UNIVERSITY OF WEST ATTICA

Department of Informatics and Computer Engineering

Course: **E-Learning**

Dismissal Work for the academic year 2023-2024

Work Topic

The topic of the work includes:

1. **Theoretical part:** Analysis of a topic in the research field of E-Learning (from the available topics) and
2. **Practical part:** Development of a relevant application or use of a tool for a relevant application.

Theoretical Part:

Available topics:

No.	Topics	Information about the theoretical part
1	Teaching Methodology and Modern Educational Trends	Introduction to Teaching Methodology: An overview of the basic theory and practice of teaching methodology. Contemporary Educational Trends: An analysis of current trends and practices in the field of education, including topics such as adaptive learning, personalized learning, and educational technology. Teaching Methodologies: Presentation of various teaching methodologies such as: Expository learning, Discovery learning, Collaborative learning, Problem-based learning, etc. Technology in Teaching: Description of the latest developments in the use of technology in teaching, including tools such as online courses, multimedia, and educational software. Practical Applications: Presentation of practical examples and case studies that apply modern teaching methods and technologies in education.
2.	Learning Theories and Pedagogical Strategies	Introduction to basic learning theories: Include descriptions and explanations of classic learning theories, such as: Symbolic Interactionism, Social Constructivism, Behaviorism, Social Recognition Theory, Cognitivism, etc. Pedagogical Strategies: Describe various pedagogical strategies based on these theories, such as Scenario-Based Teaching, Learning Through Play, etc.

		Applications and tools: Mention specific tools and techniques that can be used to implement these strategies, such as educational electronic games, interactive learning environments, applications based on autonomous learning, etc. Presentation of examples of applying learning theories in educational practice
3.	Instructional Design with Digital Technologies	Introduction to instructional design and the use of digital technologies in education. Strategies for planning learning activities using digital tools. Implementing interactive teaching scenarios with technology Presentation of learning activity design techniques using digital applications
4. Creation of	interactive educational materials	Development of interactive educational resources and materials Design and implementation of gamified and interactive online learning environments Evaluation of the effectiveness and usefulness of interactive educational materials
5.	Supervisory Media & New Technologies in Teaching Approaches	Introduction to the use of supervisory tools and new technologies in teaching. Display and feedback technologies, such as overhead projectors, interactive whiteboards, etc. Application of new technologies in teaching practice Evaluation of the use of supervisory tools and technologies in the educational process Identifying the advantages and challenges of using new technologies in teaching
6.	Collaborative Learning and Web 2.0 Tools in Education	Introduction to collaborative learning and the use of Web 2.0 tools in educational practice. Theoretical analysis of collaborative learning, including theories of the social construction of knowledge and social interaction. Practical applications of collaborative learning at various levels of the educational process, such as collaborative project development and problem solving in groups. Implementation of Web 2.0 tools to support collaborative learning. Analysis of advantages and challenges related to the use of Web 2.0 tools in collaborative learning. (Examples of Web 2.0 Tools: Social networking platforms like Facebook and X, Collaborative document editing tools like Google Docs and Microsoft OneDrive, Project management platforms and collaborative programming tools like Trello and GitHub, etc.)

7.	Educational Assessment with digital technologies	Introduction to educational assessment and the use of digital technologies to assess learning. Methods and tools for negotiating and developing digital assessments, including online tests, electronic feedback, and algorithm-based assessments. Applications of educational assessment in various areas of education, such as online learning, personalized learning and open interactive learning spaces. Analysis of advantages and challenges related to the application of digital technologies in educational assessment. (Examples of assessment tools based on online platforms: Kahoot, Quizizz, etc.)
8. Learning	Management Systems and Content Management Systems	Introduction to Learning Management Systems (LMS) and Content Management Systems (CMS), including their basic operating principles and main features. Analysis of the capabilities offered by LMS and CMS for the management, organization and delivery of educational content. Applications of LMS and CMS in various areas of education, such as online learning, business training and the development of electronic educational material resources. Selection and evaluation of the appropriate LMS and CMS for the needs of educational organizations. Examples of Learning Management Systems: Open eClass, Moodle, Blackboard, Canvas, etc. Examples of Content Management Systems: WordPress, Joomla, Drupal, etc. Examples of Content Development Tools: Adobe Captivate, Articulate Storyline, Camtasia, etc.
9.	Open educational resources and digital repositories	Introduction to the concept of open educational resources (OER) and digital repositories. Analysis of the benefits and challenges associated with the use of OER in the education sector. Examination of the different types of repositories that provide access to OER, such as thematic repositories, formatting platforms, and online content sharing communities. Guidelines for searching, evaluating and using OER in an educational context. Promoting the creation, dissemination and integration of OER in the educational process. Examples: OpenStax, MERLOT (Multimedia Educational Resource for Learning and Online Teaching), European Open Education Portal
10. Massive Open Online	Courses	Introduction to the concept of Massive Open Online Courses (MOOCs) and their importance in modern education. Analysis of the structure and characteristics of MOOCs, including delivery methods, interactive elements and assessment procedures.

