

**UNC - Charlotte, Department of Electrical and Computer Eng.**  
**Project Ideas for ECGR 5101/6090 Embedded Systems – Fall 2004**

Version 1.0 – October 4, 2004

It is expected that students registered for 5101 and 6090 will do an additional project, the scope of which is agreed-upon by the instructor. Some areas include:

- Stiquito Controller board programming using TI chip and tools:
  - The MSP430-based board has a prototype area. Add a device to expand the robot's capability:
    - § AM radio chip
    - § IR transmitter/receiver
    - § Mini-camera/CCD chip
    - § Ultrasound sensor
  - Create an automated “bed of nails” tester for the Stiquito controller board. (see the link <http://www.coe.uncc.edu/~jmconrad/ECGR6090-2004-01/notes.html> in the advanced embedded systems course for more detail on a tester).
  - Use a Stiquito controller board (but not the bug robot) to make a small wheeled robot. Program it to follow light.
- Stiquito Controller board using an Atmel chip and ORCAD/Mentor Graphics tools. The board has been designed and some code suggested. Finish this project by manufacturing the board, populating the board, and downloading code to the board to ensure it works correctly.
- Stiquito Controller board using a Renesas chip and ORCAD/Mentor Graphics tools. The board has been designed and some code suggested. Finish this project by manufacturing the board, populating the board, and downloading code to the board to ensure it works correctly.
- Converting class note chapters to an Atmel board.
- Choose a sensor or actuator and attach it to the Renesas development board. Create a lab that uses it.
- Learn about the Embedded Linux operating system. Port the OS to the Renesas board, and create a lab exercise that investigates Embedded Linux.
- Assist in the development of an Embedded Systems text book (i.e. written materials search and summation of the papers/books of each particular topic) early to late semester project.

The deliverables include:

- October 8: A one-page write-up on the proposed work. You should talk to the instructor BEFORE you decide on a project. You will be graded on content and proper use of English. (20 points)
- November 12: A report on initial activity of the project, including biographical references, code listing, designs, etc. You will be graded on content and proper use of English. You also will be graded on content and progress made (40 points)

- December 10: A final report on activity of the project, including biographical references, code listing, designs, etc. You will be graded on content and proper use of English. (40 points)
- The end-results of the project will be graded as follows:
  - **Value to the professor of the work:** 20 points
  - Completeness of the activity – adherence to the plan: 60 points (ECGR5101), 80 points (ECGR6090)
  - Quality of the work: 20 points
  - Level of difficulty – appropriate for the number of participants and the level of graduate credit: 30 points (ECGR6090)