**Democritus University of Thrace, Kavala, Greece**
School of Science
Department of Informatics

**Department of European and International Programmes – Erasmus+**
Agios Loukas, 654 04, Kavala University Campus, Greece
0030-2510-462221 & -290 & -308

## Proposed Course for incoming Erasmus students[1]

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| Responsible for the course (lecturer) (name, phone number, e-mail address) | Assist. Professor Dimitris Karampatzakis 0030 2510 462 612 dkara@cs.duth.gr |
| Title of the Course | **Embedded Systems** |
| ECTS credits | 5 |
| Short contents of the course | Upon successful completion of the course, students should be able to: 1. To know the ways of using the materials used in the design of analog electronics of an integrated system, such as resistors, capacitors, coils, diodes, transistors, relays, operational amplifiers and timers. 2. To know the ways of using the materials used in the design of digital electronics of an integrated system, such as logic gates, encoders, decoders, multiplexers, decoders, digital comparators, flip-flops, counters and registers. 3. To know the architecture with which a RAM memory and a ROM memory are structured. 4. To understand the concepts and architectures of the following units of the microcontroller: 1. control unit, 2. microprocessor, 3. memory, 4. input unit and 5. output unit. 5. To specialize their knowledge in the architectural structure of a microcontroller (ARM or AVR or RISCV). 6. To understand and use the way of writing instructions in Python or C language. 7. Know and be able to use the methodology and tools used to program a microprocessor in Python or C language. 8. To know how to program, in Python or C language, the ARM RP2040 or Atmega8515 microcontroller. 9. Know how to design and develop a complete integrated system. 10. To get to know the SysML language for modeling complex systems that have characteristics of embedded systems and Internet of Things systems. 11. To know industrial systems of embedded systems. |
| Aim of the course and target audience | • The course will introduce students to Embedded Systems and will create practical skills in embedded systems applications using RP2040 processor and python. • Target audience: Undergraduate students of Informatics/ Computer Science / Electrical - Electronics Engineering / Physics |
| Teaching Methods duration and Evaluation | Lectures: 26 hours Labs: 13 hours  Evaluation: 100% Individual AND/OR Group Assignments |
| Offered Period | Spring semester |

| Indicative bibliography | • MicroPython Projects: A do-it-yourself guide for embedded developers to build a range of applications using Python, Jacob Beningo, Packt, 2020<br>• Designing Embedded Systems and the Internet of Things (IoT) with the Arm® Mbed, Xiao, Wiley UBCM ebooks, 2018<br>• MicroPython for the Internet of Things, Charles Bell, Apress, 2017 |
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[1] Could be easily used and offered for TS movement to our Erasmus partners