United States Naval Academy
Department of Weapons, Robotics, and Control Engineering

Course: EW281C / EW282C Introduction to Drone Technology

Credits: 1 credit – 0 recitation hours – 2 laboratory hours

Course Description: EW281C Introduction to Drone Technology (i.e. "School of Drones") is the introductory course in the USNA Unmanned Aerial System (UAS) program. The Fall semester (EW281C) focuses on multi-rotor drone technology, whereas the Spring semester (EW282C) highlights fixed-wing UAS technology. The objectives of this course are to introduce UAS technology and develop underclass midshipmen as remote pilots and UAS designers/builders. The course also introduces students to safety concerns of UAS flight, licensing, and regulation of UAS.

Pre-requisites: None

Course Coordinator: Prof. DeVries and Prof. Evangelista

Textbook: None

Course Objectives:
- Learn all necessary skills to construct, test, and maiden a quadrotor built from provided components
- Understand the mechanical, electronic, control theoretic and wireless communication components necessary to remotely pilot a small drone.
- Be able to explain at a general level all major subsystems on your quadrotor
- Understand basic lithium battery characteristics and follow safe lithium battery use, storage, charging, and maintenance procedures
- Understand the regulatory procedures of drone pilot certification and licensing and basic safety measures required of UAS flight
- Complete a qualification process / demonstrate piloting skills as necessary to fly on and off the yard in support of projects and research

Desirable, but not mandatory outcomes include:
- Pass the FAA Part 107 remote pilot licensing exam
- Compete in a public drone race event showcasing your skills and building interest in technology
- (Time permitting) Learn about laser cutting and 3D printing with regard to making new or replacement parts for a quadrotor

Topics:
Unmanned aerial systems (UAS)
Closed loop control systems
Autonomous Control
Sensors
Small electronics
Wireless data and video transmission
Lithium batteries

Last Updated: 16-December-2020