

## GENERAL STUDIES COURSE PROPOSAL COVER FORM

**Course information:**

Copy and paste **current** course information from [Class Search/Course Catalog](#).

College/School	The College of Liberal Arts and Sciences	Department/School	Geographical Sci & Urban Plng
Prefix:	<b>GIS</b>	Number:	<b>202</b>
Title:	Drones to Satellites: Observing Earth from Above		Units:
			3

**Course description:**

Seeing the Earth from above has a profound effect on how we view our planet and the people and cultures that call this place home. Throughout history, humans has modified the planet to provide natural, social, and cultural resources. With modern technologies, we have the means to view Earth from above and gain a more holistic perspective of our treasured planet alongside an awareness of how globalization is altering ecosystem services. This course is an introduction to Earth Observation using geospatial platforms like drones, airplanes, and satellites. You will learn how images and data of our Earth are acquired from above and how they can be processed and interpreted using various computer software and hardware to understand our world. You will gain practical skills for generating information from images to better understand how human beings use and alter Earth’s surface.

Is this a cross-listed course? No If yes, please identify course(s):

Is this a shared course? No If so, list all academic units offering this course:

*Note- For courses that are crosslisted and/or shared, a letter of support from the chair/director of **each** department that offers the course is required for **each** designation requested. By submitting this letter of support, the chair/director agrees to ensure that all faculty teaching the course are aware of the General Studies designation(s) and will teach the course in a manner that meets the criteria for each approved designation.*

Is this a **permanent-numbered** course with topics? No

If **yes**, each topic requires **an individual submission**, separate from other topics.

**Requested designation:** CS

**Mandatory Review:** Yes

*Note- a **separate** proposal is required for each designation.*

**Eligibility:** Permanent numbered courses **must** have completed the university’s review and approval process. For the rules governing approval of omnibus courses, contact [Phyllis.Lucie@asu.edu](mailto:Phyllis.Lucie@asu.edu).

**Submission deadlines dates are as follow:**

For Fall 2021 Effective Date: October 2, 2020

For Spring 2022 Effective Date: March 5, 2021

**Area proposed course will serve:**

A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. It is the responsibility of the chair/director to ensure that all faculty teaching the course are aware of the General Studies designation(s) and adhere to the above guidelines.

**Checklists for general studies designations:**

- Complete and attach the appropriate checklist
- [Literacy and Critical Inquiry core courses \(L\)](#)
- [Mathematics core courses \(MA\)](#)
- [Computer/statistics/quantitative applications core courses \(CS\)](#)
- [Humanities, Arts and Design core courses \(HU\)](#)
- [Social-Behavioral Sciences core courses \(SB\)](#)
- [Natural Sciences core courses \(SQ/SG\)](#)
- [Cultural Diversity in the United States courses \(C\)](#)
- [Global Awareness courses \(G\)](#)
- [Historical Awareness courses \(H\)](#)

**A complete proposal should include:**

- Signed course proposal cover form
- [Criteria checklist](#) for General Studies designation being requested
- Course catalog description
- Sample syllabus for the course
- Copy of table of contents from the textbook and list of required readings/books

**Proposals must be submitted electronically with all files compiled into one PDF.**

**Contact information:**

Name	Amy Frazier	E-mail	<a href="mailto:Amy.Frazier@asu.edu">Amy.Frazier@asu.edu</a>	Phone	480-727-7414
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**Department Chair/Director approval: *(Required)***

Chair/Director name (Typed): Dr. Elizabeth Wentz Date: 06/01/2021

Chair/Director (Signature): 

## Arizona State University Criteria Checklist for

### **MATHEMATICAL STUDIES [CS]**

#### **Rationale and Objectives**

The **Mathematical Studies** requirement is intended to ensure that students have skill in basic mathematics, can use mathematical analysis in their chosen fields, and can understand how computers can make mathematical analysis more powerful and efficient. The **Mathematical Studies** requirement is completed by satisfying both the **Mathematics [MA]** requirement and the **Computer/Statistics/Quantitative Applications [CS]** requirement explained below.

The **Mathematics [MA]** requirement, which ensures the acquisition of essential skill in basic mathematics, requires the student to complete a course in College Mathematics, College Algebra, or Pre-calculus; or demonstrate a higher level of skill by completing a mathematics course for which a course in the above three categories is a prerequisite.

