

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Financial and Management Engineering		
LEVEL OF STUDIES	Master's Program		
COURSE CODE	I.3	SEMESTER	A
COURSE TITLE	Technologies and Tools for AI Applications		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, state the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail in section (4).			
COURSE TYPE <i>general background, special background, specialization, general education, skills development</i>	General Background		
PREREQUISITE COURSES	NO		
LANGUAGE OF INSTRUCTION AND OF ASSESSMENT	ENGLISH		
MODE OF TEACHING <i>in-person (%) synchronous distance learning (%) asynchronous distance learning (%) (In the case of synchronous distance learning, the total weekly duration of teaching is recorded)</i>	REMOTELY		
AVAILABILITY TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	https://aisbd.aegean.gr/en/c/technologies-and-tools-ai-applications		

(2) LEARNING OUTCOMES

Learning Outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Brief Guide for drafting Learning Outcomes

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

- Understand how AI technologies transform organizations and enhance business value.
- Evaluate AI and Generative AI applications across different business functions, considering efficiency, value, and limitations.
- Design and develop AI-enabled workflows and automated processes, integrating relevant tools.
- Understand the transition from traditional machine learning models to modern generative and agentic systems.

- Analyze the transformation of roles, tasks, and organizational structures due to AI, distinguishing between automation and augmentation.
- Design and evaluate conversational AI systems by applying principles of user experience, usability, and interaction design.
- Understand how the design and characteristics of AI systems influence user perception, trust, and behavior during interaction.
- Evaluate ethical, governance and risk issues related to the use of AI in organizations and society.
- Synthesize and apply different approaches to using AI in organizations, connecting technology, strategy and human factor

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and are stated below), at which of the following does the course aim?

<i>Search, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>
<i>Adaptability to new situations</i>	<i>Respect for difference and multiculturalism</i>
<i>Decision-making</i>	<i>Respect for the natural environment</i>
<i>Working independently</i>	<i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i>
<i>Team work</i>	<i>Criticism and self-criticism</i>
<i>Working in an international environment</i>	<i>Production of free, creative and inductive thinking</i>
<i>Working in an interdisciplinary environment</i>	<i>.....</i>
<i>Production of new research ideas</i>	<i>Other...</i>
	<i>.....</i>

The course aims to develop the following general competences:

- Analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Teamwork
- Decision-making
- Adaptability to new situations

(3) COURSE SYLLABUS

Week 1

- ⇒ The value and impact of AI
- ⇒ Economic impact and productivity from AI
- ⇒ AI adoption and levels of organizational maturity
- ⇒ The impact of AI at the organizational level

Week 2

- ⇒ From digital transformation to AI-enabled transformation
- ⇒ Digital and AI transformation frameworks
- ⇒ Organizational capabilities and requirements for AI adoption
- ⇒ AI strategy and governance issues

Week 3

- ⇒ AI applications in business functions
- ⇒ AI in Marketing, Sales, and Customer Experience
- ⇒ AI in HR, Finance, and Operations
- ⇒ Mapping Generative AI applications and tools

Week 4

- ⇒ The impact of AI on roles and tasks
- ⇒ Automation vs Augmentation
- ⇒ AI in information systems (ERP, CRM)
- ⇒ Human–AI collaboration

Week 5

- ⇒ Basic concepts of Artificial Intelligence
- ⇒ Data and analytics as the foundation of Machine Learning
- ⇒ Types of learning (supervised, unsupervised) and analysis techniques
- ⇒ Large Language Models (LLMs) and Generative AI

Week 6

- ⇒ Intelligent Automation and Robotic Process Automation
- ⇒ Design of automated processes
- ⇒ Developing workflows using tools (n8n, Make)
- ⇒ Integrating AI into automated systems

Week 7

- ⇒ Human–AI Interaction
- ⇒ Anthropomorphism and AI perception
- ⇒ Trust and user experience
- ⇒ Manipulation and social implications

Week 8

- ⇒ Conversational AI and user experience design
- ⇒ Principles of usability and user experience
- ⇒ Design of conversational systems
- ⇒ Evaluation of AI systems

Week 9

- ⇒ Agentic AI and autonomous systems
- ⇒ From LLMs to agents
- ⇒ Agent architecture and design
- ⇒ Applications of agent-based systems

Week 10

- ⇒ Multi-agent systems
- ⇒ Orchestration and deployment
- ⇒ Governance and control of AI systems
- ⇒ Project presentations

