Algebra Problem Sets Plus, by I. GOMBOS.

Methodology: Lectures and problems sessions.

Term work: The term grade is based on a minimum of 4½ hours of tests/quizzes. A minimum of 3 class tests will be given.

Grading Policy: The student's grade shall consist of:

- (a) Term work for 50% and Final Exam for 50%

OR

- (b) Final Exam for 100%.

To qualify for (b), the student must have obtained at least 50% on term work and have written more than 50% of the class tests.

Calculators: A calculator without text storage or graphing capabilities is allowed, for class tests and the Final Exam.

Cheating in Examinations, Tests, and Quizzes

Cheating includes any dishonest or deceptive practice relative to formal final examinations, in-class tests, or quizzes. Such cheating is discoverable during or after the exercise in the evaluation process by the instructor. Such cheating includes, but is not limited to

- a. copying or attempting to copy another's work.
- b. obtaining or attempting to obtain unauthorized assistance of any kind.
- c. providing or attempting to provide unauthorized assistance of any kind.
- d. using or possessing any unauthorized material or instruments, which can be used as information storage and retrieval devices.
- e. taking an examination, test, or quiz for someone else.
- f. having someone take an examination, test, or quiz in one's place.

Unauthorized Communication

Unauthorized communication of any kind during an examination, test, or quiz is forbidden and subject to the same penalties as cheating.

Plagiarism on Assignments and the Comprehensive Assessment

Plagiarism is the presentation or submission by a student of another person's assignments or Comprehensive Assessment as his or her own. Students who permit their work to be copied are considered as guilty as the plagiarizer is.

Obligation of the Teacher

Every instance of cheating or plagiarism leading to a resolution that impacts on a student's grade must be reported by the teacher, with explanation, in writing to the Chair of Mathematics and to the Dean of Pre-University Studies. A copy of this report must also be given to the student.

Penalties

Cheating and plagiarism are considered extremely serious academic offences.

Action in response to an incident of cheating and plagiarism is within the authority of the teacher. Penalties may range from zero on a test, to failure of the course, to suspension or expulsion from the college.

Literacy Policy:

Problem-solving is an essential component of this course. Students will be expected to analyze problems stated in words, to present their solutions logically and coherently, and to display their answers in a form corresponding to the statement of the problem, including appropriate units of measurement. Marks will be deducted for work, which is inadequate in these respects, even though the answers may be numerically correct.

Religious Holidays:

Students who wish to observe religious holidays must inform each of their teachers in writing within the first two weeks of each semester of their intent to observe the holiday so that alternative arrangements convenient to both the student and the teacher can be made at the earliest opportunity. The written notice must be given even when the exact date of the holiday is not known until later. Students who make such arrangements will not be required to attend classes or take examinations on the designated days, nor be penalized for their absence.

It must be emphasized, however, that this College policy should not be interpreted to mean that a student can receive credit for work not performed. It is the student's responsibility to fulfill the requirements of the alternative arrangement.

TOPICS

SPECIFIC COMPETENCY

LEARNING ACTIVITIES

(Time in weeks)

(*indicates the topic is not covered in the text)
(**indicates a theoretical problem)

(*indicates the topic is not covered in the text)

Systems of linear Equations

Solving systems of linear equations
Properties of matrices and matrix operations
Definition of matrix inverse
Properties of elementary matrices, finding inverse matrices
Theorems on invertibility and solutions of systems
Diagonal, triangular and symmetric matrices

1.1 (1-11); 1.2 (1-10, 17, 22)
1.3 (1-8, 12-14)
1.4 (1-8, 14**, 17**, 20-22, 29, 31**, 32**, 35**, 36**) **4**
1.5 (1-7, 9-12)
1.6 (1, 3, 4, 8, 9, 11, 12, 16-19, 21)
1.7 (1-9, 15, 16a**, 18**, 22**, 23**, 30**) **4**
Supp. Ex. (6, 7, 9, 11, 14**)

The determinant function

Cofactor expansions; the adjoint matrix; Cramer's Rule
Evaluating determinants by row reduction
Properties of determinants
Properties of determinant function

2.1 (1-14, 16-19, 21) **3**
2.2 (1-14, 19, 20)
2.3 (1-7, 12**, 16**, 18**, 20**, 21**, 22(a, b)**, 23d**) **3**
2.4 (1-13, 18)
Supp. Ex. (3, 12, 13)

Vectors

The definition of a vector, component notation for a vector
Norm of a vector, vector arithmetic
The dot product: vector projections and applications
The Cross Product and its properties and applications,
The Scalar Triple Product and its applications
Lines and Planes in Space

- point-normal and general forms for the equation of a plane
- symmetric, parametric & vector equations for a line
- calculations of distance: from a point to a plane, from a point to a line
- intersection problems: between a line and a plane, between 2 lines

3.1 (1-6) **4**
3.2 (1-9)
3.3 (1-17, 18**, 27, 29)
3.4 (1-19, 21)
3.5 (1-43)

Applications

Any two of the following topics

Linear Programming
Networks (Traffic Flow), The Leontief Input-Output Model

(Supplementary Notes)
(Supplementary problems)

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Dawson College

Department of Mathematics

Course Outline for Linear Algebra (201-105-DW) Section 04, Winter 2009

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Evaluation

The student's grade shall consist of:

- a) Term work for %50 and Final Exam for %50
- OR
- b) Final Exam for 100%

To qualify for b), the student must have obtained at least 50% on term work and have written more than 50% of the class tests.

Term work will consist of:

- Three tests worth a total of %40 and held on February 18, April 1 and May 6.
- In class quizzes worth a total of %10 written on each Wednesday (except test days) starting January 28 and ending April 29.

Student Responsibilities

1. Regular attendance. Tardiness will not be tolerated.
2. Cell phone interruptions will not be tolerated. Cell phones must be turned off for the duration of the class.
3. As a rule, a medical note is required to avoid a penalty for missed tests. An unexplained absence will result in a grade of zero.
4. Students have an obligation to inform themselves about Dawson's policy on cheating and plagiarism