Geography 168: Intermediate Geographic Information Systems  
(Summer 2014, Session C)  

Instructor: Nick Burkhart  
Office hours: Bunche 1127B, Tues./Thurs., 2pm – 3pm or by appointment  
Email: nickburkhart@ucla.edu  
Skype: nick.uclagis

Course Description: This course reinforces and introduces additional key geographic concepts and techniques related to the theory and application of geographic information systems (GIS). Topics such as geographic coordinate systems, geoprocessing, raster processing and analysis, digitizing, and various types of spatial analysis are given in-depth treatment during this intensive seminar. Spatial data literacy, data formats, and data manipulation practices are also emphasized. Students are trained in the use of both open-source (QGIS) and commercial (Esri ArcGIS) GIS software platforms. In addition to exposing students to the variety of settings and situations in which such GIS techniques are used, students will also learn how to implement such techniques. **GEOG 7 is an enforced prerequisite for this course.**

Course Delivery Method: This is an online course, wherein all course content is delivered online and all interaction among the instructors and the participants will take place online. However, because collaboration among course participants adds richness and value to the course, the course is not self-paced. We will follow the tentative schedule provided at the end of this document.

The course is divided in to ten content units, each of which contains (1) video lectures and screencasts, (2) external resources related to the unit, (3) at least one assignment, (4) a thematic forum, and (5) a unit quiz. At the beginning of every unit, you will review the posted content and submit the assignment(s) in advance of the posted deadlines. After completing the assignment(s), you will take a unit quiz. You must pass each unit quiz with a score of 70% or higher to proceed in the course. You may take unit quizzes as many times as you would like to earn the score you desire. Completion of a unit quiz unlocks access to the next unit’s content.

There is no formal text for this course; rather, course content will take a variety of forms and formats such as PDF readings, online content, screencasts and online videos. You are encouraged to take advantage of these and other resources that you have access to in order to get the most out of this course. This may mean watching a video more than once or finding an alternative resource. Please share any and all resources that you find valuable with others on the course forum to enrich the learning of others as well.

The online course format requires a significant amount of independent work and time management by the student. You will be given the structure, resources, and guidance for learning the course content, but it is ultimately your responsibility to complete assignments on time, to learn new methods when necessary, and to seek out and share information as needed to complete the course successfully.
Owing to the compressed timeframe of summer courses, students are encouraged to stay informed about the course by checking e-mails and announcements on the course Web site **several times per day** while the class is in session, and daily engagement with the course forum is encouraged and in some cases expected. While the course is in session, the instructor will regularly post short check-in messages outlining course activities and addressing common student concerns. Additional readings, forum discussions, and assignments will be posted online. Deadlines and due dates will be clearly posted with all assignments. All assignments must be turned in by their posted deadlines. Exceptions will be granted only under the most pressing of circumstances and must be discussed with the instructor in advance of the deadline.

All work and discussions are asynchronous, meaning that students are not required to be online at a specific time with the instructor or other students. Instead, students may post comments and questions on the course forums. Students may interact in real-time with other students via the course's persistent chat session, or with the instructor during office hours or by appointment.

The instructor's office hours are conducted both in-person and online. In-person office hours are held in Bunche Hall 1127B. During posted office hours, and in additional sessions arranged by appointment, the instructor will be available in person and online via Skype. Skype allows for text-based chatting, audio and video communication, screen sharing, and file transfer.

**Technical Requirements:** Because this online course will largely require that students use their own computer to complete coursework, the course is largely platform neutral. In other words, you are free to use your own computer/laptop with the operating system of your choice (e.g. Apple, Windows, Linux). The only technical requirements for this course are:

- A productivity software suite (LibreOffice is highly recommended and completely free, but Microsoft Office also is suitable);
- Desktop GIS software (QGIS and ArcGIS);
- Spatial analysis software (GeoDa);
- Virtualization software if your computer cannot natively run ArcGIS (VirtualBox is highly recommended);
- A licensed copy of Microsoft Windows (either paid or evaluation);
- A fast and reliable connection to the Internet.

**Running ArcGIS Desktop:** In addition to QGIS, which is used intensively in GEOG 7, this course requires that students install and use ArcGIS Desktop, an industry-standard desktop GIS software suite produced by Esri. **All students will be provided with a one-year evaluation version of ArcGIS Desktop at no cost.**

ArcGIS runs only on computers with x86 and x64-compatible processors running Microsoft Windows. This means that some new Windows 8 tablets cannot run ArcGIS, and it also means that Mac and Linux users will have to install Windows in order to run ArcGIS. If you are a Mac or Linux user, you have several options for installing and running Windows and
ArcGIS: (1) dual-booting your computer, which involves carving out a separate partition on your hard drive for Windows and ArcGIS, and (2) virtualization, which involves using specialized software to simulate another computer system. Virtualization is far easier, and should be used by anyone who is not already familiar with dual booting and disk partitioning. Oracle's VirtualBox is a free and open source virtualization platform that can be used to run Windows and ArcGIS on Mac or Linux computers. Students without a legal license of Windows should download a 90-day evaluation version of Windows directly from Microsoft.

