Database / Bases de données

Course title - Intitulé du cours	Database
Level / Semester - Niveau /semestre	M2 / S2
School - Composante	Ecole d'Economie de Toulouse
Teacher - Enseignant responsable	Ronan TOURNIER (Database)
Lecture Hours - Volume Horaire CM	21-mixed
TA Hours - Volume horaire TD	Mixed
TP Hours - Volume horaire TP	Mixed
Course Language - Langue du cours	English
TA and/or TP Language - Langue des TD et/ou TP	English

Teaching staff contacts - Coordonnées de l'équipe pédagogique :

Ronan Tournier, office MQ201 – AR 367, (ronan.tournier@ut-capitole.fr). You may request an appointment by mail. However, online communication should be preferred (either the Moodle discussion forum for course questions or the mail for administrative enquiries).

Course's Objectives - Objectifs du cours :

The objective of the course, done in conjunction with Web mining is to learn how to perform data analysis setting up a process chain that extracts data from a database. Students will learn how relational database work and how data is stored inside. They will then learn how to perform more and more complex queries allowing more complex analyses. They will also learn how to access such databases using a programing language (Python). Databases used will represent two extremes: one of the most efficient database management system (Oracle) as well as a very light one (SQLite).

The end of the course is dedicated to a presentation of what is the big picture of big data from a computer science point of view. This part will detail how computers can cope with big data using some very specific software that can complement databases.

Software used are: Oracle Database, Python and SQLite.

Prerequisites - Pré requis :

- A basic knowledge of python and how to use it on the university computers or on your personnal computer is highly recommended.

- if students want to use Jupyter notebooks, knowledge on how to correctly present data in them is mandatory.

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

Courses will use videos and sessions will be dedicated to discussions and practical work. Some sessions may be distance learning using virtual classrooms. Frequent multiple choice question tests will be available in order to ease course knowledge retention.

Sessions in class having at least read what was done in the previous course.

Laptop computers are allowed in class but will not be used all the time as some software server might not be compatible with student laptops.

Grading system - Modalités d'évaluation :

Several posittioning MCQ (multiple choice question) tests will be provided on the Moodle platform. Their usage and progression in the answers which is the goal of these positioning tests, will be monitored and taken into account in the following grade:

Grades are based on a project done in pairs. The project generally consists in the analysis of a dataset. This dataset if generally the same as in the Web Mining part of the course.

Bibliography/references - Bibliographie/références :

The course does not follow an existing book, however, the following references may help :

- SQL for dummies, Allen G. Taylor, Wiley, 2013—8th edition.

Or any book for SQL querying on a database.

Session planning - Planification des séances :

The course is composed of 8 sessions located in a computer room. They will follow the following layout and some points will span over several sessions.

- Introduction to relational databases and Oracle Database.

- Creating a database : SQL data cdefinition language.

- Adding data to a database : SQL data manipulation language.

- Analysing data : SQL data query language.

- Accessing a database from a programming language: Python and SQLite.

- Big Data from a computer science perspective (how do you really do big data).

Course resources and planning will be available on the Moodle platform.

Distance learning – Enseignement à distance :

Distance learning can be provided when necessary by implementing, for example: virtual classrooms for interaction between students and the teacher, online tutorials using the university computers from a remote access.

All lectures will be preceded by videos followed by MCQ tests for easing knowledge retention. Sessions will be focused on discussions and questions on difficult parts.

Throughout the year, forums will be used for course discussions and when necessary specific chats will be opened.