Department	MUC.DAI
Course title	**sustAInability - sustainability and artificial intelligence**
Course number	
Hours per week (SWS)	approx. 4 SWS; bi-weekly seminar sessions over 10 weeks and workshop week
Number of ECTS credits	6

Course objective

Sustainability and digitalization are at the center of scientific, political, and environmental debates as the two significant transformations of our time. Artificial intelligence (AI) is coming into focus, permeating public and private life and increasingly becoming part of sustainability debates. AI has the potential to help us address some of the most pressing challenges of our time, such as climate change, resource depletion, and inequality. For example, AI can be used to optimize energy consumption, reduce waste, and improve the efficiency of transportation and other systems. At the same time, it is important to consider the potential social and environmental impacts of AI and to ensure that it is developed and used in a responsible and sustainable way.

Prerequisites

This module is aimed at all students enrolled in a Master or third year of Bachelor program at the TUM or the Hochschule München University of Applied Sciences (HM); it is thus designed as an interdisciplinary venue which brings together a range of scientific perspectives. No specific prior knowledge is required; however, its project-based character requires high levels of intrinsic motivation and the willingness to actively participate in a project. Students with a technological background are as welcome as students from social sciences, economics, design or humanities.

Recommended reading

[1] van Wynsberghe, A. (2021). Sustainable AI: AI for sustainability and the sustainability of AI. AI and Ethics,
(https://www.researchgate.net/publication/349639276_Sustainable_AI_AI_for_sustainability_and_the_ sustainability_of_AI)
[2] Vinuesa, R., Azizpour, H., Leite, I., Balaam, M., Dignum, V., Domisch, S., Felländer, A., Langhans, S. D.,Tegmark, M., and Nerini, F. F. (2020). The role of artifcial intelligence in achieving the sustainable development goals. Nature Communications, https://www.nature.com/articles/s41467-019-14108-y
[3] more reading materials will be provided in the self-study materials

Teaching methods

The module draws on the ideas of service-learning and project-based learning. A range of teaching & learning techniques will be applied:
- Self-Study and Seminar-Phase: Students will be provided with a reading list, news articles, podcasts, and videos on an online platform. These materials allow students to individually gain first insights on the topic. The accompanying written assignments as well as the short presentation on a specific topic will help them to structure the newly acquired knowledge.
- Group work: After nine weeks of alternating self-study phases and seminar sessions which provide (expert-)input on the core topics, students will learn to apply agile methods and work on their projects in groups in the workshop week. Progress will be assessed through project presentations by the end of the workshop week as well as continuous feedback from the instructors, from external experts, and as peer-to-peer feedback.
- Presentational skills: Will be further facilitated through the requirement to present ongoing and final results within the seminar and at a final presentation with stakeholders.

Assessment methods

The module contains self-study phases as well as bi-weekly seminar sessions and an intensive, interactive one-site workshop week. Following the idea of flipped-classroom, students are expected to acquire knowledge during the self-study phase to be able to participate in profound discussions during the seminar sessions and to actively tackle current challenges in the field of AI and sustainability during the workshop week.
Over the course of this module, students will have to complete the following tasks:
- Self-Study and Seminar Phase: students have to contribute to the first part of the module by carefully reading the provided material and by completing the accompanying assignments in written and oral form preparatory to the workshop week. The assignments will be presentations or essay-writing in order to prepare and understand the main focus of each unit. They also have to actively take part in the seminar sessions and discussions on-site. The preparation of and the participation in the seminar sessions count 60% to the final grade.
- Workshop-Week: students have to form interdisciplinary groups, choose a real challenge and develop a project. By the end of the workshop week students are expected to present their project at the public conference. This presentation counts 40% to the final grade.

Language of instruction	English

Courses in English
Course Description

Name of lecturer	responsible: Prof. Dr. Gudrun Socher; lecturers are a team of coaches and experts
Email	gudrun.socher@hm.edu
Link	
Course content	Sustainability as a central, political and societal goal, can instead serve as an orientation framework for the responsible development of AI technologies as well as a compass for their use. For this to succeed, both sociological and technical perspectives are necessary. For universities - but also for other institutions in politics, society and business - this means that disciplinary boundaries must increasingly be broken down and interdisciplinary teaching and learning formats should be created. One such format is "sustAInability" during which students approach AI from various sustainability perspectives in a self-study phase and seminar units, and then develop application-oriented technical and non-technical solutions in the context of AI & sustainability themselves in a workshop week.
	During the self study phase and the seminar sessions, students will read relevant literature, watch videos and complete assignments, prepare short presentations, attend lectures and subsequently discuss the gained insights.
The workshop week will start with a futurizing workshop, allowing the students to imagine desirable future scenarios and to derive strategies for the present. Afterwards students will tackle selected challenges in the field of AI and sustainability. Students will regularly receive feedback and are expected to present their results in a pitch by the end of the workshop.
Remarks	