

Course Outline of Record

Los Medanos College

2700 East Leland Road

Pittsburg CA 94565

Course Title: Basic Drone Piloting

Subject Area/Course Number: DRONE-012N

New Course OR Existing Course

Author(s): Dave Wahl

Subject Area/Course No.: DRONE-012N

Units: NC

Course Title: Basic Drone Piloting

Discipline(s): Aeronautics, Electronic Technology

Pre-Requisite(s): none

Co-Requisite(s): none

Advisories: At least 16 years old, able to read, write, speak, and understand English, be in a physical and mental condition to safely fly a UAS

Catalog Description: Students will learn the principles, guidelines and regulations regarding effective piloting of unmanned aerial vehicles. Safety and ethics associated with drone flight as well as the law will also be stressed.

Schedule Description: In this course you will learn the principles, guidelines and regulations regarding effective piloting of unmanned aerial vehicles. Safety and ethics associated with drone flight as well as the law will also be discussed.

Hrs/Mode of Instruction: Lecture: _18_ Scheduled Lab: 54___ HBA Lab: __ Composition: ____ Activity: ____ Total Hours _72_

Credit Credit Degree Applicable (DA) Credit Non-Degree (NDA) Noncredit (NC) Grading Pass/No Pass/Satisfactory Progress (P/NP/SP) Letter (LR) Student Choice (SC) Repeatability 0 1 2 3 Unlimited

Last date of Assessment: _____

Cohort #: _4_

Please apply for:

LMC General Education Requirement(s): none

Transfer to: CSU UC IGETC Area ____ CSU GE Area ____ C-ID Number ____

Course is Baccalaureate Level: Yes No

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Signatures:

Department Chair _____ Date _____
Librarian _____ Date _____
Dean (Technical Review) _____ Date _____
Curriculum Committee Chair _____ Date _____
President/Designee _____ Date _____
CCCCD Approval Date (Board or Chancellor's Office) _____ Date _____

STAND ALONE COURSE: YES NO

Course approved by Curriculum Committee as Baccalaureate Level: YES NO

LMC GE Requirement Approved by the Curriculum Committee: _____

FOR OFFICE OF INSTRUCTION ONLY. DO NOT WRITE IN THE SECTION BELOW.

Begin in Semester _____ Catalog year 20____/20____ Class Max: _____
Dept. Code/Name: _____ T.O.P.s Code: _____ Crossover course 1/ 2: _____
ESL Class: _____ Yes / No _____ DSPS Class: _____ Yes / No _____ Coop Work Exp: _____ Yes / No _____

Class Code A Liberal Arts & Sciences SAM Code A Apprenticeship Remediation Level B Basic Skills
 B Developmental Preparatory B Advanced Occupational NBS Not Basic Skills
 C Adult/Secondary Basic Education C Clearly Occupational
 D Personal Development/Survival D Possibly Occupational
 E For Substantially Handicapped E* Non-Occupational
 F Parenting/Family Support
 G Community/Civic Development
 H General and Cultural
 I Career/Technical Education
 J Workforce Preparation Enhanced
 K Other non-credit enhanced
 Not eligible for enhanced

*Additional criteria needed
 1 One level below transfer
 2 Two levels below transfer
 3 Three levels below transfer

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Institutional Student Learning Outcomes:

General Education SLOs:

At the completion of the LMC general education program, a student will:

1. read critically and communicate effectively as a writer and speaker.
2. understand connections among disciplines and apply interdisciplinary approaches to problem solving.
3. think critically and creatively
4. consider the ethical implications inherent in knowledge, decision-making and action.
5. possess a worldview informed by diverse social, multicultural and global perspectives.

None

Program-Level Student Learning Outcomes (PSLOs): n/a

Course-Level Student Learning Outcomes (CSLOs):

At the end of the course the student will be able to:

1. Demonstrate comprehension of the terminology related to unmanned aircraft. (PSLO 1)
2. Identify the safety and ethical issues related to drone usage. (PSLO 3)
3. Demonstrate proper Visual Line-of-Site flight control of an unmanned aircraft system while executing various operations. (PLSO 3, 4)

Assessment Instruments:

| | Homework Assignments | Lab Projects | Midterms and Final |
|--------|----------------------|--------------|--------------------|
| CSLO 1 | X | | X |
| CSLO 2 | X | | X |
| CSLO 3 | | X | |

CSLO 1:

Homework Assignments: Reading assignments will be assessed through quizzes and class projects demonstrating ability to plan and execute basic drone missions utilizing terminology related to equipment, cameras, flight rules and regulations, weather, safety and ethics.

