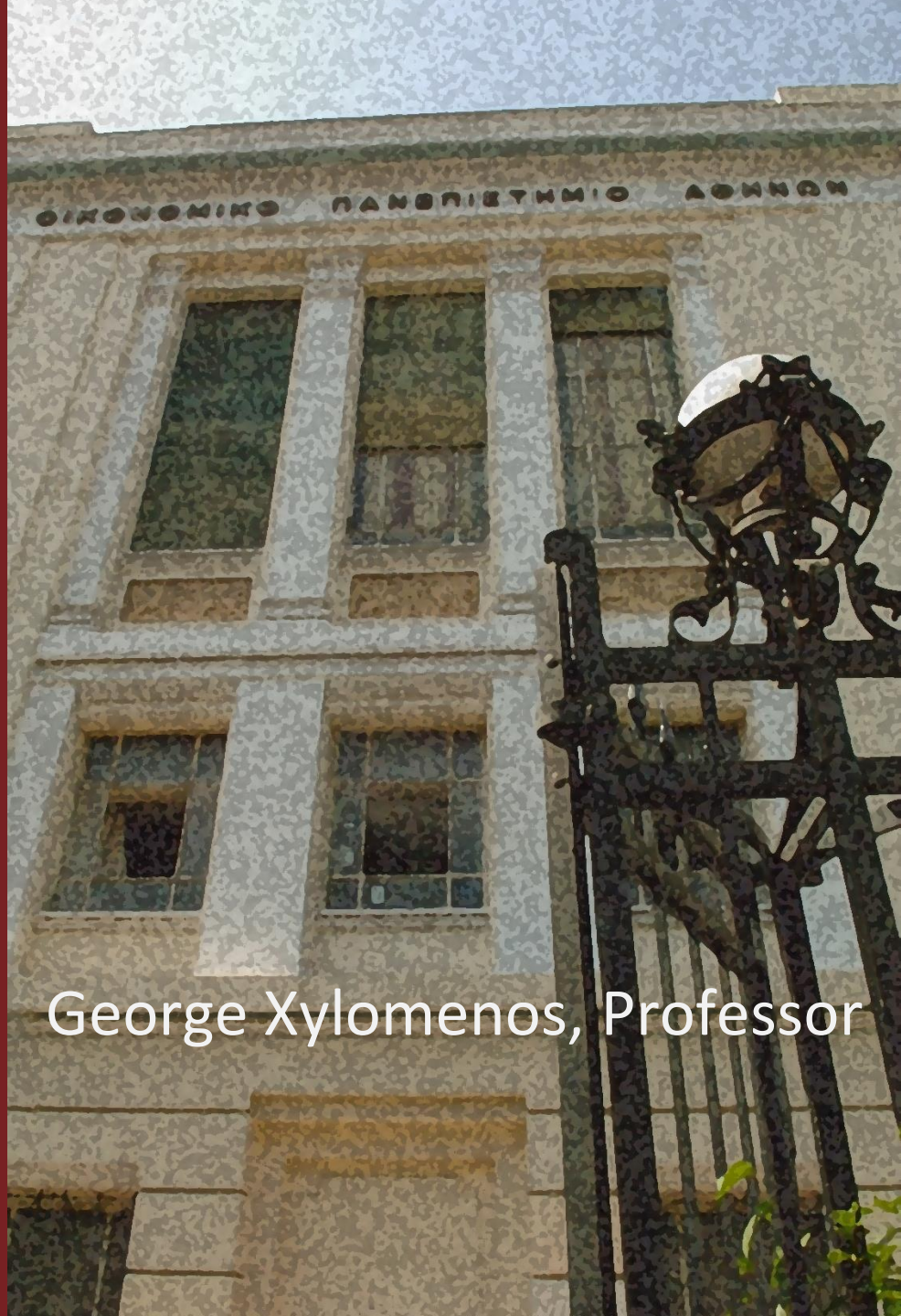
ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

Multimedia Technology 2024-2025



George Xylomenos, Professor

Part One

CLASS DETAILS

First things first

- This is a (real) Erasmus course
  - Taught in English (Lectures / Sections)
  - Materials in English (also available in Greek)
  - Projects in English (they always were)
  - Exams in English or Greek (take your pick)

Class goals

- Understand the nature of media
  - The analog world
- Learn how they are represented
  - The digital world
- Understand how coding works (in practice)
- Learn about advanced networking for media

Prerequisites

- Computer Systems Organization
  - Or Computer Architecture (names vary)
- Operating Systems
- Computer Networks
- (Basic) Probability
- Passable English!

