- Faculté des sciences
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Intelligence artificielle (3IN1007)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Bachelor en mathématiques	**Cours: 2 ph** **Exercice: 2 ph**	**Voir ci-dessous**	6
Bachelor en science des données	**Cours: 2 ph** **Exercice: 2 ph**	**Voir ci-dessous**	6
Bachelor en systèmes naturels	**Cours: 2 ph** **Exercice: 2 ph**	**Voir ci-dessous**	6
Master en informatique	**Cours: 2 ph** **Exercice: 2 ph**	**Voir ci-dessous**	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Printemps

Equipe enseignante

Christos Dimitrakakis
Victor Villin

Contenu

This course will focus on algorithms and models for Artificial
Intelligence. We will concentrate mainly on the decision making, rather than the learning, side of artificial intelligence. Learning is already addressed in statistics courses, as well as the machine learning course in the final year.

The philosophy of this course is as follows:
- We give example problems.
- We use theory to explain and generalise from those examples to general problems.
- We describe algorithms to solve general problems.
- We implement algorithms to solve pecific examples.

In general, the course will start from the simplest problems and slowly progress to the more complex ones.

References:
- Artificial Intelligence: Foundations of Computational Agents.
https://artint.info/
- Artificial Intelligence: A Modern Approach

Detailed syllabus:
1. Agents: preferences, states, actions and beliefs
2. Deterministic problems: Search
3. Dynamic programming, Branch and Bound
4. Constraint Programming
5. Logical reasoning
6. Probabilistic reasoning
7. Expected Utility Theory
8. Markov Decision Processes
9. Zero-Sum Games and Linear Programming
10. Introduction to machine learning (time-permitting)
11. Reinforcement learning (time-permitting)

URLs	1) https://artint.info/ 2) https://github.com/olethrosdc/AI_BSc

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Forme de l'évaluation

- Assignments/Project (40%)
- Exam (60%)

Documentation

- Source code
- Course notes
- Course book

Pré-requis

- Python
- Linear Algebra (vector spaces, matrices)
- Calculus (limits, differentiation, integration)
- Probability (elmentary)

Forme de l'enseignement

2 h. de cours + 2h exercices.
Début des cours à 8h45

The language of instruction is either French or English. All the teaching material is in English. Students can use either language.

La langue d'enseignement est Français ou Anglais. Tout le matériel d'enseignement est en Anglais. Les étudiants peuvent utiliser

Objectifs d'apprentissage

Au terme de la formation l'étudiant-e doit être capable de :

- Explain Algorithms
- Develop Agents
- Formulate Problems
- Integrate Theory and Practice
- Express Ideas

Compétences transférables

- Communicate Ideas
- Present Results

URLs	1) https://artint.info/ 2) https://github.com/olethrosdc/AI_BSc