

**University of Massachusetts Amherst
College of Engineering
Department of Electrical and Computer Engineering**

**ECE 231, Introduction to Embedded Systems
Spring 2019**

Tentative Syllabus

Instructors:

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Office hours (tentative): Tue 3 – 4 PM
Thu 10 – 11 AM

Lijuan Xia
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Teaching Assistants (TA):

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Undergraduate Instructional Assistants (UIA):

Andrew Eshak
Cameron Weiss
Gabe Saleh
Jacob Andrade
Josh Wolfman
Logan Emerson
Ryan Lagasse
Zac Little

Credits: 4

Class Meetings: Monday and Wednesday, 2:30 – 3:45 PM, Engineering Lab II, Room 119

Laboratory Sessions: approximately three hours per week, unscheduled

Course Description: Embedded systems sense, actuate, compute, and communicate to accomplish tasks in domains such as medical, automotive, and industrial controls. In this course, students will learn the fundamentals of using microprocessor-based embedded systems to solve problems in these domains. By the end of the course, students will be able to choose appropriate hardware based on application requirements, execute and optimize programs on simple microcontrollers, and interface these controllers to other subsystems. These topics will provide a basis for upper level applied courses, including junior and senior design labs. In addition to lectures, the course will include a lab component.

Approach: This course will consist of a combination of in-class lecture/discussion and out-of-class solo and group (pairs) lab activities. The emphasis will be on the C programming language in the context of embedded microcontrollers. Particular attention will be placed on the fundamental interfaces between microcontrollers and

peripheral devices, namely General Purpose Input/Output (GPIO), asynchronous serial data communication and synchronous serial data communication. The primary microcontroller will be the ATtiny817 by Microchip.

Scheduled Activities: **Lecture/Discussion** every Monday and Wednesday, 2:30 – 3:45 PM

Homework collected every Monday at 2:30 PM, Elab II, Room 119 (top) (beginning Feb. 4)

 In-class **Quiz** every Monday (beginning Feb 4)

Lab 1 demos (week of Feb. 25)

Lab 2 demos (week of April 1)

Lab 3 demos (week of April 22)

Grading:	Lab 1:	10% (90% demo + 10% report)
	Lab 2:	15% (90% demo + 10% report)
	Lab 3:	20% (90% demo + 10% report)
	Quizzes:	15%
	Homework:	10%
	Final Exam:	30%

Accommodation Statement

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

Academic Honesty Statement

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student

who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent (http://www.umass.edu/dean_students/academic_policy).

Inclusivity Statement

We are all members of an academic community with a shared responsibility to cultivate a climate where all students/individuals are valued and where both they and their ideas are treated with respect. The diversity of the participants in this course is a valuable source of ideas, problem solving strategies, and engineering creativity. If you feel that your contribution is not being valued for any reason, please speak with me privately. You may also speak with Dr. Paula Rees, Assistant Dean for Diversity (rees@umass.edu, 413.545.6324, Marston 128), submit a comment to the box on the door of Marston 128. There are additional resources at <http://www.umass.edu/umatter/resources>.

21 Jan 2019