The **Computer/Statistics/Quantitative Applications [CS]** requirement, which ensures skill in real world problem solving and analysis, requires the student to complete a course that uses some combination of computers, statistics, and/or mathematics.\* Computer usage is encouraged but not required in statistics and quantitative applications courses. At a minimum, such courses should include multiple demonstrations of how computers can be used to perform the analyses more efficiently.

\*CS does *not* stand for computer science in this context; the “S” stands for statistics. Courses in computer science must meet the criteria stated for CS courses.

Revised April 2014

Proposer: Please complete the following section and attach appropriate documentation.

<b>ASU--[CS] CRITERIA</b>			
<b>A COMPUTER/STATISTICS/QUANTITATIVE APPLICATIONS [CS] COURSE MUST SATISFY ONE OF THE FOLLOWING CRITERIA: 1, 2, OR 3</b>			
YES	NO		Identify Documentation Submitted
		<b>1. Computer applications*:</b> courses must satisfy both <b>a</b> and <b>b</b> :	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<b>a.</b> Course involves the use of computer programming languages or software programs for quantitative analysis, algorithmic design, modeling, simulation, animation, or statistics.	
		<b>b.</b> Course requires students to analyze and implement procedures that are applicable to at least one of the following problem domains ( <b>check those applicable</b> ):	
<input type="checkbox"/>	<input type="checkbox"/>	i. Spreadsheet analysis, systems analysis and design, and decision support systems.	
<input type="checkbox"/>	<input type="checkbox"/>	ii. Graphic/artistic design using computers.	
<input type="checkbox"/>	<input type="checkbox"/>	iii. Music design using computer software.	
<input type="checkbox"/>	<input type="checkbox"/>	iv. Modeling, making extensive use of computer simulation.	
<input type="checkbox"/>	<input type="checkbox"/>	v. Statistics studies stressing the use of computer software.	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	vi. Algorithmic design and computational thinking.	
<p>*The <b>computer applications</b> requirement <b>cannot</b> be satisfied by a course, the content of which is restricted primarily to word processing or report preparation skills, the study of the social impact of computers, or methodologies to select software packages for specific applications. Courses that emphasize the use of a computer software package are acceptable only if students are required to understand, at an appropriate level, the theoretical principles embodied in the operation of the software and are required to construct, test, and implement procedures that use the software to accomplish tasks in the applicable problem domains. Courses that involve the learning of a computer programming language are acceptable only if they also include a substantial introduction to applications to one of the listed problem domains.</p>			

YES	NO		Identify Documentation Submitted
		<b>2. Statistical applications:</b> courses must satisfy <b>a, b,</b> and <b>c.</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<b>a.</b> Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Pre-calculus, or a course already approved as satisfying the MA requirement.	
		<b>b.</b> The course must be focused principally on developing knowledge in statistical inference and include coverage of all of the following:	
<input type="checkbox"/>	<input type="checkbox"/>	i. Design of a statistical study.	
<input type="checkbox"/>	<input type="checkbox"/>	ii. Summarization and interpretation of data.	
<input type="checkbox"/>	<input type="checkbox"/>	iii. Methods of sampling.	
<input type="checkbox"/>	<input type="checkbox"/>	iv. Standard probability models.	
<input type="checkbox"/>	<input type="checkbox"/>	v. Statistical estimation	
<input type="checkbox"/>	<input type="checkbox"/>	vi. Hypothesis testing.	
<input type="checkbox"/>	<input type="checkbox"/>	vii. Regression or correlation analysis.	
<input type="checkbox"/>	<input type="checkbox"/>	<b>c.</b> The course must include multiple demonstrations of how computers can be used to perform statistical analysis more efficiently, if use of computers to carry out the analysis is not required.	

