DEPARTMENT: INFO

COURSE NUMBER: 532  SECTION NUMBER:

CREDIT HOURS: 4.0  SEMESTER: Fall 2020

COURSE TITLE: Geographic Information Systems

CLASS HOURS AND LOCATION:  MW 10:00am-11:50am

INSTRUCTOR NAME: Lance Waller, PhD

INSTRUCTOR CONTACT INFORMATION

EMAIL: lwaller@emory.edu

COURSE DESCRIPTION

This is a semester-long course required for Public Health Informatics students and an elective course for other programs. It is offered both in the Fall (and occasionally Spring) semester. This course is taken by 1st year Public Health Informatics students, but can be taken by both 1st and 2nd year students in other programs.

Prerequisite: Experience with Windows-based computing is essential as a prerequisite for the successful completion of this course.

Brief description: The course introduces the use of geographic information systems (GIS) in the analysis of public health data. We develop GIS skills through homework, quizzes and a final project, and particularly address map layouts, visualization, and basic GIS operations such as buffering, layering, summarizing, geocoding, digitizing and spatial queries in addition to network analysis, raster analysis and working with real data.

CONCENTRATION COMPETENCIES:

<table>
<thead>
<tr>
<th>INFO Concentration Competencies assessed</th>
<th>Representative Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess individual data elements and display results effectively and appropriately</td>
<td>Labs</td>
</tr>
</tbody>
</table>

EVALUATION
Final Grade cutoffs will be no stricter than:
A: 96% +  
A-: 92% +  
B+: 89% +  
B: 85 +  
B-: 80+  
C: 70+  
F: Less than 70%

COURSE STRUCTURE: TBD

COURSE POLICIES

Lab manual: Lab tutorials will be posted on Canvas.

Required readings: Readings will be available on Canvas.

Evaluation methods:

ArcGIS Software: Labs involve guided exercises using ArcGIS. Emory has a site license for ArcGIS and you should be able to have it installed on any Emory computer. This type of request goes through the main university IT. For personal use of students, staff & faculty, please see Dr. Clennon as we have 1-year trial licenses from ESRI for educational use available. All support for this ArcGIS version must go through Dr. Clennon, not IT. Note: The software runs on Windows. Students using Macs will either need to use the Citrix environment or install the Windows version under Parallels or another Windows format for Mac.

Labs: Each lab requires a PowerPoint containing the created maps, answers to questions and tables which are to be submitted to us via Canvas. Each lab is due before the beginning of the following lab period. The network clock of the university is the standard of time. Remember, assignments may be slow uploading depending on your connection, and it is the time that it is finished uploading that Canvas records your assignment submitted. Late assignments will not be accepted except under special circumstances (death in the family, documentable illness, travel for work, etc...). While each student must submit his or her own homework assignment, discussion among students on homeworks is encouraged for clarification of assignments, technical details of using software, and structuring major steps of solutions.
Important about Lab Grading:
Grading of homeworks will become more stringent as the semester progresses, and the class has been introduced to new materials and has covered new skills. Thus, what may be a warning or minor deduction in an early lab can become a more major deduction. Reviews of assignments/quizzes for grading errors are done in their entirety, not merely question by question. If an error(s) is found, this may result in a score increasing or decreasing. All grading reviews are conducted solely by Dr. Clennon, and only she may make a grade change.

Quizzes: There will be 3 quizzes. The exam will include questions covering the regular lectures, pre-lab lectures and readings. Because class attendance is expected, questions may include material covered in class or lab that is not posted on slides. Be aware, that lectures are generally not recorded. Quizzes will include material from previous ones as well as recently covered material. Helping or receiving help from other students during the quizzes from fellow other people will be considered an honor violation. Quizzes may include multiple choice, short answer, matching, true/false, and fill-in-the-blank. Two chances will be given for each quiz, however, incorrect questions will not be identified as the nature of true/false and multiple choice questions allow easy identification of correct answers. Quizzes will, however, be reviewed in class. If you would like to review your individual quiz with Dr. Clennon, please make an appointment.

In reference to the labs, quizzes and other graded tasks, cheating is strictly forbidden and includes but is not limited to: plagiarism, submission of work that is not the student's own, submission or use of falsified data, unauthorized access to assignment solution, supplying or communicating unauthorized information for an assignment/exam.

Please, if you are registered with the Office of Accessibility Services, come see me early in the semester rather than later on, so that we may proactively make any arrangements that may be needed. If you are color blind especially if you are more than red-green, you may want to let me know so that I can adjust the quiz on color and visualization as needed as well as help guide in the use of color codes, texture, or grey scale.

Class attendance and participation

You are expected to attend all class meetings. Please, let the instructor know if you cannot make it to a class (and provide a valid justification for your absence). Attendance means arriving on time, working on class materials appropriate for the session, not departing early and no checking email, playing computer games, texting, etc. during class. Participation will include questions to speakers, active participation in the discussions before and following the seminars and timely completion of the computer labs.

