Essentials of Artificial Intelligence: a Beginner's Guide (E099210)

Course size (nominal values; actual values may depend on programme)

Credits 3.0   **Study time** 90 h

Course offerings and teaching methods in academic year 2026-2027

A (semester 1)	English	Gent	lecture
			seminar

Lecturers in academic year 2026-2027

Dambre, Joni	TW06	lecturer-in-charge

Offered in the following programmes in 2026-2027	crdts	offering
Bachelor of Science in Engineering Technology(main subject Civil Engineering Technology)	3	A
Bachelor of Laws in Laws	3	A
Bachelor of Science in Business Administration	3	A
Bachelor of Science in Business Economics	3	A
Bachelor of Science in Engineering: Architecture	3	A
Bachelor of Science in Public Administration and Management	3	A
Master of Science in Teaching in Social Sciences(main subject Sociology)	3	A
Master of Science in Complementary Studies in Business Economics(main subject Business Economics)	3	A
Master of Science in Engineering: Architecture	3	A
Master of Science in Industrial Design Engineering Technology	3	A
Master of Science in Sociology	3	A
Master of Science in Urbanism and Spatial Planning	3	A
Exchange Programme Architecture	3	A
Exchange Programme Urbanism and Spatial Planning	3	A
Ghent University Elective Courses	3	A
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Master of Science in Teaching in Languages (abridged programme)(main subject African Languages and Cultures)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)(main subject Archaeology)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)(main subject Art History, Musicology and Theatre Studies)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Biochemistry and Biotechnology)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Bioengineering)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main	3	A

subject Biology)		A
Master of Science in Teaching in Economics (abridged programme)(main subject Business Administration)	3	A
Master of Science in Teaching in Economics (abridged programme)(main subject Business Economics)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Chemistry)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)(main subject Communication Science)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Computer Science)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)(main subject Criminological Sciences)	3	A
Master of Science in Teaching in Languages (abridged programme)(main subject East European Languages and Cultures)	3	A
Master of Science in Teaching in Economics (abridged programme)(main subject Economics)	3	A
Master of Science in Teaching in Behavioural Sciences (abridged programme)(main subject Educational Sciences)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Engineering and Technology)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Geography and Geomatics)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Geology)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)(main subject History)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)(main subject Laws)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Mathematics)	3	A
Master of Science in Teaching in Health Sciences (abridged programme)(main subject Medical Sciences)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)(main subject Moral Sciences)	3	A
Master of Science in Teaching in Languages (abridged programme)(main subject Oriental Languages and Cultures)	3	A
Master of Science in Teaching in Health Sciences (abridged programme)(main subject Pharmaceutical Sciences)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)(main subject Philosophy)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)(main subject Physics and Astronomy)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)(main subject Political Science)	3	A
Master of Science in Teaching in Behavioural Sciences (abridged programme)(main subject Psychology)	3	A
Master of Science in Teaching in Economics (abridged programme)(main subject Public Administration and Management)	3	A
Master of Science in Teaching in Health Sciences (abridged programme)(main subject Social Health Sciences)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)(main subject Sociology)	3	A
Master of Science in Teaching in Health Sciences (abridged programme)(main subject Veterinary Medicine)	3	A
Master of Science in Teaching in Arts and Humanities (abridged programme)	3	A
Master of Science in Teaching in Languages (abridged programme)	3	A
Master of Science in Teaching in Behavioural Sciences (abridged programme)	3	A
Master of Science in Teaching in Economics (abridged programme)	3	A
Master of Science in Teaching in Health Sciences (abridged programme)	3	A
Master of Science in Teaching in Physical Education (abridged programme)	3	A
Master of Science in Teaching in Science and Technology (abridged programme)	3	A
Master of Science in Teaching in Social Sciences (abridged programme)	3	A

Teaching languages

English

Keywords

artificial intelligence, machine learning, neural networks

Position of the course

In recent years, the presence of AI in our daily lives has steadily increased. Its impact is much larger than many people realize. Especially since the launch of ChatGPT, AI is often mentioned in media reports.
In 2012, a neural network crashed all records in the ImageNet challenge, an international competition for computer algorithms that recognise objects in images. This milestone relaunched the field of neural networks, a subfield of AI. Since then, neural networks have become the driving force behind many breakthroughs.
This course creates a frame of reference that will allow students to understand the evolutions in AI and to critically interpret reports about AI breakthroughs in the media. The most important technical principles are explained in an intuitive way, using examples and demonstrations. Throughout the course, there will be a strong focus on critical analysis and reflection. It is explicitly not the aim of this course to educate students to develop their own AI applications.

