Catalogue de cours
Course Catalogue

2025-2026

UNIVERSITÉ TOULOUSE CAPITOLE

FACULTÉ D'INFORMATIQUE

Membre de l'Université Toulouse Capitole

Semester 1

- 5 ECTS
- CM-TD : 36h

Advanced Databases

- 5 ECTS
- CM : 18h
- TD : 27h

Bases de données relationnelles

- 5 ECTS
- CM-TD : 36h

Data Analysis and Visualisation

- 6 ECTS
- CM-TD : 45h
- Project Week

Innovative Software Methods

- 6 ECTS
- CM-TD 45h
- Project Week

Internet of Things

- 5 ECTS
- CM-TD : 36h

Object Oriented Programming

- 5 ECTS
- CM-TD : 36h

Project Management

- 2 ECTS
- CM-TD : 15h

Research Workshop (semestre 1)

- 5 ECTS
- CM-TD : 36h

Software Design

- 3 ECTS
- CM : 15h
- TD: 7,5h

Strategic Diagnosis

- 1 ECTS
- Project Week

Term Project 1

Semester 2

- 5 ECTS
- CM-TD : 36h

Artificial Intelligence

- 5 ECTS
- CM : 15h
- TD : 30h

Business Economics

- 5 ECTS
- CM-TD : 36h

Business Intelligence

- 5 ECTS
- CM-TD : 36h

Business Process Intelligence

- 5 ECTS
- CM : 15h
- TD : 30h

Intelligence Artificielle

- 5 ECTS
- CM : 15h
- TD : 30h

Micro économie

- 5 ECTS
- CM : 15h
- TD : 30h

Programmation web et open data

- 2 ECTS
- CM-TD 15h

Research Workshop (semestre 2)

- 2 ECTS
- Project or internship (4-6 weeks)

Term Project 2

- 5 ECTS
- CM-TD : 36h

Web Programming

Advanced Databases

Description : This course aims to provide a comprehensive understanding of database concepts and equip students with the skills to implement and query relational databases effectively. Students will consolidate and deepen knowledge of relational databases, and develop practical skills through guided and hands-on exercises.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA129

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher M. Predhumeau

Bases de données relationnelles

Description : This course aims to provide the fundamentals of relational database ranging from modelling to query, and from changing content to changing the structure.

Degree : Licence 3 MIASHS MIAGE

ECTS : 5

Code : ILUMA525

Volume : CM : 18h TD : 27h

Langue / Language : French / English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant / Teacher : L. Perrussel

Data Analysis and Visualisation

Description : Data analysis is more and more important in the understanding business dynamics and supporting informed decision-making, encompassing both descriptive and predictive analytics. This course addresses three fundamental challenges encountered by computer scientists engaged in data analysis: data collection and processing, predictive modeling, and the effective communication of analytical results. The course is structured in three main parts. First, students will acquire competencies in data extraction and preprocessing, including techniques to manage and correct data imperfections (data munging). Second, the course will introduce classical and contemporary analytical methods, such as data mining, Bayesian inference, and regression analysis, alongside foundational machine learning techniques for predictive modeling. Particular emphasis will be placed on methods in explainable artificial intelligence (XAI), enabling students to interpret and communicate the behavior of complex machine learning models with transparency and rigor. Third, students will concentrate on data storytelling as a means to communicate analysis results and findings clearly and effectively. This will involve mastering the principles of narrative construction, visual design, and interactive data presentation, supported by practical experience with tools ranging from predefined visualization libraries to specialized software. Prerequisites: good programming skills, basics of algorithms.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA133

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher : M. Garouani

Innovative Software Methods

Description : The aim of this course is to study new software and innovation processes. This course will consider as a starting point classical processes, namely iterative and incremental processes. It will then go further by first exploring recent techniques such as Xtreme programming; it will then consider new techniques issued from the field of innovation management, at first gamification. Gamification has been recently viewed as a disruptive factor in a software process and fosters innovation. The course will emphasize the experimental dimension: students will experiment numerous games. Prerequisites: software process, project management, Agile development.

Degree : Master 2 2IS

ECTS : 6

Code : IMUMA301

Volume : CM-TD : 45h

Langue / Language : English

Evaluation : Contrôle continu intégral 3 évaluations minimum + semaine bloquée Continuous assessment 3 evaluations + dedicated project week

Enseignant/Teacher M. Chauvin

Internet of Things

Description : This course provides a comprehensive introduction to the Internet of Things (IoT), an emerging technology that interconnects physical devices to the internet, enabling them to collect, share, and act on data.

