COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
AI in Education: Theory, Practice, and Ethics	

Lecturer(s)	Department(s) where the course unit (module) is delivered
Coordinator: assist. prof. Jogaila Vaitekaitis **Other(s):** ***In a non-recurring way, the course will also give place to theoretical and practical interventions of foreign researchers and experts in the field.*	VU Faculty of Philosophy, Institute of Educational Sciences

Study cycle	Type of the course unit (module)
First (Bachelor)	Elective

Mode of delivery	Period when the course unit (module) is delivered	Language(s) of instruction
Blended	Autumn semester	English

Requirements for students	
Prerequisites: English language	**Additional requirements (if any):** Group size no more than 20 students **Intermediate computer proficiency** courses are designed for individuals who already have good understanding of technology. Participants will build upon their skills by learning how to use a variety of resources, including learning apps, Microsoft 365 apps, and photo and video editing platforms.

Course (module) volume in credits	Total student's workload	Contact hours	Self-study hours
5	130	48	82

Purpose of the course unit (module): programme competences to be developed
Module Description: This module serves as a prerequisite for educators, students or policy-makers interested in the intersection of AI and education. It explores foundational AI models, the art of prompting AI for educational outcomes, the role of AI in pedagogy, and the ethical landscape surrounding AI in education. The module also includes practical

segments and encourages critical reflection on ethical implications such as plagiarism, data privacy, and the broader societal impacts, including issues of equity and inclusivity.

Subject (Module) Objective:

The objective of this module is to equip participants with a nuanced understanding of Artificial Intelligence (AI) in educational contexts, appreciating both its transformative potential and the ethical considerations it necessitates. The module aims to foster competencies in:
1. Understanding the role and scope of AI in educational settings, particularly in terms of pedagogical applications (general competence).
2. Engaging with AI tools to enhance pedagogical practices (subject-specific competence).
3. Navigating the ethical terrain that AI in education presents, with a particular focus on issues of equity, inclusivity, and accountability (subject-specific competence).

Learning Objectives:

Upon successful completion of this module, students will be able to:
1. Articulate the impact of AI and its trajectory in education, including key generative models like ChatGPT, Bard, Bing, and Claude2.
2. Evaluate the role of AI in curriculum design, formative assessment, and fostering active learning environments.
3. Demonstrate the ability to prompt AI tools effectively to achieve specific educational outcomes and troubleshoot undesired AI behaviours.
4. Engage in critical discussions on the ethical implications of AI in education, with a particular focus on issues of plagiarism, bias, and data privacy.
5. Apply AI tools to design a sample syllabus and a low-stakes test, while taking into account ethical considerations, by the end of the module.
6. Reflect on the potential future of AI in education, considering both the opportunities for enhanced personalized learning and the challenges of ensuring equitable access and student accountability.

Learning outcomes of the course unit (module)	Teaching objectives and learning methods	Assessment methods
Subject-Specific Competences:		
AI Pedagogical Strategies	Develop and apply AI-enabled pedagogical strategies. Blended learning: Mini-workshops, Interactive online sessions, Group projects	Project activities, Preparation and presentation of submissions, Performance evaluation
Ethical Consideration in AI Education	Navigate ethical considerations of AI in education. Blended learning: Debates, Case studies, Online forums	Essay writing (human+AI), Review of essay; analysis of literature and other sources, Presentation
Practical Application of AI	Utilize AI tools for practical educational purposes. Blended learning: Practical work, Online tutorials, Interactive demonstrations	Practicality Testing, Project activities, Performance evaluation
AI for Enhanced Learning Experiences	Employ AI tools for personalized and enriched learning experiences. Blended learning: Scenario-based learning, Online forums, Mini-workshops	Projects (individual and group), Performance evaluation, Portfolio approach
Critical Evaluation of AI Tools	Critically evaluate effectiveness and ethical implications of AI tools.	Essay writing, Compiling a bibliography list,

