

Valencia College Course Syllabus Spring 2016

COP 2930 Selected Topics – Embedded Computing CRN 17454 3 Credit Hours

Instructor: Gerald (Jerry) Reed

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Email: Please post in the Questions and Answers forum within Blackboard
For private messages, you may use: greed9@valenciacollege.edu

The work you will perform in the class is:

- Class Project assignments
- Individual Projects you choose
- Final Examination

(All assignments must be turned in via Blackboard submission)

Attendance: This class meets only once per week. Since this is a small, class which is rather like an independent study, we may not meet every week face-to-face and we may communicate informally at other times via Blackboard, e-mail, phone and Google Plus.

Course Description:

From *Wikipedia*:

An **embedded system** is a [computer system](#) with a dedicated function within a larger mechanical or electrical system, often with [real-time computing](#) constraints. It is *embedded* as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today. 98 percent of all [microprocessors](#) being manufactured are used in embedded systems.

https://en.wikipedia.org/wiki/Embedded_system

Tools:

You may use your choice of many freely-available hardware and programming environments. These include:

Arduino <http://www.arduino.cc/>

Raspberry Pi: <https://www.raspberrypi.org/>

Each of these platforms and tools is appropriate for particular problems and situations. The Arduino is usually programmed in C/C++, while the Raspberry Pi offers literally dozens of language possibilities.

Quite conceivably, other platforms, including the boards from Texas Instruments programmed with Energia:

<http://energia.nu/>

and the Parallax Propeller can be used as well.

<https://www.parallax.com/catalog/microcontrollers/propeller>

Goals and Outcomes:

This course directly addresses several skills and competencies from the CLAST and Valencia outcomes, including but not limited to:

“Analyze data, ideas, patterns, principles, perspectives”,
“Employ methods of communication appropriate to your audience and purpose” and
“Implement effective problem-solving, decision-making, and goal-setting strategies”.

Reading skills and logical reasoning skills are also emphasized.

My primary goal is to help you learn to apply a knowledge of hardware and software to creative projects of your own choosing.

Learning Outcomes

A number of specific learning outcomes, things you should be able to do after completing this class, are included in a separate posting withing Blackboard. Please see the Learning Outcomes in the Start Here section of our Blackboard class.

Textbook

There is no required textbook for this class.

Because there is so much excellent material on the web about Embedded Computing, we'll be reading a lot of materials from the Internet. (There are many, many books on programming and on the particular microcontrollers we'll be using. You may be able to use these in addition to or in lieu of the web links).

Grading

Your course grade will be based on a combination of quizzes, examinations, projects, and class participation, in the following proportions:

Final Examination/Presentation	20%
Class Project	30%
Individual Projects:	50%

The grading scale is:

90% to 100%	A
80% to 89%	B
70% to 79%	C
60% to 69%	D
Less than 60%	F

General plan of the course**Course activities***Class Projects*

The class project is currently TBD. I'd like to run some ideas past you and see what you think. It might involve the campus Bat House, or perhaps some other application. Your suggestions are very welcome.

Individual Projects

The other sort of project is an individual one. This is where you can exercise a lot of control and choice to build what you want to build, within the limits of budget and practicality, for instance.

For ideas about the sort of things you might build, please see the following links:

<http://www.instructables.com/id/Arduino-Projects/>

<http://blog.makezine.com/arduino/>

<http://www.adafruit.com/blog/category/projects/>

or just Google “Arduino project” and see what comes up. I'm open to your creative ideas and suggestions here. I'll show a few of the things I've done as a starting point as well.

Postings

There is a wealth of information about Embedded Programming techniques and projects on the Internet. In fact, the main problem is to sort through all the links you will find to locate what you really need. Periodically, your instructor may require that you provide material for selected discussion topics and that you respond to what other students post. A rubric will be provided for scoring your postings and replies.

Hands-On approach.

Program design, and programmatic thinking, as taught in this class are critical to success in a programming career. But programming must be experienced to be fully appreciated. You will be expected to spend significant time outside of class on the team and individual projects. *Ideally these projects will be so much fun that you will not regret the time required.*

Exam

You must take the final in order to pass the class -- this is my policy. The final exam will be comprehensive, but it may also be an informal presentation of the class project and/or your individual project. The audience for this may include other students and faculty.

Policies:

You are expected to abide by the college rules with respect to the integrity of your own work and with regard to plagiarism or cheating. By way of clarification: working together on a project, or asking other students questions about the assignments or programming in general IS NOT cheating, and is welcome and encouraged. Turning in someone else's work as your own, or providing someone else with your completed work, IS cheating.

Makeup exams or alternative testing arrangements must be negotiated with the instructor in advance of the exam dates, except for true emergency situations.

Late assignments may be subject to a reduction in credit, as explained above.

Students with continued, and unexplained absences are subject to withdrawal according to college policies.

Course Policies and College Policies.

Withdrawal: Participation will be monitored, and this information is used in part to determine whether or not you must repay some financial aid and whether or not you will pay the full cost of tuition if you withdraw from the course more than once. It is your responsibility to fill out the necessary withdrawal forms to receive a grade of W. A student is not permitted to withdraw after the withdrawal deadline (3/22/2013). Do not assume that I will automatically withdraw you if you simply stop attending class. However, I am required to withdraw any student who has not attended class or made contact with me to makeup class activities prior to the "no show" period of January 16 to January 25. Student must withdraw/drop the class during Add/Drop in order to receive a refund.

Conduct: Valencia is dedicated not only to the advancement of knowledge and learning but is concerned with the development of responsible personal and social conduct. By enrolling at Valencia, a student assumes the responsibility for becoming familiar with and abiding by the general rules of conduct. If a student engages in any prohibited or unlawful acts that result in disruption of a class, I may withdraw you from the class, and follow up with disciplinary action as appropriate. You will find the Student Code of Conduct in the Current Valencia Student Handbook and the in the Valencia Policy Manual (valenciacollege.edu/generalcounsel/policy).

Make-up exams. Most quizzes will be open for at least a week in Blackboard. If you cannot complete a quiz before it closes, you must get in touch with me. Make-up exams may well contain more essay/short response questions than the on-line exam. Make-ups for postings and discussions may be different from the activity for those who participated during the time that the topic was open.

Cheating and other academic policies: For some activities, you are allowed, even encouraged, to gather information and discuss an assignment with others. You are responsible for giving credit to your sources; otherwise, you are plagiarizing the work of

others. Some assignments such as tests, will be designated to be your work only, and you may not seek assistance from nor supply assistance to, others – that will be regarded as cheating. If you are not sure about the circumstances, please ask me to clarify the situation. Evidence of cheating will result in a F grade. Academic policies are addressed in the catalog and Valencia Policy Manual.

Special Needs: Per college policy “Students with disabilities who qualify for academic accommodations must provide a notification from the Office for Students with Disabilities (OSD) and discuss specific needs with their instructor, preferably during the first two weeks of class. The OSD determines accommodations based on appropriate documentation of disabilities.”

Support for Student Learning:

Valencia College provides considerable services to support your college experience, including tutoring, financial aid, writing centers and many others. If you are having problems dealing with the stress of classes, work and/or family life, feeling depressed, for example, Valencia has contracted with a private and confidential counseling service to assist you. BayCare Behavioral Health Student Assistance program (SAP) services are free to all Valencia students and available 24 hours a day by calling (800) 878-5470. Free face-to-face counseling is also available (as described in the online college catalog).

Disclaimer Statement:

The information presented in this syllabus may be modified as required by the instructor. Students will be notified of any modifications in writing.
