GENERAL:
Course Id: UAS110
Course Name: Intro to Unmanned Aerial Vehicles
Credits: 3
Prerequisites: none
Revision Date: August, 2016

COURSE DESCRIPTION:
A first course in unmanned aerial vehicles (UAVs), aka “drones”, and the technologies involved in their operation. Coverage includes UAV components, command and control (C2) communication systems, basics of flight, regulatory and regulations, safety and societal considerations. Laboratory activities provide opportunity for students to gain hands-on experience in working with UAVs. Five hours combined lecture and laboratory per week.

COURSE OBJECTIVES:
Upon successful completion of the course, the student should be able to:
1. recognize and describe the role of unmanned aerial vehicles (UAVs) in past, present, and future society
2. comprehend and explain various components of UAVs
3. comprehend and explain basics of flight and flight control systems
4. understand and describe basic regulations applicable to UAV flight

COURSE OUTLINE:
1. Overview and background
   a. definitions
   b. history of UAVs
   c. classifications of UAVs
      i. scale
      ii. lift generation method
   d. contemporary applications
      i. military
      ii. government
      iii. civil
   e. societal impact and future outlook
   f. operational considerations
      i. liability / legal issues
      ii. insurance
      iii. ethical implications
      iv. human factors
      v. LOS / BLOS
2. Unmanned Aerial System (UAS) components
   a. platforms
      i. configurations
      ii. characteristics
      iii. applications
   b. propulsion
      i. internal combustion engines
      ii. turbine engines
      iii. electric systems
   c. on-board flight control
   d. payloads
      i. sensing / surveillance
      ii. weaponized
iii. delivery

e. communications
   i. command/control
   ii. telemetry

d. launch / recovery systems

g. ground control stations

3. Concepts of flight
a. aerodynamics
   i. lift
   ii. weight
   iii. thrust
   iv. drag
b. flight performance
   i. climbing vs. gliding flight
   ii. range / endurance
c. stability and control
   i. flight axes
   ii. flight controls
   iii. autopilots

4. Regulatories and regulations
a. homeland regulatories
   i. FCC
   iii. FAA
b. foreign regulatories
c. regulations
   i. FCC compliance
   ii. sUAS registration
   ii. Federal Aircraft Regulations (FARs)
d. licensure
e. safety considerations

SUPPORTIVE MATERIALS:

Online Resources:
- http://www.faa.gov/
- http://www.faa.gov/regulations_policies/handbooks_manuals/aviation/phak/
- http://www.uavchecklist.com/
- http://dronetraininghq.com/
- http://www.precisionhawk.com/lancaster
- https://3dr.com/
- http://www.dji.com/
- https://www.youtube.com/user/pilottrainingsystem/playlists
- www.m-w.com, Merriam-Webster’s OnLine Collegiate Dictionary & Thesaurus.

Reference Books:


Baichtal, Building Your Own Drones: A Beginners’ Guide to Drones, UAVs, and ROVs. Que Publishing, 2016. 978-0789755988


Glover, *Drone University*. DroneUniversity, 2014. 978-092316030


STUDENTS WITH DISABILITIES

Students reserve the right to decide when to self-identify and when to request accommodations. Students requesting approval for reasonable accommodations should contact the Office for Students with Disabilities (OSD). Students are expected to adhere to OSD procedures for self-identifying, providing documentation and requesting accommodations in a timely manner. Students will present the OSD Accommodation Approval Notice to faculty when requesting accommodations that involve the faculty.

Contact Information:
- Location: Carter Hall - G-35
- Phone: (724) 938-5781
- Fax: (724) 938-4599
- Email: osdmail@calu.edu
- Web Site: www.calu.edu/osd

Syllabus Addendum

California University of Pennsylvania
Reporting Obligations of Faculty Members under Title IX

California University of Pennsylvania and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with the Title IX of the Education Amendments of 1972 and guidance from the Office of Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator, Dr. John A. Burnett, Special Assistant to the President for EEO, Office of Social Equity, South Hall 112, Burnett@calu.edu, 724-938-4014. The only exceptions to the faculty member’s reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy.

The University’s information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at:
- Office of Social Equity, South Hall 112, 724-938-4014
  - Social Equity Home Page www.calu.edu/SocialEquity
  - Social Equity Policies www.calu.edu/SEpolicies
  - Social Equity Compliant Form www.calu.edu/SEcomplaint
- Counseling Center, Carter Hall G53, 724-938-4056
- End Violence Center, Carter Hall G94, 724-938-5707
- Student Affairs, Natali Student Center 311, 724-938-4439
- Wellness Center, Carter Hall G53, 724-938-4232
- Women’s Center, Natali Student Center 117, 724-938-5857
- Threat Response Assessment and Intervention Team (T.R.A.I.T.) & Dept. of Public Safety & University Police, Pollock Maintenance Building, 724-938-4299
  - EMERGENCY: From any on-campus phone & Dial H-E-L-P or go to any public pay phone & Dial *1. (*Identify the situation as an emergency and an officer will be dispatched immediately.)