Classes

- Instructor: George Xylomenos, Professor (xgeorge AT aueb.gr)
- 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)

Projects

- Class project: Group project, 40% of grade
  - Two to three people per group (not strict)
  - Due at end of classes
  - Every group must present it in class
    - Will do it remotely, for practical reasons
- We'll provide the topics
  - And you'll customize them

Project Topics

- Some topics from last year
  - Analog audio synth with Jsyn
  - Drum machine with Web Audio
  - Conference app with WebRTC
  - Game app with p5.js
  - Game app with Unity
  - Game app with Godot

Exams

- Final exam: 60% of grade
  - Will cover the entire course
  - Need to achieve 3 out of 6
    - Otherwise, project does not count
  - Project is compulsory
    - Otherwise, you will not receive a grade

Project Grading Notes

- What is considered?
  - The quality of the final product
  - The quality of the presentation
  - The contributions of the team
    - Where you started from, how far you got
  - The number of team members
  - The project report
    - Documentation and build instructions

Exam Grading Notes

- Exercises
  - This is what we do in the tutorials
  - You need some practice to solve them
  - About two thirds of the grade
- Theory
  - Obviously, we do not ask what is in the slides!
  - You need to understand the options available
  - Sample questions at the end of every class

Bibliography (Greek)

- For Greek Students:
  - Γ. Ξυλωμένος και Γ. Πολύζος, Multimedia Technology και Πολυμεσικές Επικοινωνίες, Κλειδάριθμος, 2009.
  - Α. Σ. Πομπορτσής, Σ. Ν. Δημητριάδης, Ε. Γ. Τριανταφύλλου, Multimedia Technology, Εκδόσεις Τζιόλα, 2003.

Bibliography (English)

- For everyone
  - 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. R.
  - Steinmetz and K. Nahrstedt, Multimedia Applications, Springer-Verlag, 2011.
  - R. Steinmetz and K. Nahrstedt, Multimedia Systems, Springer-Verlag, 2010.

Course contents (1 of 3)

- Part 1 Intro
  - Intro to Multimedia
  - Multimedia Applications
  - Multimedia Systems
- Part 2 Coding
  - Information Theory
  - Coding Principles
  - Entropy Coding

Course contents (2 of 3)

- Part 3 Audio
  - Vocoders
  - Perceptual coding
- Part 4 Images
  - JPEG coding
- Part 5 Video
  - The H.261/3/4 standards
  - The MPEG-1/2/4 standards

Course contents (3 of 3)

- Part 6 Networking
  - Multicasting
  - Best effort services
  - Guaranteed quality of service
  - IPTV
  - Media Streaming
  - Teleconferencing
  - Multimedia Synchronization

Part Two

SURVIVAL GUIDE REDUX

Orientation

- What am I doing here?
  - In Informatics
  - At AUEB
  - In the Multimedia Technology class
- How will I do well (in the future)?
  - In the Multimedia Technology class
  - At AUEB
  - In Informatics

What am I doing in Informatics?

- So far you have seen many things
  - Computing has many facets
    - Theory - practice continuum
  - Have you found something you like?
  - Were the courses you took helpful?
  - What are you still missing?
  - What else can you gain?

What am I doing at AUEB?

- People are the key in any organization
  - Did you meet the right people?
  - Did you ask your instructors for guidance?
  - Did you complete any worthwhile projects?
  - Are you going to do an internship?
  - Are you going to do a diploma thesis?
  - Will you be needing recommendations?

What about Multimedia Technology?

- Our senses are analog
- Media representations are digital
- Coding is a compromise
  - Quality – Performance
- Networking is key
  - Advanced networks
  - Custom protocols / functions

How will I do well in Multimedia Technology?

- The exams are open book
  - So: no need for details, understand concepts
  - What are the trade-offs?
- Come up with a good project!
  - Project topics are customizable
  - Create something that you like
  - Make it part of your portfolio

How will I do well at AUEB?

- It is (relatively) late to change course
  - Fine tune your course choices
  - Deepen your knowledge
- Think about your future
  - Advanced courses are very important
  - Try to improve your grades
  - There's always purgatory (grad school)

How will I do well in Informatics?

- There is not (much) BS in computing
  - Grades and degrees are not enough
  - You must be able to support them
- Now it’s the time to learn some tools
- Computing is an international profession
  - You just need to speak English
  - And know what you're doing!