MODULE B – Application (Courses)

Courses are courses with an immanent examination character and mandatory attendance. In the courses, students work through the teaching content step by step together with the instructors in an experience and application-oriented manner.

B.1 - Application: Technical aspects in AI (Course)

Content:

- Learning the basics of a programming language (Python) with the support of a programming co-pilot
- Collecting, cleaning, and preparing data for AI applications
- Trying out various AI applications such as classification (supervised learning), exploration of large datasets (unsupervised learning), generation of content such as texts, images, and music (generative models), and finding information (content recommendation) with the help of existing libraries of AI applications
- Visualization of the results of AI applications
- Analysis of the functionality of AI applications with regard to their accuracy and possible biases

Expected Learning Outcomes and Acquired Competences:

After completing this sub-module, students will be able to:

- Use AI applications from the area of supervised learning and unsupervised learning with the support of a programming co-pilot and common libraries (scikit-learn) in Python and visualize their results
- Interact with various current generative models and content recommendation systems and compare them with each other
- Interpret common metrics for evaluating AI applications, such as accuracy and F1 score, and use them to examine the functionality of AI applications

B.2 - Application: Ethical, legal, economic or educational aspects in AI (Course)

Module B.2 consists of sub-courses, each conveying different fields of action. ***When registering, one of the sub-courses must be chosen.***

a) Sub-Course: Application - Ethical aspects of AI:

Content:

- Application of theoretical concepts
- Taking positions and learning analytical competencies on questions regarding existing AI systems (e.g., COMPAS algorithm, autonomous weapon systems, etc.)

Expected Results of Study and Acquired Competences:

Upon completion of the course, students will be able to:

- Reproduce and apply basic concepts of normative ethics in general and technology ethics in particular
- Recognize and analyze ethical problems in the development and use of AI systems
- Apply central concepts, positions, and theories of AI ethics to further areas of application of AI

b) Sub-Course: Application - Legal aspects of AI:

Content:

- Analysis of the applicable legal framework for the use of AI systems, analysis of data protection requirements, and assessment of liability risks when using AI systems
- Discussion of copyright issues in the context of AI-generated content (exclusive rights to AI-generated content, use of copyrighted works as AI training data)

Expected Learning Outcomes and Acquired Competences:

Upon completion of the course, students will be able to:

- Recognize the legal issues relevant to the use of AI and assign them to one of the classical legal areas (data protection law, IT contract law, liability law, AI regulatory law, copyright law)
- Regulatory instruments: recognize the regulatory instruments relevant to the use of AI (laws, EU regulations, and EU directives), name their scope of application, and apply them in basic terms to the specific case
- Legal risks: recognize the legal risks associated with the use of AI and identify the need for professional legal advice
- Fundamentals of data protection law: recognize the fundamentals of data protection law and the specific requirements in connection with AI on the basis of the GDPR as well as the EU-AI Act in overview
- Fundamentals of liability law: name the system-related deficits of the tort liability system when using AI and explain the basics of strict liability according to the proposal for an EU AI Liability Directive.

- Fundamentals of copyright law: understand fundamental questions of copyright law in the context of AI and discuss the problems discussed in the literature
- Legal risks: identify legal risks in connection with the use of AI systems, assess them in basic terms, and adequately estimate the necessity of professional legal advice
- Problems of AI law: critically reflect on the legal problems associated with the use of AI in selected legal areas (e.g., regulatory law, liability law, and copyright law)

c) Sub-Course: Application - Economic aspects of AI:

Content:

- Explain the use of AI in organizational development
- Know the components of a data-based business model
- Case study analysis on the impact of AI systems on the working world
- Market analyses considering the use of AI

Expected Learning Outcomes and Acquired Competences:

Upon completion of the course, students will be able to:

- Plan organizational development using business process mining and participate in individual tasks.
- Design a data-based business model.
- Critically reflect on the influence of AI systems on the working world

d) Sub-Course: Application - Educational aspects of AI:

Content:

- Adaptive learning system for analyzing learning progress and individually tailored offerings for learning content and for examinations
- Chatbot as virtual tutor and personalized support for challenges in specific learning settings
- Analysis tool for teachers that identifies patterns in learning behavior using AI and thus contributes to the optimization of learning
- Describe individual AI applications in the field of education and explain their influence on the learning environment, teaching methods, and on learners

Expected Learning Outcomes and Acquired Competences:

Upon completion of the course, students will be able to:

- Evaluate adaptive learning systems regarding their functionality and determine their usefulness for the personalization of learning content and examinations
- Assess the possible applications of virtual tutoring systems and reflect on them for solving challenges in specific learning settings
- Use analysis tools that recognize learning behavior with AI and optimize learning processes (including preparation for examinations) based on this