Final project

For the final project, you will pose a substantive question related to public health, develop appropriate methods and data, perform an analysis, and report your results.
both in a paper and as an oral presentation. Application of methods to your own spatial data (when available) is encouraged. Spatial datasets will be provided by the instructor for students who do not have their own data. Students cannot change datasets without permission after October 3rd. Further details will be provided in class. Those final project reports with sources without restating the material in the student’s own words or just cut & pasted from websites, journals or other materials will not be graded and receive a zero for the project.

Additionally, references must be cited for background information, and those citations must be from scientific books or articles that can be found using either PubMed or GoogleScholar. A 15% deduction will be made for having citations that cannot be found. The use of Wikipedia is strictly forbidden (30% deduction). Additionally, websites of CDC, WHO and other medical organization are not permitted to be used (these should not be in the citations at all) to cite text, although their publications (e.g. MMWR, EID, WHO Bulletins) are permitted to be used. Websites can and should be cited for where you obtained data.

The Final Project will include an introduction with background and objectives, methods which includes a table listing all the data files used and where they are from (e.g. source name & internet link or RSPH drive folder) and the data cleaning steps and GIS processes you conducted, results (maps, interpretation of maps, tables, statistics, etc…), discussion & conclusions (including importance of findings, pro and cons of the data & analyses, etc…).

RSPH POLICIES

Accessibility and Accommodations

Accessibility Services works with students who have disabilities to provide reasonable accommodations. In order to receive consideration for reasonable accommodations, you must contact the Office of Accessibility Services (OAS). It is the responsibility of the student to register with OAS. Please note that accommodations are not retroactive and that disability accommodations are not provided until an accommodation letter has been processed.

Students who registered with OAS and have a letter outlining their academic accommodations are strongly encouraged to coordinate a meeting time with me to discuss a protocol to implement the accommodations as needed throughout the semester. This meeting should occur as early in the semester as possible.

Contact Accessibility Services for more information at (404) 727-9877 or accessibility@emory.edu. Additional information is available at the OAS website at http://equityandinclusion.emory.edu/access/students/index.html
Honor Code

You are bound by Emory University’s Student Honor and Conduct Code. RSPH requires that all material submitted by a student fulfilling his or her academic course of study must be the original work of the student. Violations of academic honor include any action by a student indicating dishonesty or a lack of integrity in academic ethics. Academic dishonesty refers to cheating, plagiarizing, assisting other students without authorization, lying, tampering, or stealing in performing any academic work, and will not be tolerated under any circumstances.

The RSPH Honor Code states: “Plagiarism is the act of presenting as one’s own work the expression, words, or ideas of another person whether published or unpublished (including the work of another student). A writer’s work should be regarded as his/her own property.” (http://www.sph.emory.edu/cms/current_students/enrollment_services/honor_code.html)
COURSE CALENDAR

*Note:* Due dates and lecture topics are tentative and subject to change depending on potential college-wide computer issues related to Citrix as well as class progress.

<table>
<thead>
<tr>
<th>Lecture - Monday</th>
<th>Lab - Wednesday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug 29: Map Elements, File Structures, Unzipping</td>
<td>Sep 3: No Class</td>
</tr>
<tr>
<td>Sep 5: Map Projections</td>
<td>Sep 10: Visualization</td>
</tr>
<tr>
<td>Sep 12: Visualization</td>
<td>Sep 17:</td>
</tr>
<tr>
<td>Sep 19: Geocoding</td>
<td>Sep 24: Digitizing &amp; Remote Sensing</td>
</tr>
<tr>
<td>Sep 26: Digitizing &amp; Remote Sensing</td>
<td>Oct 1:</td>
</tr>
<tr>
<td>Oct 3: Basic Spatial Analysis</td>
<td>Oct 8: No Class</td>
</tr>
<tr>
<td>Oct 10: Reprojecting Data Layers &amp; Final Project Work Time</td>
<td></td>
</tr>
<tr>
<td>Oct 15:</td>
<td>Oct 17: Final Project Work Time</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>• Quiz 3 due before class (covering material through Basic Spatial Analysis/MAUP)</td>
<td></td>
</tr>
<tr>
<td>• Quiz Review</td>
<td></td>
</tr>
<tr>
<td>• Data Sources</td>
<td></td>
</tr>
</tbody>
</table>

|-------------------------------|---------------------------------------|

<table>
<thead>
<tr>
<th>Oct 29: Network Analysis &amp; Allocation Analysis</th>
<th>Oct 31: Lab 6- Allocation Analysis &amp; Network Analysis</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nov 5: Accessibility Analysis</th>
<th>Nov 7: Lab 7 - Accessibility Analysis &amp; Network Analysis</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nov 12: Human Movement, Raster Analysis</th>
<th>Nov 14: Lab 8 - GPS, Raster Analysis</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nov 19: Final Project Office Hours</th>
<th>Nov 21: Final Project Work Time</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nov 26: Raster Analysis (Landcover)</th>
<th>Nov 28: Lab 9 - Raster Analysis I (Landcover)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dec 3: Modeling with Raster Data</th>
<th>Dec 5: Raster Analysis II (Hydrology)</th>
</tr>
</thead>
</table>

| Dec 10: Final Project Office Hours |  |
|-----------------------------------|  |

| Dec 14: Final Projects Due @ 11:59pm |  |