LINEAR ALGEBRA in Spring 2021 (MA2041)

Course Code	MA2041	**Professor(s)**	Alexandra Svoronou
Prerequisites	None	**Office Number**	PL1st floor
Class Schedule	M: 12:10-13:30 in PL-4 R: 16:55-18:15 in G-L21	**Office Hours**	Mo: 3-4:30pm
Credits	4	**Email**	asvoronou@aup.edu
Semester	Spring 2021	**Office Tel. Ext.**	650

Course Description

This course treats applications in economics and finance, limited to Euclidean n space.

Course Learning Outcomes

Students will be able to perform vector and elementary matrix operations over the field of real numbers, including solving systems of linear equations.
Students will be able to compute eigenvalues and eigenvectors in order to diagonalise a matrix.
Students will be able to apply the concepts and techniques of Linear Algebra to problems across other disciplines.

General Education

Course Outline

This course treats applications in economics and finance, limited to Euclidean n space.

Topics include:

Introduction: what is linear algebra?

Vectors: Definition. Row and column vectors. Dimension. Operations on vectors: addition, scalar multiplication, transposition. Dot product. Norm of a vector.

Planes Equation of a plane. Normal vector. Shortest distance of a plane from the origin

Matrices: Definitions. Null matrix. Identity matrix. Operations on matrices: addition, scalar multiplication, transposition. Matrix multiplication: rules and examples. Matrix algebra. Inverse of a matrix. Inversion of n x n matrices.

Systems of linear equations: What is a linear equation? Linear systems with 2 unknowns. Linear systems with more than 2 unknowns: general approach. Matrix of a linear system. Rank of a system: notion of linear independency. Gauss-Jordan method. v Back to matrices: Determinant and its Applications. Cross product. Transformations. Rotation matrices. Applications in Regression, cryptography, Leontief input-output matrix problem steady-state problems, network problems, portofolio optimization.

Spectral theory: Eigenvectors and eigenvalues. Diagonalisation of a matrix. Spectrum theorem. Applications.

Textbooks

This course doesn't have any textbook.

Attendance Policy

Students studying at The American University of Paris are expected to attend ALL scheduled classes, and in case of absence, should contact their professors to explain the situation. It is the student’s responsibility to be aware of any specific attendance policy that a faculty member might have set in the course syllabus. The French Department, for example, has its own attendance policy, and students are responsible for compliance. Academic Affairs will excuse an absence for students’ participation in study trips related to their courses.

Attendance at all exams is mandatory.

IN ALL CASES OF MISSED COURSE MEETINGS, THE RESPONSIBILITY FOR COMMUNICATION WITH THE PROFESSOR, AND FOR ARRANGING TO MAKE UP MISSED WORK, RESTS SOLELY WITH THE STUDENT.

Whether an absence is excused or not is ALWAYS up to the discretion of the professor or the

department. In this course**, 4 unexcused absences ca**n result in a **low or failing participation grade**. In the case of excessive absences, it is up to the professor or the department to decide if the student will receive an “F” for the course. An instructor may recommend that a student withdraw, if absences have made it impossible to continue in the course at a satisfactory level.

Students must be mindful of this policy when making their travel arrangements, and especially during the Drop/Add and Exam Periods.

Grading Policy

Assignments: 15% Quizzes: 35% Final exam: 40% Participation: 10%

70-79 -> C

80-89 -> B

90-95 -> A-

96-100 -> A

I shall give you HW almost at every session and we shall work on them on the next class. This

will count on your participation.

You will be grated for ‘*assignments*’ on the assignments I shall give you at the end of each topic.

Other

On AUP blackboard you will be able to find notes from the course. Please do write your own notes as well.

You are more than welcome to come to my office hours. You can find me after class (4-6pm) in SDo room 8