**E-mail and communication protocol:** To ensure that questions are answered in a timely manner and to the benefit of all students, the following e-mail and communication protocols for the course have been established:

- Post questions related to the syllabus, course requirements, course organization, weekly assignments, and course content to the 'Discussion Forum' on the course homepage so everyone can benefit;
- Direct technical questions about access to the course Web site and Blackboard Collaborate to the Social Sciences Computing help desk;
- The subject line of all e-mails directed to Nick must begin as follows: [GEOG 168]
- All other questions, including questions about grading, should be directed via e-mail to Nick.

The Discussion Forum will be monitored continually on weekdays during the session and instructor responses, when necessary, will be posted within 24 hours of the original post.

**Evaluation Procedures:**

**Syllabus Quiz (5%)**: Under the Unit 0 section on the course Web site, there is a brief quiz to ensure that students understand course requirements and expectations. This quiz will count as 5% of your final grade. During the first week of class, you can take it as many times as needed to get the score you want.

**Forum Participation (10%)**: A total of 10% of your final grade will be based upon your participation in thematic fora. You will complete one thematic forum post per unit during the session, and every forum post will be due at 11:55pm on the same day that the unit's last assignment is due.

The general discussion forum appears on the main course Web site and serves as a repository of knowledge and a general point of contact for the course. Use the general forum to arrange working groups, share ideas and resources, and start discussions. Participation on the general discussion forum is highly encouraged, but is not graded.

The 'thematic' fora will be linked directly to, for instance, a reading or resource, and will serve as an online discussion about that topic in particular. The thematic fora will appear under a unit section, will have a posting deadline, and a minimum posting of no less than 200 words. Forum postings are required to be written in complete sentences with correct spelling and grammar. Civil debates and discussion are encouraged and expected in all fora. Any inflammatory or derogatory postings will not be tolerated, and all postings will be moderated for proper “netiquette”. Any attacks, flaming, or inappropriate commentary or
postings will be removed and result in no credit for this segment of the course.

**Unit quizzes (10%)**: Each unit will conclude with a short quiz that will test your content knowledge and expertise. These unit quizzes may be taken as many times as you would like to earn the score that you would like to earn, in advance of the unit’s final assignment deadline. A score of 70% or higher on every unit quiz is required to unlock access to the next unit’s content.

**Assignments (50%)**: Every unit will contain at least one exercise/assignment that reinforces the content from the unit. For every assignment, unless otherwise specified, you will (1) create a PDF document containing all required assignment materials and then (2) upload and submit the file to the course Web site (i.e. Moodle) in advance of the specified deadline. Assignments will be evaluated on the basis of completeness, quality, demonstration of subject and/or technique mastery, creativity, and uniqueness.

**Final project (25%)**: You will create a project that incorporates a substantial set of the techniques and methods that you learned over the course of the summer session. You will submit both a written document (incorporating maps and visualizations as needed) and a 3 to 5 minute screencast that discusses your project. Your project will be evaluated on its overall presentation, style, purpose, complexity, creativity, design, quality, and legibility, among other things. All project topics must be approved by the end of Week 5. It is never too early to begin thinking about your final project.

**Late Assignments**: For each 6 hour period that an assignment is late, beginning immediately after the deadline passes, your score for the assignment will be adjusted downward by 10%. Work that is more than 48 hours late will NOT be graded and will receive a score of zero. Extensions are granted only under the most pressing of circumstances.

**Collaboration, Originality, and Plagiarism**: Students in GEOG 168 are encouraged to collaborate with one another in reviewing course material and working on assignments. However, every student must turn in an original, unique, and individual creation for every assignment; students working together may not submit the same work. If you collaborate with another student in working on an assignment, you must cite your collaborators by providing their names either within the assignment you submit or alongside the link that you submit to the course Web site.

Please keep in mind that representing the work of another person (whether a fellow student or an outside source) as your own constitutes plagiarism. Plagiarism constitutes academic dishonesty and all instances of plagiarism will result in serious consequences for the offending student. A first offense will result in a score of zero being awarded for the offending assignment, and a second offense will result in more serious consequences to be determined by the instructor, including failure of the course and/or referral to the Dean of Students.
Course Content Outline*

Before class begins - Week 1
  • Unit 0: Preliminaries and Introductions

Week 1
  • Unit 1: Introduction to ArcGIS / Searching for Spatial Data

Week 2
  • Unit 2: Data Collection, Formats, Conversions, and Visualizations
  • Unit 3: Raster Georeferencing

Week 3
  • Unit 4: Digitizing and Editing of Vector Data
  • Unit 5: Geoprocessing – Overlay Analysis

Week 4
  • Unit 6: Map Algebra – Raster Calculator
  • Unit 7: Surface Analysis and Interpolation

Week 5
  • Unit 8: Raster Operations: Focal, Neighborhood, and Zonal Filtering
  • Unit 9: Spatial Statistics: ESDA / Spatial Autocorrelation

Week 6
  • Unit 10: Final Project

*Course content may vary or be adjusted in order to meet the needs of the class. The instructor reserves the right to adjust the schedule or amend the content of this syllabus at any time.