Course Title & Identity

- Title: **Embedded Systems**
- Objectives: Extensive training on applied industrial-strength R&D related to:
  - proposing, evaluating and integrating innovative system-level design methodology concepts and tools in commercial products,
  - participating in standardization & IPR efforts,
  - developing and validating hw/sw IP (sometimes open source), and
  - implementing FPGA prototype platforms.
- Focus: Computer Engineering
- Staff
  - Miltos Grammatikakis (System-Level Design and SystemC)
  - George Kornaros (Architecture and H/W Design)

{mdgramma, kornaros}@cs.hmu.gr

Class Modules

System-Level Design

- System-Level Methodology
- SystemC
- Special Topics
  - Mapping
  - Dynamic Power Estimation
  - IP Reuse
  - Co-design and RTOS
  - Fault Tolerance & Reliability

EDA Principles & Design

- ES Principles, Methodologies and Design Tools
- VHDL
- ES Design with EDK (Xilinx)
- IP design with EDK (Xilinx)
- Embedded Software (Xilinx)
- High-Level Synthesis (Xilinx)

Embedded/Multicore Platforms & Applications

- Cyber-Physical Systems (Automotive, Healthcare)
  - Security vs Safety
  - Performance, Real-Time
  - Energy Optimization Studies

Teaching Approach

- Three hours lecture/discussion per week
- Laboratory: technical support of projects
- Grading (work involves any of the modules)

  Programming Project (up to 100%)

  OR

  Survey (up to 80%)

- Projects require studs to act as researchers, architects, hardware designers, system and application service developers or CAD engineers

Student Profile

- **Desired prerequisites (or interest)**
  - computer architecture
  - operating systems, security
  - embedded systems, real-time systems, parallel/distributed systems
  - systems and network programming
- **Programming experience**
  - software engineering (C/C++ and Linux, Python)
  - computer engineering (VHDL, Verilog)
- **Expected weekly workload**
  - average ~10 hours/week, incl. classes
  - depends on project choice (programming or survey)
  - skewed towards mid & end of semester