		Analysis of the challenges and benefits associated with using MOOCs for learning and teaching.
		Guidelines for designing, developing and implementing a MOOC.
		Analysis of advanced technologies and methods that can be used to improve the educational experience in a MOOC.
		Examples: Coursera, edX, FutureLearn, etc.
11. Design and Development of digital learning environments and educational software applications		Introduction to the concept of software design and development for educational purposes.
		Analysis of user requirements and needs for the design of a digital educational environment.
		Design of the structure and functions of the software, including the user interface, interactive elements and functionality.
		Software development using appropriate programming languages and development tools.
		Testing and evaluating software to ensure its quality and functionality.
		Examples of tools that can be used to create digital educational applications: Adobe Captivate, Articulate Storyline, Scratch, etc.
12. Virtual and Augmented Reality in Education		Introduction to the concepts of virtual and augmented reality.
		Applications of virtual and augmented reality in education, including virtual educational environments and interactive learning applications.
		The challenges and possibilities of using virtual and augmented reality in the educational process.
		Methods for designing and developing educational content based on virtual and augmented reality.
		The impacts of virtual and augmented reality on learning, teaching and assessment.
		Examples of tools for creating educational content based on virtual and augmented reality include: Unity, ARToolKit, Vuforia, CoSpaces Edu, BlippAR
13. Digital Games in Education		Introduction to the use of digital games as an educational tool.
		The pedagogical principles behind the use of digital games in education.
		The different types of digital games and how they can be integrated into learning.
		Approaches to designing digital games for educational purposes.
		The effects of using digital games on learning and skill acquisition.
		Examples of tools for creating digital games in education include: Minecraft, etc.

14. Educational Data Mining and Learning Analytics	Introduction to the concept of data mining and learning analytics. Data mining methods applied in the education sector, such as classification, clustering and predictions. Use of various tools and techniques to collect, store and process educational data. Analysis of challenges and prospects in the field of learning analytics in education. Examples of tools that can be used for educational data mining and learning analytics: Google Analytics, Tableau, RapidMiner, Moodle Learning Analytics, etc.
15. Artificial Intelligence in Education	Introduction to artificial intelligence and its application in the field of education. Using artificial intelligence for individualization of education and adaptive learning. Analysis of problems that can be solved using artificial intelligence in the educational field. Applications of artificial intelligence at different levels of education, such as preschool, primary, secondary and higher education. Examples: TensorFlow, Keras, Scikit-learn, PyTorch, etc.

Important information:

- The work can be done either *individually* or in groups of *two (2) people.*

- The work must be at least **30 pages** (excluding the cover, appendices, reports and the presentation of the application).

- The font you should use is **Times New Roman.** • The font size should be **12pt.** • The line spacing should be **single.**

- The submission of the work must be in **word.** • For your work, it is mandatory to use **references** for any text or image you use. References must be at the end of the text in APA style, as well as indicating the parts related to the text [e.g. *E-Learning is defined as the use of electronic media, educational technologies and information and communication technologies in education.*

  (Krouska, Troussas, 2024), citing the authors and the publication date of the article or book]. Attention! **We do not copy** text, but write it in our own words, always citing the source.

- The **tables** and **figures** you will use in your work must be in **Greek** and created in **Word** (not screenshots or images from other sources). Since the tables and figures come from sources, you must have made some changes to them so that they are not considered plagiarism by Turnitin.

- Assignments will be checked for possible plagiarism through **Turnitin,** upon submission to eClass (Copied assignment means zeroing in the course).

• You can **enrich** the proposed sections (including adding new ones), but under no circumstances can you skip them.

When prompted, you will identify your groups in eClass. Then, the topics will be activated in eClass, and you will need to indicate which topic you will be doing using a FIFO system.

Practical part:

For the practical part of the assignment, you are invited to use a tool that corresponds to your topic and create a scenario based on it or implement a small-scale application with free themes on the corresponding topic.

You should present your application with detailed screenshots, explanations and code presentation (if available).