YES	NO		Identify Documentation Submitted
		<b>3. Quantitative applications:</b> courses must satisfy <b>a, b, and c:</b>	
<input type="checkbox"/>	<input type="checkbox"/>	<b>a.</b> Course has a minimum mathematical prerequisite of College Mathematics, College Algebra, or Pre-calculus, or a course already approved as satisfying the MA requirement.	
		<b>b.</b> The course must be focused principally on the use of mathematical models in quantitative analysis and decision making. Examples of such models are:	
<input type="checkbox"/>	<input type="checkbox"/>	i. Linear programming.	
<input type="checkbox"/>	<input type="checkbox"/>	ii. Goal programming.	
<input type="checkbox"/>	<input type="checkbox"/>	iii. Integer programming.	
<input type="checkbox"/>	<input type="checkbox"/>	iv. Inventory models.	
<input type="checkbox"/>	<input type="checkbox"/>	v. Decision theory.	
<input type="checkbox"/>	<input type="checkbox"/>	vi. Simulation and Monte Carlo methods.	
<input type="checkbox"/>	<input type="checkbox"/>	vii. Other (explanation must be attached).	
<input type="checkbox"/>	<input type="checkbox"/>	<b>c.</b> The course must include multiple demonstrations of how computers can be used to perform the above applications more efficiently, if use of computers is not required by students.	

Course Prefix	Number	Title	General Studies Designation
GIS	202	Drones to Satellites: Observing Earth from Above	CS

Explain in detail which student activities correspond to the **specific** designation criteria.

Please use the following organizer to explain how the criteria are being met.

Criteria (from checklist)	How course meets spirit (contextualize specific examples in next column)	Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
1a: Course involves software programs for quantitative analysis	The course makes use of a plethora of software programs for processing and quantitatively analyzing drone imagery and data including MissionPlanner, ArcGIS, QGIS, Pix4dMapper, Agisoft Metashape, Spark AR (augmented reality), Excel.	<p>Module 1 (Assignment 1): students develop a drone flight missing using MissionPlanner (open source) software.</p> <p>Module 2 (Assignment 2): Students create a mosaic of drone images using Agisoft Photoscan and ArcGIS software packages</p> <p>Module 3 (Assignment 3): Students utilize semi-automated machine learning techniques in ArcGIS to perform counts of wildlife</p> <p>Module 4 (Assignment 4): Students utilize Agisoft Metashape (computer vision) software to construct three dimensional models from overlapping drone images</p> <p>Module 5 (Assignment 5): Students utilize Agisoft Photoscan, ArcGIS/QGIS, and Spark AR (augmented reality) software to reconstruct artifacts in a historical cemetery.</p> <p>Module 6 (Assignment 6): Students utilize Microsoft Excel software and VBA Macros along with drone measurements of carbon dioxide to understand how greenhouse gasses change with altitude.</p>
1biv: algorithmic design and computational thinking	Each of the six assignments require students to design and implement sets of instructions to perform various tasks related to image and data processing.	<p>Module 1 (Assignment 1): Students design a computational workflow for planning a drone mission in both familiar (data available) and unfamiliar (data unavailable) landscapes.</p> <p>Module 2 (Assignment 2): Students implement a set of algorithms to mosaic a set of imagery using computational data processing.</p> <p>Module 3 (Assignment 3): Students implement both a manual-based method and machine learning method for counting wildlife (terns) in drone imagery and then compare the advantages and disadvantages of the two computational approaches.</p> <p>Module 4 (Assignment 4): Students implement a structure-from-motion, computer vision-based algorithmic workflow for estimating tree heights across a protected reserve.</p> <p>Module 5 (Assignment 5): Students integrate drone-based and ground-based imagery to create 3D digital representations of historical artifacts for preservation.</p>

		Module 6 (Assignment 6): Students impement spreadsheet analyses in Excel with VBA Macros algorithms to create visualizations of carbon dioxide measurements and analyze how they change with altitude.



## Course Catalog Description

### GIS 202: Drones to Satellites: Observing Earth from Above

Seeing the Earth from above has a profound effect on how we view our planet. Introduces Earth observation using platforms like drones, airplanes and satellites. Covers how images and data of our Earth are acquired from above and how they can be processed and interpreted to understand our world. Students gain practical skills for generating information from images to better understand how human beings use and alter Earth's surface.

*Course Information and Syllabus***Instructor:** Dr. Amy Frazier**Instructor Email:** [Amy.Frazier@asu.edu](mailto:Amy.Frazier@asu.edu)

**Virtual Office Hours:** If you would like to receive feedback or have a question to discuss 'in person', I am happy to schedule virtual office hours where we can chat through an online audio or video conferencing platform. To request a virtual appointment, please send me a message through the Inbox feature in Canvas or email directly at the address above and we can set up a time to chat!

