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## Course Syllabus

(Tue Aug 29, 2017 04:40 PM - Thu Nov 30, 2017 05:55 PM)

# ME 555.02 / ECE 590.17

## Distributed Robotic Systems

Course Syllabus: Fall 2017

Tuesday/Thursday 4:40-5:55 pm

Hudson Hall 216

## Instructor

Jamie Snape, Ph.D.

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## Teaching Assistant

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## Description

This graduate level course will cover the artificial intelligence of distributed systems of multiple mobile robots that interact collectively, cooperate on common tasks, and coordinate their motion through the world to reach individual goals.

Course content will consist of lectures, readings, a short group paper presentation, four individual programming assignments, and a group project where students will work in teams preparing for an in-class robot soccer competition to be held at the end of the course.

Topics covered will include:

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Cooperation, path planning, communication and sensor networks, exploration, robot soccer.

- Collectivity: flocking, foraging, formation, herding, swarming.
- Coordination: collision avoidance, path planning, self-driving cars, traffic management.
- Task allocation: biological-inspired, market-based, role-based.
- Heterogeneous robots: aerial-ground robot, human-robot.

## Prerequisites

Basic knowledge of linear algebra and probability and statistics, programming experience. Some knowledge of kinematics and dynamics is helpful, but not required. No previous knowledge of artificial intelligence is assumed.

## Grading

- Paper Presentation – 10%
- Programming Assignments (3) – 20% each – see the assignments page on [Sakai](#)
- Project – 30%

## Late Submission Policy

Deadlines for each assignment are posted on the course calendar. Assignments must be submitted to [Sakai](#) before class (4:40 pm) on the posted due date. Late submissions will be deducted 1 point (out of the possible 20 for each assignment) for each day past the due date, however an automatic 7-day extension will be granted for up to one assignment. No extensions will be granted for the project.

## Honor Code

Students are expected to follow the [Duke Honor Code/Community Standard](#). Any form of cheating will not be tolerated and will be reported.

## Texts

There is no required course text. Links to the readings are provided in the course schedule.

## Course Schedule

See the calendar page on [Sakai](#).

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