	Blended learning: Debates, Group discussions, Problem-based learning	Presentation
Collaborative Learning with AI	Engage in collaborative learning environments facilitated by AI. Blended learning: Group projects, Interactive online sessions, Peer learning	Group learning, Peer reviews, Preparation and presentation of submissions
General competences:		
Ability to Analyze and Systematize:	Understand the foundational principles and models of AI. Blended learning: Engaging lectures, Group discussions, Problem-based learning	Essays (Person+AI), Concept maps, Open- and closed-ended questions/tasks
Ability to Apply Knowledge in Practice:	Demonstrate practical application of AI tools in enhancing teaching and learning processes. Ability to Apply Knowledge in Practice	Practicality Testing, Performance evaluation, Project activities
Ability to Organize and Plan	Plan and organize AI-enabled educational activities. Blended learning: Mini-workshops, Group projects, Interactive online sessions	Blended learning: Mini-workshops, Group projects, Interactive online sessions
Independence	Work independently to explore, evaluate, and implement AI tools in education. Blended learning: Independent analytical essays, Online research, Self-directed learning tasks	Essay writing, Research paper, Project activities
Communication Skills:	Communicate the principles and implications of AI in education orally and in writing, both in the mother tongue and in a foreign language. Blended learning: Debates, Presentations, Online forums	Oral and written questioning, Presentation, Peer reviews
Information Processing:	Find, analyze, and synthesize information from diverse sources regarding AI in education. Blended learning: Engaging lectures, Online research, Group discussions	Testing, Concept maps, Essay writing
Ability to Adapt to New Situations:	Adapt to the evolving landscape of AI in education and its emerging tools and practices. Blended learning: Scenario-based learning, Simulation games, Online forums, Case studies.	Case studies, Review of literature and other sources, Testing
Initiative and Entrepreneurship:	Exhibit initiative in exploring new AI tools and integrating them innovatively in educational settings. Blended learning: Project-based learning, Mini-workshops, Online research	Projects (individual and group), Performance evaluation, Portfolio approach
Initiative and Entrepreneurship:	Exhibit initiative in exploring new AI tools and integrating them innovatively in educational settings. Blended learning: Debates, Group discussions, Problem-based learning	Essay writing, Compiling a bibliography list, Presentation
Use of Information Technology:	Proficiently use AI tools and other relevant information technology in educational contexts. Blended learning: Online tutorials, Interactive demonstrations, Practical work	Practicality Testing, Project activities, Performance evaluation

| Content: breakdown of the topics | Contact hours | | | | | | | Self-study work: time and assignments | |
	Lectures	Tutorials	Seminars	Exercises	Laboratory work	Internship/work	Contact hours	Self-study hours	Assignments
1. Greetings, introduction and overview of the course	2		2				4	2	**Assignment:** Create a written description and mind-map illustration of your "journey" to these studies: what inspired you, what people, events, media, experiences, "influencers", etc. have led you to be here today (in these studies, on this module). Please update the mind-map presented during the introductory seminar using digital tools and write a one to two page free-form essay. Be ready to present your "journey" to colleagues.
2. Introduction to Generative Artificial Intelligence: Definitions, Applications, and Ethical Concerns	2		2				**4**	3	**Assignment**: Take Google's "Introduction to Generative AI" test and provide proof by taking the quiz and getting a badge. Suggested Reading: "Ask a Techspert: What is generative AI?"
3. Understanding Foundational AI Models: (1) ChatGPT & Bard (2): Bing & Claude2	4		2				**6**	5	**Assignment**: Experiment with models to create a simple lesson plan. Compare results Suggested Reading: "Google Research, 2022 & beyond: Generative models"; "Stanford U & Google's Generative Agents Produce Believable Proxies of Human Behaviors"
4. AI in the Classroom: Pedagogy, Productivity, Policy	2						2	6	**Assignment:** Group A will read the paper titled "The Science of Effective Learning: Spacing Retrieval Practice and Metacognition of Strategy Use" using traditional reading and answering methods without the assistance of AI tools. Group B will engage with the same paper but are encouraged to utilize an AI tool of their choice to assist in question answering. Questions: 1. Explain the difference between spacing and massed learning strategies. How do they impact knowledge retention and transfer? 2. Give examples of how spacing and retrieval practice can be applied in real-world educational settings? (Focus on different age groups and subjects) 3. Discuss how spacing and retrieval practice could be implemented in a high school biology class. What schedule and types of activities would you suggest? 4. Provide an example where a learner's metacognitive skills might lead them to modify their study approach. 5. Reflect on your own learning experiences. Can you identify instances where

