

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS  
DEPARTMENT OF INFORMATICS

**Multimedia Technology**

**7<sup>th</sup> Semester Undergraduate Option  
Fall Semester, 2024-2025**

**Synopsis:** Introduction to digital media and multimedia technologies and applications, with an emphasis on multimedia on the World Wide Web and multimedia communications on the Internet.

**Learning Objectives:** Understanding the goals and peculiarities of multimedia technologies and systems (including human factors). Development of the ability to analyze, design and implement multimedia systems. Development of the capability to model and analyze the performance of multimedia systems.

**Instructor:** George Xylomenos, Professor (xgeorge AT aueb.gr). Office Hours: Monday 14:00-15:00, Friday 15:00-16:00. (K106 – Main Building, 1<sup>st</sup> floor).

**Assistant:** Chalima Dimitra Nassar Kyriakidou, Ph.D. Candidate (dnassar AT aueb.gr).

**Lectures:** Monday 15:00-17:00 (A22), Friday 15:00-17:00 (A25).

**Tutorials:** Friday 17:00-19:00 (A32).

**Prerequisites:** Elements of computer systems organization, operating systems, computer networks and probability.

**Assignments:** The class involves a **required** programming project. The projects will be completed in groups and will contribute 40% to the final grade. The assignment topics will be proposed by the instructors and will be customized by the students/groups.

**Grading:** The final grade of the class will be calculated as follows:

40% programming project

60% final written exam

If the grade in the final written exam is less than 50% (less than 3 out of 6), the final grade will be the exam score (that is, the programming project's grade will not be added). The project must be completed before the end of the semester, but project grades will also be valid for the makeup exams in September. Please note that the project is **mandatory** and must be presented in class by each group on an assigned date. If the project is not submitted and presented in class, there will be no class grade.

**Course Syllabus:** Introduction, relationship with other knowledge areas, trends. Multimedia applications and systems. Media types and their properties. Data streams, media and multimedia. Audio, image and video. Elements of information theory. Data encoding and compression. Compression standards: JPEG, MPEG (-1, -2, -4), H.264, MP3, AAC. Multimedia topics in communications networks and the World Wide Web. Multimedia communication with multiple recipients. Video conference. Synchronization. Media streaming, media servers, RTP and RTSP protocols, IPTV, MPEG-DASH. Quality of service with and without specialized network support.

**Electronic announcements:** Class announcements, presentations and any other auxiliary materials will be uploaded to E-Class (<http://eclass.aueb.gr/>). It is recommended to register

for the course in E-Class (<https://eclass.aueb.gr/modules/announcements/?course=INF179>) so that you may receive announcements by email.

**Books and Reading Material:** For Greek students, two books are available:

- Γ. Ξυλωμένος και Γ. Πολύζος, *Τεχνολογία Πολυμέσων και Πολυμεσικές Επικοινωνίες*, Εκδόσεις Κλειδάριθμος, 2009.
- Α. Σ. Πομπορτσής, Σ. Ν. Δημητριάδης, Ε. Γ. Τριανταφύλλου, *Τεχνολογία Πολυμέσων*, Εκδόσεις Τζιόλα, 2003.

For further study, the following books are recommended:

- Z.N. Li and M.S. Drew, *Fundamentals of Multimedia*, 3rd edition, Springer, 2021.
- C. Steinmetz, K. Nahrstedt, *Multimedia Fundamentals, Volume 1: Media Coding and Content Processing*, Prentice Hall, 2nd edition, 2002. (also available in Greek: C. Steinmetz, K. Nahrstedt, *Πολυμέσα: Θεωρία και Πράξη*, Εκδόσεις Μ. Γκιούρδα, 2002.)
- R. Steinmetz and K. Nahrstedt, *Multimedia Applications*, Springer-Verlag, 2011.
- R. Steinmetz and K. Nahrstedt, *Multimedia Systems*, Springer-Verlag, 2010.