#### THE DIGITAL EARTH

Geography 105 (GEOG105), Fall Semester 2017

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Lecture: Monday/Wednesday 2:20-3:35 PM, Callcott 302

Lab exercise (when assigned): details in schedule

Office: Callcott 319

Office hours: Tuesday/Thursday 3:00-4:00 PM, other times by appointment

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Office: Callcott 108

Office Hours: Tuesday 1:00-3:00 PM

**Bulletin Description (3 credits):**Introduction to geographic data; use of digital maps and aerial/satellite images as means of Earth observation; basics of spatial data analysis; location-based Web APPs; digital map services.

**Pre-requisites:  none**

**Course Description:** GEOG 105 is an introductory course that focuses on how the earth surface is visualized, explored, and analyzed in digital formats (e.g. maps, images, tweets). It provides a systematic introduction of map-based analytical approaches to understanding the Earth environment and human society. The topics cover the basics of cartography (map making and reading), aerial photography and satellite image interpretation, geographic information systems (GIS), and map-based reasoning and communication of spatial data. Students will learn fundamental concepts of digital geographic data to understand vast quantities of geographic information in our ever-changing world. Students will be exposed to leading edge trends in mapping technology – with examples from everyday life like GPS, web-based maps and smartphone APPs – as their practical experiences. **Although the subject matter is technically oriented, this class focuses on basic concepts and applications of each (the fun parts)**.

**Learning Outcomes:** Upon successful completion of this course students will be able to:

* Understand the basic concepts and principles in processing digital geographic data.
* Collect, map and analyze spatial data as a mechanism to understand our physical and social world.
* Make use of online resources of aerial photos, satellite images and maps in various formats.
* Think spatially and develop problem-solving skills with critical understanding of geographic context.
* Demonstrate the ability to reason and communicate using map-based technologies such as online maps, Google Earth, mobile GIS and web APPs.

**Textbook:**

Bradley A. Shellito, 2015. Introduction to Geospatial Technologies. 3rd Edition. W. H. Freeman and Company, a Macmillan Higher Education Company. (Highly recommended)

**Course presentation:**

Lectures: Primarily in a form of PowerPoint presentations. Usually a ***short-version*** lecture note (pdf) will be uploaded to Blackboard **prior to** each class.

Lab exercises: Exercises are usually due one week after assigned, although most students could complete in class. ***Late hand-ins are subject to a 5% reduction per week day. Void after 5 days.***

Quizzes: Pop-up quizzes related to previous lectures are given throughout the semester. No makeups unless you **e-mail** me your absence prior to the class.

Exams: This course has one session exam and one comprehensive final exam. All questions in the exams are covered in lecture notes and reading assignments. A brief study guide will be handed out prior to each exam. No makeups unless you **e-mail** me at least one day prior to the exam.

**Grading:**

Pop-up Quiz 5%

Exercises 25%

Middle term 20%

Review 20%

Final Exam: 30%

**Total score 100%**

The final score is a weighted sum of all categories above.

**The “Weighted\_Score” column has been assigned as the first column of your Grade Center at Blackboard.** It is automatically calculated by Blackaboard and will change with any new grades add in. The final grades are assigned based on your weighted score at the end of semester.

***A reference scale* under the USC Plus grading system*:***

Grade Score

A (4.0) 90-100

B+ (3.5) 85-90

B (3.0) 80-85

C+ (2.5) 75-80

C (2.0) 70-75

D+ (1.5) 65-70

D (1.0) 60-65

F (0.0) <60

Note: The grading scale is subject to change upon students’ performance in this semester.

**Course Management System:**

Blackboard: All students in the class can access *Blackboard* at the following URL: <https://blackboard.sc.edu>. It is each student’s responsibility to use *Blackboard* to access class materials. The *Blackboard* Help Desk can be reached at 777-1800.

E-mail: All students have been assigned a USC email account, usually in a form of [*lastname@email.sc.edu*](mailto:lastname@email.sc.edu) *.* This account is the default one used by *Blackboard*. If you prefer other email accounts, please update your email address at <http://blackboard.sc.edu>. It is your responsibility to set your email address correctly to receive messages in this class.

Computer Facilities:Students for this course will have access to computers in selected computer labs in the Geography Department. All software used in the exercises will be installed and accessible in the lab.