**I. Course Description**

Seeing the Earth from above has a profound effect on how we view our planet and the people and cultures that call this place home. Throughout history, humans have modified the planet to provide natural, social, and cultural resources. With modern technologies, we have the means to view Earth from above and gain a more holistic perspective of our treasured planet alongside an awareness of how globalization is altering ecosystem services. **This course is an introduction to Earth Observation using geospatial platforms like drones, airplanes, and satellites.** You will learn how images and data of our Earth are acquired from above and how they can be processed and interpreted to understand our world. You will gain practical skills for generating information from images to better understand how human beings use and alter Earth's surface.

**II. Textbook**

There is one **required textbook** for this course:

*Fundamentals of Capturing and Processing Drone Imagery and Data.* Edited by Amy E. Frazier and Kunwar K. Singh. Taylor and Francis. First Edition. 2021.

*\*If you are unable to purchase the textbook for any reason (including cost), please let me know as soon as possible and we can find alternative solutions.*

Additional readings are integrated as content into the pages in the Canvas LMS. Links to external readings are provided where necessary.

**III. Student Learning Outcomes**

Upon successful completion of this course, you will be able to:

- Explain the physical principles of how light works
- Describe sources, characteristics, and common forms of remote sensing data
- Be able to locate technical information about satellites, sensors, and applications
- Be aware of latest developments in Earth observation
- Interpret information in digital imagery for a range of global awareness applications
- Explain how 3D models are built from remote sensing data
- Understand the benefits and best practices of using drones for Earth observation
- Be familiar with the leading software programs for processing drone imagery and data
- Perform quantitative analyses using drone imagery and data

## IV. Grading

There are 255 points available in this course, and you need to earn 250 points to receive an 'A+'. There is one extra credit activity worth 5 points right after the midterm exam. *Please note that Canvas does not have any mechanism for adding extra credit, so this quiz is treated like a normal assignment except that it increases the available points to 245 without changing the number of points you need to earn to receive each of the grades below.*

Class Grade	Points Earned	Percentage
A+	250 or more	>98%
A	236-249	92 to 98%
A-	230-235	90 to 92%
B+	223-229	87.1 to 89.9%
B	210-222	82.1 to 87%
B-	202-209	80 to 82 %
C+	191-201	75 to 79%
C	165-190	65 to 74.4 %
D	127-164	50 to 64.4 %
E	Less than 120	Less than 50%

## IV. Course Organization and Content

All course modules, assignments, and quizzes are posted and open from the day of the course starts until the course ends. However, **assignments, quizzes and exams all have due dates!** You are free to work at the pace you choose, but **you must complete the assignments, quizzes and exams before their due dates in order to receive credit.** The course is designed for you to complete one module per week.

The **mid-term and final exams will have specific open windows** when it will be possible to take the exam. The exams **MUST BE TAKEN** before the window closes. No makeup exams will be given in any circumstances.

The following describes the general organization and content of GIS 202 (Online):

### A. Modules

This course is organized into six modules (or units), plus an introductory module (Module 0). The course is designed for you to complete one module per week. The structure and organization within each module *follows a similar pattern*. In each module, there are **Pages** with the lecture material. Some pages have stars next to them. The star just means that the content has been produced in a third-party software to make it more user-friendly. You should treat these just like normal content Pages. After every few pages of material, there is a **Quiz** on that material. At the end of each module, there is an **Assignment** that sometimes has associated Assignment Questions, which are listed as Quizzes simply due to their format. Assignment Question 'Quizzes' do not require Respondus LockDown Browser. Each of these course *elements* are discussed in further detail.

#### 1. Pages

Lecture material and lessons are found on Pages in the Modules. I have constructed this class so that you never have to watch a long video lecture (hooray!). Long, video lectures can be

boring, and it is difficult to review the material if you have to sort through a 45-minute long lesson to get the good bits! Instead, I've designed GIS 202 to include lecture material, visual aids, informational videos, readings, and hands-on activities as well as critical thought questions to get you thinking outside the box. Students are responsible for ALL of the material found on each Page. I recommend reading all of the information on each page, watching all of the videos (most are under 5 minutes), and working through any of the hands-on exercises or critical thought boxes. Pages are content only and do not contain any graded assignments.

