

ECE4555 Course Syllabus

ECE4555

Embedded and Hybrid Control Systems (3-0-3)

Prerequisites

ECE 3084 or ECE 3085/3550

Corequisites

None

Catalog Description

Modeling, analysis, and design of embedded and hybrid control systems.

Textbook(s)

Hristu-Varsakelis & Levine, *Handbook of Networked and Embedded Control Systems*, Birkhauser, 2005. ISBN 9780817632397 (required)

Topical Outline

Examples of embedded control systems

- * Automotive applications
- * Robotics
- * Manufacturing systems

Modeling

- * Finite State Machines
- * Hybrid Automata
- * Analysis
- * Control design
- * Simulation issues

Design of Control Software

- * Construction of sensor, actuator, and control objects
- * Case studies

Verification

- * Software packages for verification
- * Correctness by design

Communication Issues

- * Networked control systems
- * Source coding of control signals

Real Time Considerations

- * Concurrency
- * Scheduling