#	Topic									Details
										you have used or could have benefited from spacing or retrieval practice?
5.	Mastering the Art of Prompting AI for Educational Outcomes	2		2				4	6	**Assignment**: Create a set of prompts for AI that could be used in a classroom setting. Suggested Reading: "Generative AI: Perspectives from Stanford HAI"
6.	Building a Syllabus with generative AI	2		2				4	6	**Assignment**: Use AI to draft a syllabus for a hypothetical course. Suggested Reading: "The future of generative AI is niche, not generalized
7.	Low-Stakes Testing with AI: How AI can be used for formative assessments and low-stakes testing.	2		2				4	6	**Assignment**: Design a low-stakes test using AI. Suggested Reading: "Proactive Risk Management in Generative AI"
8.	AI and Assessment: How AI is changing the landscape of educational assessments and what to be cautious about.	2						2	10	**Assignment** (35% of final grade) Part 1: Writing and Being Assessed **Essay Topic**: Write a 500-word essay on one of the following personal topics: "The Best Teacher of My Life" "My Favorite Toy Growing Up" "A Tradition That Means a Lot to Me" **Assessment**: Your essay will be assessed by the instructor and an AI scoring system. **Reflection**: Write a 200-word reflection comparing your experience of being graded by a human and an AI. **Part 2: Assessing Others** Peer Assessment: You will be given an anonymized essay from a peer to assess based on a given rubric. **AI Assessment of Peer Essay**: The same essay will also be graded by an AI system. **Reflection**: Write another 200-word reflection comparing your experience of assessing a peer's essay and seeing how an AI assessed it. **Assessment Criteria:** Quality of the initial essay Depth of the two reflections Quality of your peer review Additional info on assessment described below, in the section: **Final assessment strategy**.
9.	Student Accountability with AI: Exploring teaching strategies and how AI can help in maintaining student accountability.	2						2	6	**Assignment**: Write a reflection on how AI could be used to improve student accountability. Suggested Reading: "How Generative AI Is Changing Creative Work"
10.	Benefits, Pitfalls, and Case Studies of AI in	2						2	4	**Assignment**: Analyze a case study focusing on the pitfalls of AI in education.

Topic								Description
Education: Discussion of real-world case studies, benefits, and pitfalls of AI in education.								Suggested Reading: "The implications of Generative AI for businesses"
11. Regulatory Frameworks for AI in Education: Based on UNESCO guidelines, discussion on existing and needed regulations.	2					2	4	**Assignment**: Summarize the UNESCO guidelines on generative AI in education. Suggested Reading: "Generative AI and the future of education: UNESCO"
12. Ethical Considerations: Equity and Inclusivity: Discussion on how to ensure AI in education is equitable and inclusive; Data Privacy and Copyright: Deep dive into the ethical considerations of using AI in education, focusing on data privacy and copyright issues.	4	2				6	12	**Assignment**: Ethical Case Study Analysis (35% of final grade) This assessment involves a thorough analysis of a real-world case study related to ethical considerations in AI in Education (AIEd). Students are required to critically examine the case, identify key ethical issues, and propose thoughtful solutions or strategies to address these issues. Detailed assessment criteria described in below, in the **Final assessment strategy**. **Suggested Reading:** "Global education monitoring report, 2023: technology in education: a tool on whose terms?" Chapter 16: Equity, specifically the section on Focus 161: First-generation students have it hard everywhere; "Global education monitoring report, 2023: technology in education: a tool on whose terms?" Chapter 8: Governance and regulation, specifically the section on Digital privacy safety and wellbeing.
13. AI Applications in Education: presentations	4	2				6	12	**Assignment:** AI Applications in Education Presentation (30 % of final grade) Prepare a presentation that outlines the AI application, its implementation, benefits, potential challenges, and ethical considerations. Detailed assessment criteria described below, in the **Final assessment strategy**.
Total	**32**	**16**				**48**	**82**	

Final assessment strategy	Weight ,%	Deadline	Assessment criteria
AI and Assessment Assignment	(35%)	Week 9-10	**Description**: This assessment focuses on how AI is changing the landscape of educational assessments. It consists of two parts: • Part 1: Students write a 500-word essay on a personal topic and reflect on their experience of being graded by both a human and an AI system.

