

[Courseware \(/courses/UTAustinX/UT.6.01x/1T2014/courseware\)](/courses/UTAustinX/UT.6.01x/1T2014/courseware)

[Course Info \(/courses/UTAustinX/UT.6.01x/1T2014/info\)](/courses/UTAustinX/UT.6.01x/1T2014/info)

[Discussion \(/courses/UTAustinX/UT.6.01x/1T2014/discussion/forum\)](/courses/UTAustinX/UT.6.01x/1T2014/discussion/forum)

[Wiki \(/courses/UTAustinX/UT.6.01x/1T2014/course_wiki\)](/courses/UTAustinX/UT.6.01x/1T2014/course_wiki)

[Progress \(/courses/UTAustinX/UT.6.01x/1T2014/progress\)](/courses/UTAustinX/UT.6.01x/1T2014/progress)

[Questions \(/courses/UTAustinX/UT.6.01x/1T2014/a3da417940af4ec49a9c02b3eae3460b/\)](/courses/UTAustinX/UT.6.01x/1T2014/a3da417940af4ec49a9c02b3eae3460b/)

[Syllabus \(/courses/UTAustinX/UT.6.01x/1T2014/a827a8b3cc204927b6efaa49580170d1/\)](/courses/UTAustinX/UT.6.01x/1T2014/a827a8b3cc204927b6efaa49580170d1/)

DESCRIPTION

An embedded system combines mechanical, electrical, and chemical components along with a computer, hidden inside, to perform a single dedicated purpose. There are more computers on this planet than there are people, and most of these computers are single-chip microcontrollers that are the brains of an embedded system. Embedded systems are a ubiquitous component of our everyday lives. We interact with hundreds of tiny computers every day that are embedded into our houses, our cars, our bridges, our toys, and our work. As our world has become more complex, so have the capabilities of the microcontrollers embedded into our devices. Therefore the world needs a trained workforce to develop and manage products based on embedded microcontrollers.

Help

The overall educational objective of this class is to allow students to discover how the computer interacts with its environment. It will provide hands-on experiences of how an embedded system could be used to solve problems. The focus of this introductory course will be understanding and analysis rather than design. It takes an effective approach to learning new techniques by doing them. We feel we have solved the dilemma in learning a laboratory-based topic like embedded systems where there is a tremendous volume of details that first must be learned before hardware and software systems can be designed.

IMPACT

The innovative aspect of this class is to effectively teach a course with a substantial lab component within the MOOC format. If MOOCs are truly going to transform education, then they must be able to deliver laboratory classes. This offering will go a long way in unraveling the perceived complexities in delivering a laboratory experience to tens of thousands of students. If successful, the techniques developed in this class will significantly transform the MOOC environment. We believe effective education requires students to learn by doing. In the traditional academic setting this active learning is delivered in a lab format. A number of important factors have combined that allow a lab class like this to be taught at this time. First, we have significant support from industrial partners ARM Inc and Texas Instruments. Second, the massive growth of embedded microcontrollers has made the availability of lost-cost development platforms feasible. Third, your instructors have the passion, patience, and experience of delivering quality lab experiences to large classes. Fourth, on-line tools now exist that allow students to interact and support each other.





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