



## COURSE OUTLINE FOR CREDIT COURSE

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### Basic Course Information

Courses numbered 1 - 49 are remedial or college preparatory courses which do not apply toward an A. A. Degree and are not intended for transfer. Courses numbered 50-99 apply toward an AA Degree, but are not intended for transfer. Courses numbered 100 and higher apply toward an AA Degree and/or are intended for transfer to a four-year college or university.

**Discipline:** GCIP

**Course Number:** 168

**Title:** Digital Imaging with Drones

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### Units/Hours/Grading

**Unit Value:** 3.000

**Lecture Hours Per Week:** 1.500

**Lab Hours Per Week:** 4.500

**Outside of Class Hours**

**Per Week:**

**Total Lecture Hours:** 24.000

**Total Lab Hours:** 72.000

**Total Outside of Class**

**Hours:**

**Grading Basis:** Grade/Pass/No Pass

**Basic Skills Requirements:** Appropriate Language and/or Computational Skills.

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### Requisites

To satisfy a prerequisite, the student must have earned a letter grade of A, B, C or P(Pass) in the prerequisite course, unless otherwise stated.

<b>Prerequisite:</b> None
<b>Corequisite (Course required to be taken concurrently):</b> None
<b>Prerequisite: (Completion of, or concurrent enrollment in):</b> None
<b>Recommended Preparation:</b> None
<b>Limitation on Enrollment (e.g. Performance tryout or audition):</b> None

### Catalog Description

An introduction to using drones or unmanned vehicles for digital imaging. This hands-on course covers building, operating, and outfitting for still and video imaging and image capture.

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### Student Learning Outcomes

Upon successful completion of the course, the student will be able to:

1. Demonstrate successful drone operation and image capture.
  2. Demonstrate successful mission planning, drone operation and image capture of mapping project within two hours of solar noon, and use photogrammetry software to post-process.
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## **Specific Course Objectives**

Upon successful completion of the course, the student will be able to:

1. Learn to properly operate a basic drone;
  2. Understand the components, equipment, and technology to set-up a working drone;
  3. Capture still or video image while operating a drone;
  4. Work as a team of four individuals with each, in turn, learning the different operator rolls: camera operator, person operating the controls of the drone, visual observer, and remote pilot in command;
  5. Operate and program a drone equipped with a variety of sensors including GPS, video and/or still photography;
  6. Understand post-processing techniques to obtain the desired outcome.
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## **Methods of Instruction**

Methods of Instruction may include, but are not limited to, the following

1. Demonstration
  2. Discussion
  3. Group Projects/Activities
  4. Guest Speakers
  5. Lab
  6. Lecture
  7. Observation
  8. Videos/Film
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## **Content in Terms of Specific Body of Knowledge**

1. Introduction
  - a. Types of drones
  - b. Ready to fly RTF vs Do it yourself DIY
  - c. Multi-rotor, hexicopter, fixed-wing, hybrids, octocopter, heavy-lifters
2. Equipment Setup
  - a. Safety
  - b. Motors
  - c. Propellers
  - d. Electronic speed controls
  - e. Batteries
  - f. Remote controls
  - g. Assembly
  - h. Repairing, replacing, service and maintenance
  - i. Normal procedures
  - j. Emergency Procedures
  - k. Regulations
3. Digital Imaging
  - a. Survey potential capture devices
  - b. Checklist
  - c. Flight operation and camera operation
  - d. First Person View systems
  - e. Flight Parameters
  - f. Flight times & wireless transmission
  - g. Limitations
  - h. Way finding

4. Post Processing and Delivery
    - a. Stabilize video
    - b. Panoramic photos
    - c. Remove lens distortion
    - d. Sharing images
    - e. Photogrammetry
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## Textbooks/Resources

### Textbooks

1. **Primary Source**  
Smith, Colin. *The Photographer's Guide to Drones*. 1st Rocky Nook, 2016.
2. McGriffy, David. *Make: Drones*. 1st Maker Media, Inc, 2016.

### Other

1. Access to internet to view on-line instructional videos.
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## Assignments

### Required Reading:

The Beginner's Guide to FPV (B&W) Alex Protogerellis (Author) ISBN-13: 978-1300820000  
<http://www.popularmechanics.com/technology/aviation/diy-flying/the-art-of-flying-your-very-own-drone-16068825>  
<http://www.Travelbydrone.com> <http://www.dronestagr.am>

### Required Writing:

Digital imaging drone project proposal: contains rough ideas, sketches, shots that team members will create, required equipment, along with a description of the message to convey to target audience.

### Critical Thinking:

Analyze the capabilities, limitations, and features of technology and equipment to capture the desired images based on client needs.

### Outside Assignments:

Reading articles and journals to maintain currency in new and emerging technology. Sketching and designing shots to capture intended views.

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## Methods of Assessment

Methods of Assessment may include, but are not limited to, the following:

1. Class Work
  2. Demonstration
  3. Group Projects
  4. Lab Activities
  5. Class Participation
  6. Projects
  7. Simulation
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## Open Entry/Open Exit

No course is not offered as open entry/open exit

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## **Repeatability**

**Course is Repeatable for Reasons other than a Deficient Grade?** No

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## **Contact Person**

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