

EE 5/7394 (June 2019)

Introduction to Drone Communications (5394)/Advanced Drone Communications (7394)

Webpage: http://lyle.smu.edu/~camp/courses/ee7394_taos/index.html

Instructor: [Professor Joseph Camp](#)

Email: "camp" AT "smu.edu"

Office hours: Immediately following lecture or by appointment.

Time/Place:

The course will meet each weekday for 2.25 hours. The exact time and location is yet to be determined.

Course Description: In this course, students will learn the fundamentals of experimentation research for the purposes of designing novel measurement studies for drone communications. Students will also learn about the unique problems that are facing wireless communications when designed for unmanned aerial vehicles (UAVs), which has the challenges of Doppler effects induced by high levels of mobility, limited power consumption, and highly-restrictive load capabilities. In the advanced version of the course (7394), students take on leadership roles with the labs and the projects and are expected to lead efforts to publications in top-tier conferences with measurement results.

Background: Students must be proficient in computer programming and have taken a course in differential equations.

Grading:

50% Labs (4)

50% Project (Proposal, Final Presentation, and Data)

[Schedule](#)

You may discuss **lab** assignments with classmates but all solutions must be original and individually prepared. Late lab work will be penalized at 15% of its full credit per day up to a maximum of 4 days, after which no late work will be accepted.

The [SMU Honor Code](#) will be strictly enforced.

Embrey Fellowship Research Overview Video Final



JOE CAMP SMU ELECTRICAL ENGINEERING VIDEO



Required Textbooks: None.

Other Resources:

Topics:

- At-Scale Experimentation/Crowdsourcing
- Problem Formulation and Experimental Design
- Statistical Analysis of Experimental Data
- Planning and Documenting Experiments
- Wireless Communications and Networking

Disability Accommodations:

Students needing academic accommodations for a disability must first be registered with Disability Accommodations & Success Strategies (DASS) to verify the disability and to establish eligibility for accommodations. Students may call 214-768-1470 or visit <http://www.smu.edu/ALEC/DASS> to begin the process. Once registered, students should then schedule an appointment with the professor to make appropriate arrangements.

Religious Observance:

Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities:

Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalog)

Student Learning Outcomes (ABET/SACS):

- (A/I): Ability to apply knowledge of mathematics, science, and engineering
- (E/II): Ability to identify, formulate, and solve engineering problems
- (G/III): Ability to communicate effectively
- (K/IV): An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

EE 5/7394 (June 2019) Schedule

Day #	Date	Topic
1	6/5	Introduction to Course/Drone Communications
2	6/6	Flight Tools and APIs
3	6/7	In-Field Lab 1: First Flights
4	6/10	Wireless Primer/Software Defined Radio (SDR)
5	6/11	Software Defined Radio (SDR) Pre-Lab
6	6/12	In-Field Lab 2: SISO Ground RX, Drone TX
7	6/13	Automated Flight Control Lecture and Pre-Lab
8	6/14	Williams Lake Trip (Multiple Classes)
9	6/17	In-Field Lab 3: Automated Wireless/Flight Control
10	6/18	MIMO/Beamforming
11	6/19	In-Field Lab 4: MIMO Ground RX, Drone TX
12	6/20	Project-Driven Literature Review
13	6/21	Project Proposals
14	6/24	In-Field Project Experimentation
15	6/25	In-Field Project Experimentation
16	6/26	In-Field Project Experimentation
17	6/27	In-Field Project Experimentation
18	6/28	In-Field Project Experimentation
19	7/1	Final In-Field Experimentation
20	7/2	Final Project Presentations

*This schedule is best-effort as of the beginning of the semester and subject to change according to the time available in the semester.