Contents

- Introduction: terminology, types of AI, history, applications
- Principles of machine learning
- The importance of data
- Neural networks
- AI for computer vision
- Language models
- AI in robotics
- Ethical implications of AI
- Regulations related to AI
- Recent topics: impact of AI on humankind and society

Initial competences

For this course, no specific knowledge with respect to programming or mathematics is required. The course is taught in English. This means students need to be able to read articles in English from media sources or (non-technical parts of) scientific papers, to critically reflect on them and communicate or report on them in English.

Final competences

1. Understanding the distinction between AI, machine learning, and neural networks.
2. Being able to explain the role of data and understanding the consequences of the properties of this data.
3. Interpreting the role of algorithms and optimization criteria and comprehending the implications of certain choices made in this regard.
4. When given an application, being able to assess what to consider when collecting and using data to train AI models.
5. Adopting a critical-scientific attitude towards AI.
6. Interpreting news and information about AI, asking critical questions, and identifying where this information may be incomplete or possibly incorrect.
7. Being aware of the complexity of AI applications and their implications for ethical issues and the establishment and enforcement of regulations.
8. Reflecting from multiple perspectives on the applications of contemporary developments in AI and their consequences for individuals and society.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture, Independent work

Extra information on the teaching methods

Multiple contact sessions will be preceded or followed by an individual assignment which is part of the evaluation.

The lectures will be a mixture of knowledge transfer and active knowledge processing through interactive learning activities. Participation to these activities is part of the evaluation, which means that participation to the lectures is mandatory! To ba able to participate to some of those activities, students will also need to bring their own smartphone, laptop or tablet.

At the end of the semester, we will focus on recent applications and the consequences of recent developments in AI for humankind and for society. For some of these topics, guest speakers can be invited to elaborate on specific aspects such as ethics or regulations and to debate with the students about this.

Study material

Type: Slides

> Name: Lecture slides
> Indicative price: Free or paid by faculty
> Optional: no
> Language : English
> Available on Ufora : Yes

Type: Reader

> Name: Selected accessible scientific papers that provide background information
> Indicative price: Free or paid by faculty
> Optional: no
> Language : English
> Available on Ufora : Yes

Type: Other

> Name: Lecture notes made by student during lectures
> Indicative price: Free or paid by faculty
> Optional: yes
> Additional information: It is strongly advised to take notes during the lectures, especially during interactive activities and in-class discussions

References

Multiple sources that are available onlinewill be mentioned in class (and on the lecture slides). Accessible scientific publications that are part of the learning material for this course will be made available through Ufora.

Course content-related study coaching

The teacher will be available for questions during and after class. For all other interaction about the contents of the course, MsTeams will be used.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Participation, Peer and/or self assessment, Written assessment

Possibilities of retake in case of permanent assessment

examination during the second examination period is not possible

Extra information on the examination methods

During permanent evaluation, aspects of knowledge acquisition are evaluated, but the focus is on the application of these concepts to concrete situations. This evaluation consists in part of participation and in part of the active exploration of the learning materials through assignments. There is no second chance for these activities.

The exam (periodic evaluation) will evaluate knowledge and understanding through direct questions, but also your ability to apply this, for example to critically analyse an application or a media announcement. These competences are acquired through active participation during lectures.

Calculation of the examination mark

Permanent evaluation 40% - Periodic evaluation (exam) 60%
The grade for permanent evaluation is calculated from participation scores and assignment scores.

Attendance to classes and participation in the activities in class is mandatory and necessary to achieve the learning goals. Learning goals that are practiced during these activities are an integral part of the exam material. Students who miss out on more that three lectures without legitimate cause for absence cannot pass the course in the academic year. In that case, the maximal course grade is 7/20 for both exam sessions.

Students who obtain a total score below 8/20 for the exam cannot pass the course in the first exam session. Their course grade will be no higher than 8/20.

There is no second chance for the permanent evaluation: during the resit exam period, permanent evaluation grade obtained during the semester counts for 25%, the resit exam for 75%.

Facilities for Working Students

Lecture attendance is mandatory. No exceptions can be made on the rules formulated above. Students who have a recurring problem with lecture attendance are advised to select a different course.