Students will explore the fundamental concepts, architecture, and components of IoT systems, including sensors, actuators, communication protocols, and data processing and retrieval techniques.

The curriculum covers key areas such as device connection with Raspberry Pi board, the attraction and storage of data in a MongoDB database and their display using web-based technology (including Angular, Node.JS ...).

Through focused hands-on and a term project, students will gain the skills needed to design, implement, and manage IoT solutions.

Particular attention will be paid to the sparing use of the various components and software in order to respect energy resource constraints.

Degree : Master 2 2IS

ECTS : 6

Code : IMUMA305

Volume : CM-TD : 45h

Langue / Language : English

Evaluation : Contrôle continu intégral 3 évaluations minimum + semaine bloquée Continuous assessment 3 evaluations + dedicated project week

Enseignant / Teacher : B. Gaudou & L. Marsan

Object Oriented Programming

Description : This course goes from basic concepts of object oriented programming to more advanced programming concepts and data structures, such as graphs or lambda functions.

The language JAVA will be used throughout the course.

Each session of 3 hours consists of a lecture focused on some specific programming concepts followed by a series of programming exercises.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA131

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher D. Simoncini

Project Management

Description : This course will start with an introduction to agile project management and an overview of agile methodologies, with an emphasis on the problematics surrounding the adoption of these practices. Agile planning will then be the central theme of the course, from project initiation, to estimates and release plan, to monitoring iterations. Additional topics will include how to lead an agile team, managing stakeholders engagement, and ensuring delivery of values in agile projects

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA122

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant / Teacher : B. Marsa

Research Workshop (semestre 1)

Description : Contemporary job market requires a dynamic adaptation to new technologies and practices. The first objective of this weekly workshop is to acquire the capabilities for personal development to be used for life-long personal and group training: information search, elaboration, and presentation. A second objective is to share knowledge and experiences among the group of students to obtain an homogeneous group. Finally, the third objective is to learn how to work in a team, putting in practice what is being learned in the soft skills course. Critical thoughts and constructive attitude will be encouraged.

Degree : Master 1 2IS

ECTS : 2

Code : IMUMA123

Volume : CM-TD : 15h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher D. Simoncini

Software Design

Description : This course focuses on modelling software: it considers at first the structural and behavioral perspectives for analysing user needs; in a second step it focuses on requirements definition and finally overview classical patterns considered in the design stage. The class goes through the main UML diagrams and emphasizes the object paradigm for analyzing and designing a software system.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA119

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher L. Perrussel

Strategic diagnosis

Description : The aim of the course is to provide students with the keys to understanding and analyzing a company, enabling them to make a strategic diagnosis. Intended learning outcomes (ILOs) are:

* Knowing the main notions concerning strategy and strategic diagnosis (vision, mission, key success factors, resources and capabilities, etc.)

* Understanding what a strategy is and how it is constructed through strategic management

* Knowing how strategic diagnosis tools work and how to use them to identify and organize relevant information contained in cases

* Knowing how to identify the most relevant information in order to construct a synthetic SWOT matrix concluding a strategic diagnosis.

Degree : Licence 3 Numérique et Management

ECTS : 3

Code : ILUMC507

Volume : CM : 15h TD : 7,5h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher S. Peze

Term Project 1

Description : This is a group project. Each group is made of 3 or 4 graduates. The composition of the groups is decided by the teachers of the first semester.

The project consists in an analysis of the problem presented in the subject, and in the proposal of a practical, implemented, solution to this problem. A presentation of the problem and of its solution by the graduates is done during a poster and demonstration session.

Degree : Master 1 2IS

ECTS : 1

Code : IMUMA145

Volume : Project week

Langue / Language : English

Evaluation : Projet Project

Enseignant / Teacher : D. Simoncini

Artificial Intelligence

Description : Artificial intelligence is a collection of computational techniques whose applications are revolutionizing the way in which we think and make businesses. The objective of this course is to be able to conceive and program two examples of such applications: a recommender system and automated profiling system, and an automated personal assistant. The techniques that will be learned range from machine learning techniques such as clustering and deep learning, to optimisation, knowledge management, inference, and the basics of natural language processing. Prerequisites: good programming skills, basics of algorithms.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA134

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher C. De La Torre & U. Grandi

Business Economics

Description : Nouveau cours, descriptif en attente. New course, description not yet available.