			• Part 2: Students perform a peer assessment on an anonymized essay and compare this experience with an AI's assessment of the same essay. **Evaluation Criteria:** • Quality of the Initial Essay (7%): Assessment of the essay's content, structure, and coherence. • Depth of the Two Reflections (8%): Evaluation of the insights and depth in the reflections comparing human and AI grading. • Quality of Peer Review (5%): Assessment of the thoroughness, fairness, and constructiveness of the peer review.
Ethical Case Study Analysis This assessment involves a thorough analysis of a real-world case study related to ethical considerations in AI in Education (AIEd). Students are required to critically examine the case, identify key ethical issues, and propose thoughtful solutions or strategies to address these issues.	35%	Week 13	**Objectives**: • To develop students' ability to apply ethical concepts and frameworks to real-world scenarios in AIEd. • To enhance critical thinking and problem-solving skills in the context of ethical dilemmas in AI applications in education. **Assignment**: • Students will select or be provided with a case study that presents an ethical dilemma or issue in the field of AIEd. • Conduct a detailed analysis of the case, identifying the key ethical concerns and challenges presented. • Critically evaluate the implications of these ethical issues for stakeholders involved (e.g., students, educators, institutions, and society). • Propose well-reasoned solutions or strategies for addressing the identified ethical issues, considering both short-term and long-term implications. **Submission Requirements:** • A written report of approximately 1500-2000 words. • The report should include an introduction to the case, detailed analysis, identification of ethical concerns, and proposed solutions. • References to relevant ethical theories, frameworks, and literature should be included and properly cited. **Evaluation Criteria:** • Depth of Analysis (5%): Comprehensive and insightful examination of the case study and its complexities.

			• Identification of Ethical Concerns (5%): Clarity and accuracy in identifying the key ethical issues in the case study. • Proposed Solutions (5%): Creativity, feasibility, and effectiveness of the proposed solutions or strategies.
AI Applications in Education Presentation **Objectives**: To encourage students to explore a wide range of AI applications in education beyond syllabus design. To assess students' ability to understand, apply, and communicate AI concepts in an educational context.	30%	Week 17	**Assignment:** • Students select an AI application, such as adaptive learning systems, AI-driven personalization, AI in assessment, etc. • Develop a project or conceptual framework utilizing the selected AI application. This could be a lesson plan, a learning tool, an assessment method, or any innovative educational application of AI. • Prepare a presentation that outlines the AI application, its implementation, benefits, potential challenges, and ethical considerations. **Submission Requirements:** • A multimedia presentation of 10-15 minutes, clearly explaining the AI application and its educational relevance. • Visual elements (such as diagrams, charts) should be used to illustrate concepts. • Sources and references must be cited according to academic standards. **Evaluation Criteria:** • Creativity and Innovation (12%): Originality and inventiveness in the application of AI in education. • Alignment with Educational Best Practices (10%): How well the project aligns with current educational practices and theories. • Ethical Considerations (8%): Depth of understanding and addressing of ethical issues related to the AI application.

Author	Year of publication	Title	Issue of a periodical or volume of a publication	Publishing place and house or web link
Compulsary reading				
Generative AI and the future of education				

1. Generative AI and the future of education:UNESCO. Assistant Director-General for Education, 2018- (Giannini, Stefania) [19]
2. AI Index Report 2023 – Artificial Intelligence Index (stanford.edu)
3. K-12 AI curricula A mapping of government-endorsed AI curricula ED-2022/FLI-ICT/K-12 K-12 AI

curricula: a mapping of government-endorsed AI curricula - UNESCO Digital Library
4. Unlocking the power of generative AI models and systems such as GPT-4 and ChatGPT for higher education: A guide for students and lecturers (econstor.eu)
5. Escalante, J., Pack, A., & Barrett, A. (2023). AI-generated feedback on writing: insights into efficacy and ENL student preference. International Journal of Educational Technology in Higher Education, 20(1), 1-20.

