Course description

General information		
Course leader	**Nicolas LE HIR**	
Course title	**Applied Artificial Intelligence**	
Study programme	**Title of Expert in Information Technology**	
Course status	**Graduate Program**	
Year	2	
Number of credits and mode of teaching delivery	ECTS student workload coefficient	5
	Number of hours (L+E+S)	(14+8+72) 94

1. COURSE DESCRIPTION

1.1. Course objectives

The module 'Applied Artificial Intelligence' studies several aspects of Artificial Intelligence.

1.2. Conditions for enrolment in the course

No requirement.

1.3. Expected learning outcomes of the course

LO1: Describe AI service and its components

LO2: Explain value and recognize building blocks in cognitive services including AI powered visual analytics

LO3: Manage machine Learning based AI services

LO4: Describe basic robotics concepts including interactive robotics scenarios powered by data

LO5: Explain AI's life and business implications including ethical and social challenges

LO6: Explain how to use AR/VR to unlock and enable value in AI products and services

LO7: Explain how business can benefit from AI

LO8: Discuss how & where AI can be applied in the real life

LO9: Explain the value creation process with AI and technology trends in AI and general policies

1.4. Course content

The lectures are structured on two days.

Lecture 1:

- General discussion on AI
- Concept of Machine Learning

- AI paradigms
- Supervised Learning
- Unsupervised Lerning
- Linear separation
- Kmeans clustering
- Overfitting
- Presentation of the project

Lecture 2:

- Neural networks
- Gradient descent
- Introduction to game theory
- The minimax algorithm and Alpha-Beta pruning
- Intermediate scoring
- Monte-Carlo methods

The students work on a project, aiming at developing an AI which can play a boardgame of intermediate complexity (Phantom of Opera). This will be achieved on a server written in Python and with a Python interface. Firstly, the students build a parser and implement basic determinist strategies, such as hard-coded heuristics or brute force on limited depth.

Secondly, the students are expected to try more strategies such as pruning trees and to find intermediate payoff matrices. They also implement Monte Carlo Methods and learn how to associate a given board to a probable outcome and optimize accordingly.

1.5. Teaching delivery modes:	☒ lectures ☐ seminars and workshops ☐ exercises ☐ remote learning ☐ field work	☒ independent work ☐ multimedia and network ☐ laboratory ☒ mentoring ☐ other _____
1.6. Comments	For the lectures, the course material is taught interactively, giving the students time to ask questions and the teacher time to discuss related topics. As for the project, the students will be supervised by the teacher.	
1.7. Student obligations		
STUDENT ATTENDANCE Class attendance is mandatory in the percentage prescribed by the Studies and examination regulations.		

PASSING EXAM

Each groups of students must submit their results to the teachers and give an oral presentation based on their results. The results are reviewed by the academic staff during an oral examination. A justification of the project work can be explained by the students.

1.8. Monitoring[1] student work

Class attendance		Activity during class		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project	100%	Continuous assessment of knowledge		Student report		Practical work	
Portfolio							

1.9. Assessment and evaluation of student work during classes and the final exam

Every group of students must submit their project on the student platform.

They will be evaluated on the results of the project as well as the oral examination.

CONCRETE REVIEW OF EVALUATION METHODS

The maximum number of points that a student can earn in a course is 100. Grades are calculated according to the following criteria table within which the distribution of passing grades in terms of the number of points is applied.

Points	Grade
0,00 - 50,00	(E) unsatisfactory
50,01 - 58,00	(D) sufficient
58,01 - 75,00	(C) good
75,01 - 92,00	(B) very good
92,01 - 100,00	(A) excellent

The method of accumulating points is determined in this course in accordance with the elements of scoring as follows:

Criterion	Maximum points
Project	100
TOTAL	100

[1] IMPORTANT NOTES: Next to each method of monitoring student work it is necessary to insert an adequate share of each activity in ECTS credits, so the total number of ECTS credits corresponds to the credit value of the course. You can use empty fields for additional activities.

1.10. Required reading (at the moment of submitting the joint study programme report)
1.11. Additional reading (at the moment of submitting the joint study programme report)
1.12. Number of copies of required reading in relation to the number of students who currently attend a course

Title	*Number of copies*	*Number of students*

1.13. Methods of quality monitoring that ensure the acquisition of knowledge, skills and competencies.

The content of each modules is continuously revised to teach the students on the most up-to-date notions and concepts of IT. Indeed, the range of skills and knowledge in this sector is constantly getting broader, with a larger perspective of working in many different fields.
To ensure the quality of the teaching, a Steering Committee supervises the Quality Management System. The evolution of the teaching content is revised and validated by the Development Council. The teachers as well as the administration staff are evaluated by the students themselves. Finally, the teaching content is analysed and determined by evaluating the skills during the internships, by the partner companies.