Degree : Licence 1 Numérique et Management

ECTS : 5

Code : ILUMC116

Volume : CM : 15h TD : 30h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant / Teacher : J. Tafa

Business Intelligence

Description : The objectives of this course are to study the concepts associated to Business Intelligence (BI) as well as to conceive and implement the components of a decision support system. First, we study the decision process in the context of a company strategy. Second, we identify the different components of a decision support system, focusing on new concepts like Self-Service BI. Third, we study how to conceive and deploy a data warehouse (data model, extraction transformation and loading processes, SQL queries). Fourth, we address multidimensional modelling (conceptual, logical and physical models) and implementation. Finally, we study new solutions dedicated to data restitution and data visualisation.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA130

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher R. Tournier

Business Process Intelligence

Description : Business Processes (BPs) are widely recognized as an essential component of Information Systems given the growing need for organizations to both cooperate with others and coordinate their activities inside their own structure.

This course will cover the BP life-cycle including process design and analysis, its enactment as a workflow and also advanced topics around process mining: process discovery, conformance checking and predictive monitoring. Both theoretical backgrounds and tools will be presented to allow students to build Process Aware Information Systems.

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA120

Volume : CM-TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher C. Hanachi

Intelligence Artificielle

Description : This course introduces key challenges in contemporary Artificial Intelligence, covering major subfields such as reinforcement learning, machine learning, fairness, decision-making, and natural language processing, among others. It combines theoretical and practical sessions, enabling students to understand the foundational models behind modern AI applications and apply their knowledge through hands-on Python implementations. Assessment will be based on a semester-long practical project carried out in pairs, as well as a final written exam.

Degree : Licence 3 Numérique et Management

ECTS : 5

Code : ILUMC510

Volume : CM : 15h TD : 30h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher F. Garrido

Micro économie

Description : Nouveau cours, descriptif en attente. New course, description not yet available.

Degree : Licence 2 Numérique et Management

ECTS : 5

Code : ILUMC306

Volume : CM : 15h TD : 30h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant / Teacher : J. Tafa

Programmation web et open data

Description : This course introduces students to the fundamentals of web development, with a focus on HTML, CSS, JavaScript, and related concepts. Students will progressively build their programming skills and their technical competencies. The course emphasizes the development of key soft skills such as time and team management, critical and analytical thinking, problem-solving, decision-making, and effective collaboration. No prior programming experience is required; the course is designed around simple code examples and guided exercises. Students will acquire the necessary coding skills as they progress through the course.

Degree : Licence 2 Numérique et Management

ECTS : 5

Code : ILUMC309

Volume : CM : 15h TD : 30h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher Y. Cossich Lavinas

Research workshop (semestre 2)

Description : Lectures will be organised around three activities:

1. Reading, understanding, and presenting scientific papers (Activity 1): each student will pick one article from a set proposed by a teacher, and prepares a short presentation (15-20 minutes) to explain it to the group, contextualising it to a particular problem.
2. Interview with researchers (Activity 2): each student selects a researcher in Toulouse who works in the topic of the scientific paper chosen, and interview her/him on the latest finding in her/his field, her/his motivation to become a researcher, and her/his connections to industry.
3. Conceiving and writing a group position paper (Activity 2): four groups of students will research on academic topics of their interest (to be approved); The students will work in group to produce a position paper and a make final presentation on the topic .

Degree : Master 1 2IS

ECTS : 2

Code : IMUMA124

Volume : CM-TD : 15h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher Y. Cossich Lavinas

Term Project 2

Description : This is a group project or an individual internship that lasts 4 to 6 weeks at the end of the first year master program.

Degree : Master 1 2IS

ECTS : 2

Code : ILUMC309

Volume : Project / internship

Langue / Language : English

Evaluation : Project / internship defense

Enseignant/Teacher D. Simoncini

Web Programming

Description : Web programming attempts to cover all the skills required for a Full-stack web developper. It aims to start from the bases of front-end development (HTML, CSS, Javascript), before presenting back-end programing (using the framework SpringBoot) and the use of a framework to developer the front-end.

The course objective is to let the students to build a dynamic website (both on front and back-end parts) that build pages from data stored in a database (or from external API).

Degree : Master 1 2IS

ECTS : 5

Code : IMUMA132

Volume : CM –TD : 36h

Langue / Language : English

Evaluation : Contrôle continu intégral 2 évaluations minimum Continuous assessment 2 evaluations

Enseignant/Teacher B. Gaudou

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