## 2. Quizzes

There are a total of 12 quizzes in this course, **each worth 5 points** for a total of 60 points. You are allowed **TWO attempts for each quiz**, and the **HIGHER** of your two quiz scores will be used in the calculation of your course grade. You will have 15 minutes to complete each quiz attempt. You must use Respondus LockDown Browser for quizzes (see below).

Each quiz consists of 5 questions taken from a pool of questions. Because quiz questions are randomly drawn from a larger pool, you are unlikely to receive the exact same set of questions on each quiz attempt. During a quiz, questions will be presented one at a time and you will not be allowed to back track to prior questions once you have submitted your answer for a question.

Quiz due dates are included with the course outline and are also listed along with each assignment on the canvas website. You can complete quizzes at any time before to their due dates. No extensions will be provided for missed quizzes.

## 2. Assignments

There are 6 Assignments, and **each assignment is worth 10 points**, for a total of 60 points. The assignments use a variety of computer software programs that are free to download. These software programs include Google Earth, Mission Planner, Image J, Agisoft Metashape, and Pix4Dmapper. The Assignments will walk you through how to download and install the software as needed. On each assignment page, there are written instructions to follow and sometimes data to download.

For some assignments, you will upload a document (such as a screen shot of your result or document with your answers) directly within the assignment. For other assignments, you will complete an **Assignment Questions Quiz** immediately following the assignment.

## 3. Assignment Question Quizzes

Assignment Question Quizzes are simply a way to complete the assignment so that it can be graded quickly. Assignment Question Quizzes consist of 5 questions, and you have 2 hours to complete your response. You do NOT need to use Respondus LockDown Browser for Assignment questions.

You may open and close the assignment response page as you wish, but doing so will not stop the 2 hour timer. When an assignment response is open, questions will appear one at a time. However, you may move backward and forwards between question pages and revise your answers as you wish.

Assignment due dates are included with the course outline and are also listed along with each assignment in Canvas.

Please read the instructions of each assignment to determine if you understand the procedures and questions. If anything is unclear, it is your responsibility to contact the instructor or TA using the Canvas inbox feature. If you are struggling with an assignment/lab, contact the Instructor or TA early. We cannot help you if we do not know there is a problem, but we also cannot guarantee help at the last minute.

## **B. Exams**

There are two exams: a midterm and the final exam. Each exam is worth 50 points for a total of 100 points. The exams will be based on the lecture pages, videos, readings, and hands-on exercises. The midterm will cover Modules 1, 2, and 3. The Final Exam is comprehensive. You must use Respondus LockDown Browser for all exams.

Exams will be given via the course website. You will have 75 minutes to complete the exam, and once you begin, you must complete the exam fully. Closing the exam does not stop the timer. I will review access logs to verify that you have only accessed the exam one time and completed it within the set time limit. You will have an approximately 3 week window in which to take each exam. When that window ends, you will no longer be able to access the exam.

If your computer crashes or something happens that requires you to access the exam a second time, you must contact me to let me know about the problem and contact Technical Support if you need immediate assistance. I cannot guarantee I will be able to respond right away or within the confines of your schedule, so please do everything possible to prevent these kinds of problems (i.e., if you're working on a laptop, make sure it's plugged in or has a full charge).

Please Note: ***No late exams will be accepted.***

**Make up exams** will be allowed only in documented cases of bereavement, hospitalization, or doctor's note specifying you were unable to complete the exam. If one of these unfortunate circumstances befalls you, **please notify me as soon as possible**. No make-up exams will be given to students who:

1. "miss" or "forget to take" an exam,
2. Have technical difficulties the night the exam is due. The exams are open for several weeks; do not wait until the last minute to take the exam!
3. encounter work conflicts,
4. were sick but did not get a doctor's note specifying that the student was unable to complete the exam during the entire exam period, or
5. who do not contact me about the reason for needing a makeup prior to the exam.

## **C. Discussion Boards**

Each week, you can earn up to 5 points per Module (35 points total) by participating in the discussion board. The discussion board is available to students to work collaboratively on assignments, help each other with any problems that arise, share cool Earth Observing tweets, tools, and tips, or discuss any parts and all parts of the course. The discussion board should be used as a place to exchange ideas and engage in general discussion. Posts that are particularly informative or helpful will earn you the most points. **In order to earn the full 5 points, you need to**

post at least one original post and respond to at least one post from another person. Points are awarded based on the quality of the posts.