Classroom Behavior: The instructor sets the standard and the ground rules for behavior in the classroom. If there is anything during class that detracts from your ability to listen, work or learn, please speak to me privately. I expect you to adhere to the *Carolina Creed* with respect to personal and academic integrity. Please take time to read the creed at: <http://www.sa.sc.edu/creed/>.

Academic Responsibility:In the Academic Responsibility Code found in the *Carolina Community: USC Columbia Student Handbook and Policy Guide*, misrepresentation of your own work either through plagiarism, collusion, or data distortion is a serious breech of this code. Plagiarism is the taking of ideas, concepts, and written (published) words and representing them as your own. This includes materials that are published in hard copy form such as books and journals (or someone else’s term paper) as well as material downloaded from the Internet, without appropriate attribution and referencing of the copied passages (e.g. placing the copied material in quotation marks and providing the reference including the exact page number of the copied material). Plagiarism infringes on copyright protections and also is considered theft of intellectual property. In addition to being illegal, plagiarism is morally wrong. If you have any questions on what constitutes plagiarism, get a copy of the Carolina Community and/or talk to me. Collusion occurs when someone else writes (or dictates) portions of the assignment for you and you represent this as your own work. Data distortion is the intentional misrepresentation of data either through falsification, fabrication, or omission. If it is discovered that you have committed plagiarism, collusion, or data distortion on any assignment in this class, you may fail the course.

**GEOG105 Course schedule (subject to change):**

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| --- | --- | --- | --- |
| **Week** | **Date** | **Topic** | **Readings (subj. to change)** |
| **2** | Mon, 8/28 | Introduction and guidelines |  |
| Wed, 8/30 | Introduction to Digital Earth |  |
| **3** | Mon, 9/04 | **Labor Day Holiday (no class)** |  |
| Wed, 9/06 | Introduction to Geospatial Technologies |  |
| **4** | Mon, 9/11 | Where in the spatial world are you?... Shape of Earth (1) | Chapt2: 39-47 |
| Wed, 9/13 | Where in the spatial world are you?... Shape of Earth (2) |  |
| **5** | Mon, 9/18 | ***Lab1: Digital Earth (exploring Google Earth)*** |  |
| Wed, 9/20 | From Globe to Map: map projection (1) | Chapt2: 47-56 |
| **6** | Mon, 9/25 | From Globe to Map: map projection (2) |  |
| Wed, 9/27 | ***Lab2: Coordinates & position measurements*** |  |
| **7** | Mon, 10/02 | Matching your data to reference: Georeferencing | Chapt3:66-76 |
| Wed, 10/04 | ***Lab3: Georeferencing (MapCruncher)*** |  |
| **8** | Mon, 10/09 | Collecting your data: GPS | Chapt4: 89-100; 104-105 |
| Wed, 10/11 | **Middle term exam (1-7)** |  |
| **9** | Mon, 10/16 | **Exam review** |  |
| Wed, 10/18 | Exploring your data: GIS | Chapt5: 125-133 |
| **10** | Mon, 10/23 | ***Lab 4: GeoCaching (cellphone-GPS field lab)*** |  |
| Wed, 10/25 | ***Lab 5: Viewing spatial data in ArcGIS*** |
| **11** | Mon, 10/30 | Citizen Science: location-based service, web apps | Recommended reading online |
| Wed, 11/01 | ***Lab 6: Mobile GIS for field data collection*** |  |
| **12** | Mon, 11/06 | Geospatial cloud;  ***(Introduce GeoHIVE project)*** | Chapt.15: 520-530; |
| Wed, 11/08 | ***Lab 7: ArcGIS online*** |  |
| **13** | Mon, 11/13 | Digital Streets | 275-293 |
| Wed, 11/15 | **Review hand-in (400 words)** |  |
| **14** | Mon, 11/20 | **Guest speaker (TBD)** |  |
| Wed, 11/22 | **Thanksgiving (no class)** |  |
| **15** | Mon, 11/27 | Earth observations: aerial and satellite imagery (1) | Chapt9: 309-327;  Chapt10: 340-345, 352-357 |
| Wed, 11/29 | Earth observations: aerial and satellite imagery (2) |  |
| **16** | Mon, 12/04 | ***Lab 8: exploring satellite images*** |  |
| Wed, 12/06 | Class wrap-up |  |
| **17** | Exam Week | No class |  |
| No class |  |
| **18** | Dec 15th | **Final exam (week 1-17): 12:30 PM-3:00 PM** | |