Mathematics of Machine and Deep Learning

Course title - Intitulé du cours	Mathematics of Machine and Deep Learning
Level / Semester - Niveau /semestre	M2/S1
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Raphaël Sourty
Lecture Hours - Volume Horaire CM	7.30
Course Language - Langue du cours	Anglais

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

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Course Objectives - Objectifs du cours :

The goal of this course is to give a hands-on introduction to deep learning for students who know the basics of machine learning. The course will briefly cover basic machine learning concepts and will mostly focus on why and how deep learning can be put into practice. NLP (Natural Language Processing) will be used as a background example throughout the course. A chapter of the course will be dedicated to the state of the art in NLP. We will make a brief introduction to the ethics and dangers of AI based on the book "Artificial Intelligence: A Modern Approach, 4th Edition" by Peter Norvig and Stuart Russel. At the end of the course, students should be able to understand the basics of how to design, develop and evaluate a deep learning methodology and should have the knowledge to be able to go further by themselves.

Prerequisites – Pré requis :

A bit of practice in programming and in machine learning would help.

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

Laptops are accepted and even encouraged. Students can participate freely asking questions whenever they want either in French or in English. Students with more than ten minutes late won't be accepted in the course.

Grading system - Modalités d'évaluation:

Final exam as an open-source project.

Bibliography/references - Bibliographie/références :

The list of material will be available from the Moodle page and regularly updated.

Distance learning – Enseignement à distance :

Distance learning can be provided when necessary by implementing, for example: / En cas de nécessité, un enseignement à distance sera assuré en mobilisant, par exemple :

- ⍰ Interactive virtual classrooms / Classe en ligne interactive

- ⍰ Recorded lectures (videos) / Vidéo enregistrée de la présentation du matériel pédagogique

- ⍰ MCQ tests and other online exercises and assignments / QCM et exercices en ligne

- ⍰ Remote (online) tutorials (classes) / TP/TD à distance

- ⍰ Chatrooms / Forums