Mid-Term and Final Exam: Will be assessed through exams demonstrating ability to utilize terminology related to all aspects of sUAV drone equipment, cameras, flight rules and regulations, weather, safety and ethics.

CSLO 2:

Homework Assignments: Students to perform online research on the subject of sUAV safety and ethics related to basic drone missions including risk assessment and liability. Students to verbally report results of research in peer-led small groups.

Mid-Term and Final Exam: **written** exams to measure student mastery of operating guidelines related to safety, crew resource management, risk assessment, liability coverage, the law and ethics.

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CSLO 3:

Lab Projects: Will be assessed through quizzes and by demonstrating ability to plan and execute basic drone missions while utilizing applicable regulations and best practices relating to small unmanned aircraft aerial hardware, flight patterns, drone handling skills, waypoint navigation, and observer role

Method of Evaluation/Grading:

A (Passing) level student work: Tests and exams show a coherent and consistent understanding of all systems. The student is able to name the components and the purpose of the common systems. Through both practical hands-on and by exam the student is able to explain and operate major systems. The student is able to clearly communicate verbally and in written form the system design, operation and limitations.

C (Satisfactory Progress) level student work: The student demonstrates through exams and practical hands on projects an understanding of most but not all systems. The student can name most of the major systems but cannot name or explain many of the components that make up the different systems. The student can name and adjust the major but does not recognize some of these components and how they work with each other. When writing mission orders, the needed precautions are clear but lacks the details to properly explain why.

Student progress in this course will be evaluated through written examinations covering required text materials, and lab projects required for all students. The evaluation will consist as follows:

2 unit exams @ 100 points = 200 points
1 final exam @ 100 points = 100 points
10 Quiz's @ 10 points = 100 points
Total 400 points

Course Content:

1. Introduction to UAV/drones
2. Equipment
 - a. UAVS
 - i. Choosing proper equipment
 1. Multi Rotor
 2. Fixed wing
 - ii. Top manufacturers
 - iii. Do's and don'ts of equipment purchases
 - iv. Maintenance
 - v. Trouble Shooting
 - vi. Choosing the right battery power
 - b. Cameras
 - i. Still Capture
 1. Lens choices
 2. Camera choices
 3. Filters

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- ii. Video Capture
 - 1. Camera angles
 - 2. Capturing motion
- c. Proper Equipment Packing procedures
- 3. Flying
 - a. Certification to Fly Rules
 - b. FAA regulations
 - c. National Airspace
 - i. FAA Waivers
 - ii. Airport information
 - d. Flight Simulation
 - e. Flight Planning
 - f. Gimbal Skills
 - i. Hovering and Tilting
 - g. Aerial Hardware
 - h. Flight Patterns
 - i. Drone Handling Skills
 - j. Waypoint Navigation
 - k. Observer role
- 4. Safety
 - a. Operating guidelines
 - b. Crew resource management
 - c. Risk Assessment
 - d. Liability coverage
- 5. The Law
- 6. Ethics

Lab By Arrangement Activities (If Applicable): none

Instructional Methods:

- Lecture
- Lab
- Activity
- Problem-based Learning/Case Studies
- Collaborative Learning/Peer Review
- Demonstration/Modeling
- Role-Playing
- Discussion
- Computer Assisted Instruction
- Other (explain) _____

Textbooks:

1. Federal Aviation Administration. Pilot's Handbook of Aeronautical Knowledge, 1st ed. Washington DC: Federal Aviation Administration, 2008 Recommended
2. Rupprecht, Jonathan. Drones: Their Many Civilian Uses and the U.S. Laws Surrounding Them, 2nd ed. CreateSpace Independent Publishing Platform, 2015 Recommended