

Pinball Machine Project Description

ECE 115: Fast Prototyping

Winter 2018, UCSD
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Course Overview/Purpose:

This course provides an introduction to system design, developing both hands-on and process skills to prepare for successful independent design projects in future courses and advanced research (in academia or in industry).

While the hands-on content of the labs focuses on mechanical and electronic prototyping skills, the disciplines of systems-level thinking and iterative design are useful in all scientific and engineering endeavors. These disciplines provide a tried-and-true methodology for designing and building projects that work and meet the desired specifications. Making something that really works is not only fun and satisfying, but the process inevitably includes lots of learning.

Over the course of four 2-week-long lab Modules, each team will design, build, characterize, and demonstrate a functioning pinball machine. We will build skills for each project Module, as needed, through lectures and lab activities. During the last two weeks of the quarter, each team will create, specify, and meet a novel requirement.

Pinball Machine Project:

The pinball machine is an arcade game in which a player manipulates steel balls to interact in an environment to score points.

Requirements:

1. Paddle should be able to propel ball through the length of playfield.
2. Multiple scoring mechanisms.
3. Display and keep score.
4. Recognize when a round is lost.
5. Start/stop button to control system.
6. Game resets itself when system turns on and when all rounds are complete.
7. Mechanism to introduce ball into play.
8. Ball naturally moves toward paddles.
9. Device must be visually appealing.

Special Requirements*:

1. Auditory feedback for score.
2. Actuator that fires when it detects ball.
3. Uses optical sensors for at least two applications.
4. Uses at least two different types of motors.

**These are requirements that need to be met specifically for this class, but are generally not a necessary requirement for a pinball machine.*