

# Syllabus for GEOS/GEOG 222 – Fundamentals of Geospatial Sciences

## 1. Course information:

Title: Fundamentals of Geospatial Sciences  
Number: GEOS 222  
Credits: 3  
Prerequisites: Sophomore standing; or permission of instructor.  
Location: Lectures and Labs in WRRB Computer Lab; Room 004  
Term: Every Fall  
Meeting time: Lectures: Tuesday and Thursday, 11:30 am to 12:45 pm  
Lab: Tuesday and Thursday, 12:45am to 1:30 pm

## 2. Instructor Information (Proposed):

Fall (Even Years – Geography-lead instructor)	
<u>Dave Verbyla</u> Office: O'Neill 366 Telephone: 907-4745553 Email: dlverbyla@alaska.edu Office hrs: ad hoc / by appointment	<u>Donald Atwood</u> Office: GI-206, UAF Telephone: 907-4747380 Email: dkatwood@alaska.edu Office hrs: ad hoc / by appointment
Fall (Odd Years – Geology-lead instructor)	
<u>Anupma Prakash</u> Office: WRRB-108E, UAF Telephone: 907-4741897 Email: prakash@gi.alaska.edu Office hrs: ad hoc / by appointment	<u>Donald Atwood</u> Office: GI-206, UAF Telephone: 907-4747380 Email: dkatwood@alaska.edu Office hrs: ad hoc / by appointment

## 3. Course readings/materials:

### Course text book:

*Remote Sensing of the Environment: An Earth Resource Perspective*, by John R. Jensen, Prentice Hall; Second edition (May 21 2006), 608 pages. ISBN-13: 978-0131889507

## 4. Course description:

This course provides students with an introduction to the principles and applications of geospatial science (remote sensing, GIS and GPS). Fundamental concepts include electromagnetic radiation, map reading, coordinate systems and projections, the physics of remote sensing instruments, reasoning and analytical skills, data formats, and other geospatial topics. Practical exercises including field data collection using GPS, photo-interpretation, digital image processing and GIS software exercises will reinforce theoretical discussions.

## 5. Course Goals and Student Learning Outcomes

Goal: The goal of this core course, required for the students seeking a degree with emphasis in remote sensing and GIS, is to introduce the students to the fundamental theoretical background and some practical applications of geospatial sciences. The course will prepare the students to take more advanced and specialized courses in remote sensing, GIS, GPS, and digital techniques in data analyses.

Student Learning Outcomes: By the end of the course, students will be able to

- *Understand* the fundamental principles in remote sensing imaging and geospatial data integration and analysis.
- *Search and download* relevant geospatial data required for a certain project/purpose.
- *Visually interpret* in a qualitative way a variety of images (optical, infrared, SAR) taken from airborne and satellite platforms.
- *Collect and import* GPS data using handheld recreational mode GPS units.
- *Project* digital data in different projection systems.
- *Compose* a simple cartographically sound map which integrates GPS data, with other geospatial data (vector data; raster maps and images).
- *Appreciate* how geospatial data can be applied in the real-world for hazard assessment, resource allocation, emergency management, change detection, and policy decision-making.

## 6. Instructional methods:

- 75 minute lecture followed by 45 minute lab, meeting twice a week.
- Lectures will be interactive and will involve use of power point presentations and group discussions. Course materials will be posted on the web.
- Laboratory component will include hands-on experience with available image processing software packages.
- Reading assignments will be an integral part of the course.

## 7. Course calendar:

See detail class schedule (attached)

## 8. Course policies:

Attendance in lectures and labs is essential. For some reason, if you cannot be present for a lecture or lab, please let us know in advance and make arrangements for make-up time. Missing one lecture and lab without prior permission from the instructor will result in a loss of 3 points (3% from your final grades).

Due dates for homework and lab assignments are fixed. Late work will be not be accepted without prior agreement with the instructor.

Make-up tests or deferral of late penalties will be permitted only with documented proof of illness or for compassionate reasons.

We do expect all students to abide by the UAF Student Code of Conduct (see: <http://www.uaf.edu/catalog/current/academics/regs3.html>)

## **9. Grading Policy:**

Your grades will be based on several factors as detailed below:

- 10%: Class participation (see course policy above)
- 20%: Lab assignments. Most labs require that you complete the lab work in class and submit the answer sheet that accompanies the lab instructions.
- 15%: Homework assignments based on the reading will be due weekly. Students need to answer the questions independently. Grading will be based on the completeness, comprehensiveness, and demonstrated understanding of the fundamental concepts and applications of geospatial sciences.
- 20%: Weekly quizzes. Quizzes assess comprehension of the reading and materials presented in the lectures. The format is short answers or multiple choice.
- 15%: Mid-term. Your mid-term will comprise of short questions/ multiple choice answers that you will complete in class as a 'closed-book' exam.
- 20%: Final exam. Will be a combination of multiple choice answers and an essay type answer on the topics covered throughout the semester.

Grading index followed in this class is given below (Numerical GPA equivalence of Grades as per University Regulation R10.04.09 are indicated in parenthesis)

96-100	= A+	(4.0)
92-95	= A	(4.0)
88-91	= A-	(3.7)
84-87	= B+	(3.3)
79-83	= B	(3.0)
75-78	= B-	(2.7)
70-74	= C+	(2.3)
67-69	= C	(2.0)
63-66	= C-	(1.7)
59-62	= D+	(1.3)
55-58	= D	(1.0)
51-54	= D-	(0.7)
50>/=	= Fail	

## **11. Disabilities Services:**

Should you have any special needs, please come and talk to us and we will work with you to accommodate your needs as best as possible. We will work with the UAF Office of Disability Services (208 WHITAKER BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.