Course Syllabus

INTRODUCTION TO EMBEDDED SYSTEMS

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Program: Computer Science

1. Course number and name

CCPG1029 - INTRODUCTION TO EMBEDDED SYSTEMS

2. Credits and contact hours

3 credits and 3 contact hours

3. Instructor's course or coordinator's name

FEDERICO XAVIER DOMINGUEZ BONINI

4. Text book, tittle, author, and year

• Williams, Elliot. MakeAVR programming (First edition., First release.;)

a.Other supplemental materials

• Russell, David W. & Thornton, Mitchell Aaron. Introduction to Embedded Systems: Using ANSI C and the Arduino Development Environment (Synthesis Lectures on Digital Circuits and Systems) (Paperback; 2010-07-12)

5. Specific course information

a. Brief description of the content of the course (catalog description)

This course covers an introduction to embedded systems from a computational context with emphasis on the basic integration of hardware and software systems. The course focuses on the different embedded operating systems, the basic manipulation of electronic components, the interface with actuators and analog/digital sensors, the use of basic control algorithms, wireless communication technologies, and finally applications using open source operating systems such as Linux.

b. This course is: Selected elective

6. Specific goals for the course

a. Specific outcomes of instruction

1.- The student will be able to integrate hardware systems using basic electrical and electronic components for the safe and optimal implementation of an embedded system.

2.- The student will be able to program simple software / hardware interfaces using high-level programming languages for effective and safe interaction with sensors and actuators.

3.- The student will be able to program basic control algorithms using high-level programming languages for effective management of actuators.

4.- The student will be able to choose the appropriate wireless communication technology in devices with low computational resources for their integration in embedded embedded systems.

b. Explicity indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

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7. Brief list of topics to be covered

1.- Embedded operating systems

2.- Basic handling of electrical and electronic components

3.- Interface with actuators, and analog/digital sensors

4.- Use of basic control algorithms

5.- Applications in embedded operating systems based on Linux

6.- Applications of wireless communication systems