The discussion board is intended to facilitate student learning through supportive engagement with peers. The discussion board is not intended as a place to ask other students to complete your work for you. Please feel free to ask for help, but do not ask others for the answers to assignments. The instructor and TA may participate in discussion treads, but discussions are not always monitored by the instructor.

I encourage everyone to:

- **Be polite:** Please respect your fellow students. Insulting, condescending or abusive words will not be tolerated and will be reported and removed.
- **Be constructive:** Be respectful of views different from your own, and be critical in a constructive way. When commenting on each other's posts or ideas, be mindful of other points of view.
- **Be specific:** Clarify the purpose of your post, especially if you need help. Write a concise, descriptive title for your post. If you are asking a question, reference the specific assignment or activity.
- **Be respectful:** The discussion boards and email class list are to be used for class purposes only. These platforms are not for posting other information. If you would like to send a non-class related email to the entire class, please contact the instructor first.

**D. Course Schedule** (all due dates are Sunday at 11:59pm Arizona time except the Final Exam)

Module	Due	What to Read	What You Need to Do
Module 0	10/17	Chapter 1	Academic Integrity Agreement
			Quiz 01: Syllabus Quiz
			Discussion 01: Icebreaker and Introductions
Module 1	10/24	Chapters 2 & 4	Quiz 02: Hiding in the Light
			Quiz 03: EMR and the Properties of Light
			Quiz 04: Light Interactions and Visual Perception
			Assignment 01: Planning a Drone Mission (Chapter 8)
			Discussion 02: Hiding in the Light
Module 2	10/31		Quiz 05: Early Platforms and the Cold War
			Quiz 06: Space Satellites
			Assignment 02: Creating a Drone Image Mosaic (Chapter 9)
			Discussion 03: Platform Pandemonium
Module 3	11/7	Chapter 3	Quiz 07: Elements of Digital Images
			Quiz 08: Turning Data into Information
			Assignment 03: Counting Wildlife in Drone Images (Chapter 10)
			Discussion 04: Resolving the Future
Midterm	11/14		Midterm Exam
Module 4	11/14	Chapter 6	Quiz 09: 3D Models and Depth Perception
			Quiz 10: Lidar
			Assignment 04: Creating 3D Models with Drone Images (Chapter 11)
			Discussion 05: 3D Data
Module 5	11/21	Chapter 5	Quiz 11: Drones: Before You Fly
			Quiz 12: Drones: Why We Fly

			Assignment 06: Historical Preservation with Drones (Chapter 16)
			Discussion 06: Privacy and Ethical Issues of Drones
Module 6	11/28	Chapter 7	Assignment 06: Tracking Greenhouse Gases with Drones (Chapter 19)
			Discussion 07: What's Next?
Final Exam	12/3		Final Exam

## **V. LockDown Browser Requirement**

This course requires the use of LockDown Browser for online quizzes and exams. Watch this video to get a basic understanding of LockDown Browser: <https://www.respondus.com/products/lockdown-browser/student-movie.shtml>

### **A. Download Instructions**

Download and install LockDown Browser from this link:

<https://download.respondus.com/lockdown/download.php?id=197112001>

### **B. Once Installed**

- Start LockDown Browser
- Log into to Canvas
- Navigate to the quiz

Note: You will not be able to access a quiz that requires LockDown Browser with a standard web browser. If you attempt to use a standard web browser, an error message will indicate that the test requires the use of LockDown Browser. Simply start LockDown Browser and navigate back to the exam to continue.

