PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING
ABET COURSE SYLLABI

IEE2743 MICROCOMPUTERS

Credits and contact hours: 10 UC credits/10 hours (3 Lecture hours per week ; 3 lab session hours and 4 hours of Independent learning experience per week)

Instructor's name: Ricardo Tepper

Course coordinator's name To be defined

Textbook: Datasheets, Reference Manuals and Applications Guide from Microchip Technology Inc.

Course Catalog Description: Microcomputers and microcontrollers, architectures, functional blocks and operation. Memory devices, connection buses and interfacing devices. Peripherals and programming. The student must develop an advanced circuit based on a 32-bit microcontroller and programmed on C language using extensions, intended to control some hardware. The design requires the use of the proper tools for programming and debugging.

Prerequisite Courses: IEE2783 Digital Systems Laboratory

Co-requisite Courses: To be defined

Status in the Curriculum: Elective

Course Learning Outcomes:

1. To understand the functionality of blocks in a microcomputer or microcontroller.
2. To design complex applications, use the integrated ports and extend the hardware capabilities by adding elements and interfaces.
3. To develop real-time applications including interrupt requests and priority control.

Relation of Course to ABET Criteria:

a. Knowledge of mathematics, science and engineering
b. Design and conduct experiments: analyze and interpret data
c. Design a system, component, or process
e. Identify, formulate, and solve engineering problems
g. Effective communication
i. Recognition of the need for, and an ability to engage in life-long learning
j. Knowledge of contemporary issues
k. Techniques, skills, and modern tools for engineering practice.

Topics covered:

1. Hardware blocks and operation.
   CPU: control logic, registers, ALU, FPU, Clock
   Memory: static, dynamic, non-volatile, volatile
   I/O: peripherals and communication
   Buses: internal, external, uni- and bi-directional
   Interrupts: priorities, real-time operation
2. Architecture comparison: von Neumann, Harvard; RISC vs. CISC
3. Software layers: BIOS, drivers, kernel, OS, applications
4. Use of the MPLABX IDE