Introduction to Generative AI (G-GENAI-I)
1. Ask a Techspert: What is generative AI? https://blog.google/inside-google/googlers/ask-a-techspert/what-is-generative-ai/
2. Build new generative AI powered search & conversational experiences with Gen App Builder: https://cloud.google.com/blog/products/ai-machine-learning/create-generative-apps-inminutes-with-gen-app-builder
3. What is generative AI? https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-generative-ai
4. Google Research, 2022 & beyond: Generative models: https://ai.googleblog.com/2023/01/google-research-2022-beyond-language.html#Gener ativeModels
5. Building the most open and innovative AI ecosystem: https://cloud.google.com/blog/products/ai-machine-learning/building-an-open-generativ e-ai-partner-ecosystem
6. Generative AI is here. Who Should Control It? https://www.nytimes.com/2022/10/21/podcasts/hard-fork-generative-artificial-intelligen ce.html
7. Stanford U & Google's Generative Agents Produce Believable Proxies of Human Behaviors: https://syncedreview.com/2023/04/12/stanford-u-googles-generative-agents-produce-b elievable-proxies-of-human-behaviours/
8. Generative AI: Perspectives from Stanford HAI: https://hai.stanford.edu/sites/default/files/2023-03/Generative_AI_HAI_Perspectives
9. Generative AI at Work: https://www.nber.org/system/files/working_papers/w31161/w31161.pdf
10. The future of generative AI is niche, not generalized: https://www.technologyreview.com/2023/04/27/1072102/the-future-of-generative-ai-isniche-not-generalized/
11. The implications of Generative AI for businesses: https://www2.deloitte.com/us/en/pages/consulting/articles/generative-artificial-intellig ence.html
12. Proactive Risk Management in Generative AI: https://www2.deloitte.com/us/en/pages/consulting/articles/responsible-use-of-generati ve-ai.html
13. How Generative AI Is Changing Creative Work: https://hbr.org/2022/11/how-generative-ai-is-changing-creative-work

Readings on large language models:

1. NLP's ImageNet moment has arrived: https://thegradient.pub/nlp-imagenet/
2. LaMDA: our breakthrough conversation technology: https://blog.google/technology/ai/lamda/
3. Language Models are Few-Shot Learners: https://proceedings.neurips.cc/paper/2020/file/1457c0d6bfcb4967418bfb8ac142f64aPaper.pdf
4. PaLM-E: An embodied multimodal language model: https://ai.googleblog.com/2023/03/palm-e-embodied-multimodal-language.html
5. PaLM API & MakerSuite: an approachable way to start prototyping and building generative AI applications: https://developers.googleblog.com/2023/03/announcing-palm-api-and-makersuite.html
6. The Power of Scale for Parameter-Efficient Prompt Tuning: https://arxiv.org/pdf/2104.08691.pdf ● Google Research, 2022 & beyond: Language models: https://ai.googleblog.com/2023/01/google-research-2022-beyond-language.html/Langu ageModels
7. Solving a machine-learning mystery: https://news.mit.edu/2023/large-language-models-in-context-learning-0207

Optional reading

1. Recent UNESCO resources on AI in education: Artificial intelligence in education | UNESCO
2. Attention is All You Need: https://research.google/pubs/pub46201/
3. Transformer: A Novel Neural Network Architecture for Language Understanding: https://ai.googleblog.com/2017/08/transformer-novel-neural-network.html
4. Transformer on Wikipedia: https://en.wikipedia.org/wiki/Transformer_(machine_learning_model)#:~:text=Transfor mers%20were%20introduced%20in%202017,allowing%20training%20on%20larger%20da tasets.
5. What is Temperature in NLP? https://lukesalamone.github.io/posts/what-is-temperature/
6. Model Garden: https://cloud.google.com/model-garden
7. Auto-generated Summaries in Google Docs: https://ai.googleblog.com/2022/03/auto-generated-summaries-in-google-docs.html