(4) TEACHING AND LEARNING METHODS - ASSESSMENT

MODE OF TEACHING <i>Face-to-face, distance learning, etc.</i>	DISTANCE LEARNING
MODE AND FREQUENCY OF COMMUNICATION WITH THE STUDENTS	● Communication mainly via email and the e-class / e-class platform (announcements, materials, instructions). ● Scheduled weekly office hours for questions (in person or online).
ENSURING THE MODE OF COMMUNICATION AMONG STUDENTS <i>Team assignments and discussions, collaborative learning platforms with the use of AI, video conference, QA sessions, κ.α.</i>	● Ensuring communication between students. ● Group assignments and structured class discussions. ● Use of collaborative digital tools (e.g. shared documents, boards) for teamwork.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	● Use of ICT in teaching. ● Lab exercises for solving complex AI transformation problems in organizations.

Use of ICT in teaching, in laboratory training, in the communication with students	Use of e-class for communication with students and for providing research material for the Strategic Planning project														
TECHNOLOGICAL EQUIPMENT REQUIREMENTS	- Required technological equipment and basic technology skills - Laptop with internet connection (required for practical exercises) - Accounts on platforms such as n8n / Make.com, Voiceflow, ChatGPT, or Claude (free registration) - No programming experience required — use of low-code / no-code tools														
PLAGIARISM POLICY/ PLAGIARISM DETECTION TOOLS	All assignments are submitted through Turnitin and checked for originality. Any form of plagiarism, including the use of material without proper citation, will be addressed in accordance with the Study Regulations. The use of the APA (7th edition) referencing style is mandatory.														
ARTIFICIAL INTELLIGENCE POLICY <i>(1) The use of Artificial Intelligence is prohibited in all circumstances</i> <i>(2) The use of Artificial Intelligence is allowed only with the permission of the instructor</i> <i>(3) The use of Artificial Intelligence is allowed only with an explicit reference to the literature</i> <i>(4) Students are free to use Artificial Intelligence</i>	Any use of AI must be explicitly declared (including the tool used, the method, and the purpose of use). The student remains solely responsible for the accuracy and quality of the submitted work.														
ORGANISATION OF TEACHING <i>The mode and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, work placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artworks, etc.</i> <i>The student's study hours for each learning activity are stated, as well as the hours of independent study, according to the principles of the ECTS.</i>	<table> <tr> <th>Activity</th><th>Semester workload</th></tr> <tr> <td>Attendance and study of lectures</td><td>60</td></tr> <tr> <td>Assignment writing</td><td>40</td></tr> <tr> <td>In-class practical exercises (hands-on)</td><td>20</td></tr> <tr> <td>Assessment questions in each module</td><td>15</td></tr> <tr> <td>Study of additional learning materials (videos, articles, etc.)</td><td>15</td></tr> <tr> <td>Course total</td><td>150</td></tr> </table>	Activity	Semester workload	Attendance and study of lectures	60	Assignment writing	40	In-class practical exercises (hands-on)	20	Assessment questions in each module	15	Study of additional learning materials (videos, articles, etc.)	15	Course total	150
Activity	Semester workload														
Attendance and study of lectures	60														
Assignment writing	40														
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Assessment questions in each module	15														
Study of additional learning materials (videos, articles, etc.)	15														
Course total	150														
STUDENT ASSESSMENT <i>Description of the assessment method</i> <i>Language of assessment, methods of assessment, formative or summative assessment, multiple choice questions test, short answer questions, essay questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory assignment, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	The final grade for the course is determined as follows: Assessment is based on a written final examination at the end of the semester in which the course is taught (60% of the final grade) and a group assignment (40% of the final grade). The evaluation criteria for both the final written examination and the assignment are communicated to students during the first lecture and are also stated in the final examination topics.														

(5) RECOMMENDED BIBLIOGRAPHY

- *Suggested bibliography:*

1. E. Turban, C. Pollard, G. Wood (2021) Information Technology for Management: Driving digital transformation to increase local and global performance, growth and sustainability, 12th Edition, 2021, John Wiley
2. Norvig, P., & Russell, S. (2021). *Artificial Intelligence* (4th ed., trans. P. Kanavos). Kleidarithmos Publications.
3. Selected articles and case studies
4. Instructor's notes

- *Related academic journals:*

MIS Quarterly, MIS Quarterly Executive, European Journal of Information Systems, Journal of the Association for Information Systems, Information Systems Research, Information Systems Frontiers