### **C. Best Practices for Taking Quizzes and Exams**

When taking an online quiz or exam, follow these guidelines:

- Select a quiet location where you won't be interrupted for the duration of the quiz/exam
- Before starting the test, know the time limit and be sure that you have allotted sufficient time in your schedule to complete the quiz/exam
- Turn off all mobile devices, phones, etc. and don't have them within reach
- Clear your area of all external materials - books, papers, other computers, or devices
- Remain at your desk or workstation for the duration of the test
- LockDown Browser will prevent you from accessing other websites or applications; you will be unable to exit the test until all questions are completed and submitted

### **D. Getting Help**

Several resources are available if you encounter problems with LockDown Browser:

- The Windows and Mac versions of LockDown Browser have a "Help Center" button located on the toolbar. Use the "System & Network Check" to troubleshoot issues. If an exam requires you to use a webcam, also run the "Webcam Check" from this area

- If you need help with visit the ASU Student Help page at <https://asu.secure.force.com/kb/articles/FAQ/How-to-Take-a-Test-Using-Respondus-LockDown-Browser-and-Webcam-Monitor>
- Respondus has a Knowledge Base available from [support.respondus.com](http://support.respondus.com). Select the "Knowledge Base" link and then select "Respondus LockDown Browser" as the product. If your problem is with a webcam, select "Respondus Monitor" as your product
- If you are still unable to resolve a technical issue with LockDown Browser, go to [support.respondus.com](http://support.respondus.com) and select "Submit a Ticket". Provide detailed information about your problem and what steps you took to resolve it

## **VI. Additional Course Details**

### **A. Computer Requirements**

This course requires a computer with Internet access and the following:

- Web browsers ([Chrome](#), [Internet Explorer](#), [Mozilla Firefox](#), or [Safari](#))
- [Adobe Acrobat Reader](#) (free)
- [Adobe Flash Player](#) (free)
- A computer speaker

### **B. Technical Support**

This course uses Canvas to deliver content. It can be accessed through **MyASU** at <http://my.asu.edu> or the Canvas home page at <https://myasucourses.asu.edu>

To monitor the status of campus networks and services, visit the System Health Portal at <http://syshealth.asu.edu/>. To contact the help desk call toll-free at 1-855-278-5080.

### **C. Online Student Success Suggestions**

Online courses operate differently than in-person course. For example, you are may work at your own pace, setting your own deadlines for assignments and quizzes within the bounds of set due dates. The following are suggestions for students to be successful when taking online courses:

- Check the course daily including the discussion boards
- Check and read all announcements
- Read and respond to course email messages as needed
- Complete assignments by the due dates specified
- Communicate regularly with your instructor and peers
- Create a study and/or assignment schedule to stay on track

## **VII. Course Policies**

### **A. Course Time Commitment**

Per ASU Online, this three-credit course requires approximately **135 hours of work**. Please expect to spend around **18 hours each week** preparing for and actively participating in this course.



## B. Late Work

The suggested course schedule assumes you will complete one module per week. However, all course materials are available from the first day of the course. As a result, you may work one modules ahead of the suggested schedule, and submit assignment and quiz responses at any time prior to their due dates.

Please note however that there are due dates for assignments and quizzes! Assignment and quiz due dates are designed to discourage students from attempting to complete all course materials during the final week of the session. It is the student's responsibility to ensure all assignments are submitted by their due date.

Notify the instructor **BEFORE** an assignment is due if an urgent situation arises and the assignment will not be submitted on time. Published assignment due dates (Arizona Mountain Standard time) are firm. Please follow the appropriate University policies to request an [accommodation for religious practices](#) or to accommodate a missed assignment [due to University-sanctioned activities](#).

## C. Submitting assignments

All assignments, unless otherwise announced, **MUST** be submitted to the designated area of Canvas. Do not submit an assignment via email.

## D. Communicating with the Instructor

Questions related to module materials, assignments, quizzes, and exams should be submitted using the interactive Inbox form included in the sidebar of the Canvas course. When submitting your question, please use the drop down options to select the relevant i) module and ii) element (e.g., assignment) that your question relates to. Tagging your question will help ensure the instructor can respond to your question in a timely manner.

Email questions of a personal nature directly to your instructor using the internal Canvas Inbox system. You can expect a response within 48 hours. I cannot guarantee responses over the weekend, although I will try my best to respond to all queries in a timely manner.

ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

***All instructor correspondence will be sent to your ASU email account. Please use your asu.edu email when sending any course-related emails.***

## E. Drop and Add Dates/Withdrawals

This course adheres to a compressed schedule and may be part of a sequenced program, therefore, there is a limited timeline to [drop or add the course](#). Consult with your advisor and notify your instructor to add or drop this course. If you are considering a withdrawal, review the following ASU policies: [Withdrawal from Classes](#), [Medical/Compassionate Withdrawal](#), and a [Grade of Incomplete](#).

