

UE10 Algebra refresher

Course title - Intitulé du cours	UE10 Algebra refresher
Level / Semester - Niveau /semestre	M1 / S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	BLANCHET ADRIEN
Other teacher(s) - Autre(s) enseignant(s)	
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Other teacher(s) - Autre(s) enseignant(s)	
Lecture Hours - Volume Horaire CM	15
TA Hours - Volume horaire TD	
TP Hours - Volume horaire TP	0
Course Language - Langue du cours	Anglais
TA and/or TP Language - Langue des TD et/ou TP	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

email: Adrien.Blanchet@ut-capitole.fr

office: MF213

office hours: On Tuesday 2 PM - 3:30

Course's Objectives - Objectifs du cours :

This Algebra refresher course is dedicated to an overview of all the notions of Algebra which are requested to attend the Master in TSE. These notions are supposed to be known by the students. The lectures will consist in a quick reminder with only a few proof rather than a proper lecture. References to classical books will be provided during the lectures. Exercises will be provided to the students together with a few corrections in order to review the different methods which will be used in the sequel of the year.

Chapter 1: vector spaces

sub-vector spaces, basis, change of basis, kernel, image, rank-nullity theorem, linear applications with applications to the resolution of linear systems

Chapter 2: reduction of endomorphism

determinant, diagonalisation, Jordan's trigonalisation, Cayley-Hamilton's theorem, application to the power and exponential of a matrix

Chapter 3: Euclidean spaces

quadratic form, Gauss' reduction, scalar product, Cauchy-Schwarz inequality, orthogonal basis, orthogonal group

Chapter 4: Projection

projection on a sub-vector space, orthogonal projection, distance to a sub-vector space, separation theorem

Prerequisites - Pré requis :

All the notions stated above.

Practical information about the sessions - Modalités pratiques de gestion du cours :

No laptop, no tablets, no phone.

The students are supposed to be on time and to come regularly.

The above outline is the planned lecture but it can easily be changed to fit the students' requests. This will be discussed in class

Grading system - Modalités d'évaluation :

No grade.

Bibliography/references - Bibliographie/références :

Any lecture of linear algebra.