## F. Grade Appeals

Grade disputes must first be addressed by discussing the situation with the instructor in person or over video chat. I will not discuss grade disputes over email. If the dispute is not resolved with the instructor, the student may appeal to the department chair per the [University Policy for Student Appeal Procedures on Grades](#).

## **G. Student Conduct and Academic Integrity**

Academic honesty is expected of all students in all examinations, assignments, laboratory work, academic transactions and records. The possible sanctions include, but are not limited to, appropriate grade penalties, course failure (indicated on the transcript as a grade of E), course failure due to academic dishonesty (indicated on the transcript as a grade of XE), loss of registration privileges, disqualification and dismissal. For more information, download the Student Academic Integrity Policy from <http://provost.asu.edu/academicintegrity>. Additionally, required behavior standards are listed in the [Student Code of Conduct and Student Disciplinary Procedures](#), [Computer, Internet, and Electronic Communications policy](#), and outlined by the [Office of Student Rights & Responsibilities](#). Anyone in violation of these policies is subject to sanctions.

[Students are entitled to receive instruction free from interference](#) by other members of the class. An instructor may withdraw a student from the course when the student's behavior disrupts the educational process per [Instructor Withdrawal of a Student for Disruptive Classroom Behavior](#).

Appropriate online behavior (also known as *netiquette*) is defined by the instructor and includes keeping course discussion posts focused on the assigned topics. Students must maintain a cordial atmosphere and use tact in expressing differences of opinion. Inappropriate discussion board posts may be deleted by the instructor.

The Office of Student Rights and Responsibilities accepts [incident reports](#) from students, faculty, staff, or other persons who believe that a student or a student organization may have violated the Student Code of Conduct.

### **Policy against threatening behavior**

All incidents and allegations of violent or threatening conduct by an ASU student (whether on-or off campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances.

### **Reporting Title IX violations**

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

### **Policy on Sexual Discrimination**

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits [discrimination](#), [harassment](#), and [retaliation](#) by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish discuss any concerns confidentially and privately.

#### **H. Prohibition of Commercial Note Taking Services**

In accordance with [ACD 304-06 Commercial Note Taking Services](#), written permission must be secured from the official instructor of the class, Dr. Amy E. Frazier, in order to sell the instructor's oral communication in the form of notes. Notes must have the notetaker's name as well as the instructor's name, the course number, and the date.

#### **I. Course Evaluation**

Students are expected to complete the course evaluation. The feedback provides valuable information to the instructor and the college and is used to improve student learning. Students are notified when the online evaluation form is available.

#### **J. Syllabus Disclaimer**

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Please remember to check your ASU email and the course site often.

You will be notified of any changes to the syllabus or course schedule via Canvas.

#### **K. Accessibility Statement**

In compliance with the Rehabilitation Act of 1973, Section 504, and the Americans with Disabilities Act as amended (ADAAA) of 2008, professional disability specialists and support staff at the Disability Resource Center (DRC) facilitate a comprehensive range of academic support services and accommodations for qualified students with disabilities.

[Qualified students with disabilities may be eligible to receive academic support services and accommodations](#). Eligibility is based on qualifying disability documentation and assessment of individual need. Students who believe they have a current and essential need for disability accommodations are [responsible for requesting accommodations and providing qualifying documentation](#) to the DRC. Every effort is made to provide reasonable accommodations for qualified students with disabilities.

Qualified students who wish to request an accommodation for a disability should contact the DRC by going to <https://eoss.asu.edu/drc>, calling (480) 965-1234 or emailing [DRC@asu.edu](mailto:DRC@asu.edu). To speak with a specific office, please use the following information:

<b>ASU Online and Downtown Phoenix Campus</b> University Center Building, Suite 160 602-496-4321 (Voice)	<b>Polytechnic Campus</b> 480-727-1165 (Voice)
<b>West Campus</b> University Center Building (UCB), Room 130 602-543-8145 (Voice)	<b>Tempe Campus</b> 480-965-1234 (Voice)

#### **L. Copyrighted materials**

Students must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

#### **M. Title IX**

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling>, is available if you wish to discuss any concerns confidentially and privately.

# Fundamentals of Capturing and Processing Drone Imagery and Data

Edited by

Amy E. Frazier  
Kunwar K. Singh



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