GIS3 - GEO420 - ADVANCED GEOGRAPHIC INFORMATION SYSTEMS

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MISSION OF THE GEOGRAPHY-EARTH SCIENCE DEPARTMENT
The Geography-Earth Science Department is committed to student learning and personal development through innovative teaching, high quality field application, and the use of geotechnology in all aspects of our programs. These commitments will deepen students’ appreciations of Geography-Earth Science, encourage life-long learning and enable majors to enter a geography or earth science related professional career, to teach at the middle or secondary level, or to pursue an advanced degree.

PURPOSE OF THE COURSE
The purpose of GIS3 is to provide students with a project-based capstone experience in the field of Geographic Information Science & Technology. This course was designed to help students advance their understandings and skills with geospatial data and technology – it is not for beginners. GIS3 is cross-listed among several undergraduate and graduate degree programs, it is a required course for Geography majors following the GIS track, and serves as one of six courses that can be used to satisfy the elective component of the undergraduate GIS Certificate Program.

COURSE LEARNING OBJECTIVES
By the end of this course, students will have: become familiar with the process of performing data analysis in a geocomputational environment; developed some proficiency with GIS-related tools (e.g., ESRI ArcGIS Pro 2.2, ArcGIS Desktop 10.6, ArcGIS Online, Python, spreadsheets, etc); and become familiar with current trends in the geotechnology arena. To successfully complete this course, each student must demonstrate that s/he has the abilities to: ask a research question with a conspicuous geographic component, identify necessary and sufficient objectives, select appropriate methods and data, perform spatial analysis, and document and present the answer to the originating question.

REQUIRED TEXTS

Helpful but not required

The writing resources and citation guide offered by the Department of Geography-Earth Science https://www.ship.edu/Geo-ESS/Writing_Resources/
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**THE RELATIONSHIP BETWEEN READING ASSIGNMENTS AND CLASS TIME**

Every assigned reading (look for the textbook references in each lab handout) has been chosen because it is relevant and necessary to help you develop your understanding of new spatial thinking concepts, mapping skills, or data analysis techniques. Students are expected to complete every reading assigned. A reading is considered complete only when understanding is achieved. The ‘gist’ is not good enough.

A series of short in-class lectures with exercises has been developed to clarify fundamental concepts, skills, and techniques covered by the text and to cover emerging topics not covered by the text (technology changes quickly). Lectures support the readings; they don’t duplicate them. All terms, concepts, and techniques covered by the readings, lectures, in-class exercises, or take-home lab assignments are subject to examination.

**LAB REPORTS (THREE @ 40 PTS EACH; 120 PTS TOTAL)**

This course is a methods course. Accordingly, much of our time will be spent working through short in-class exercises and longer out-of-class lab assignments. Four labs will be assigned and discussed in class. Students are responsible for bookmarking the course website, printing (or downloading) a copy of each handout, completing each assignment outside of class, and submitting a well-written report. Due dates and the rubric I use to assess reports are posted on the course website. Each report will receive a score between 0 and 40 pts based, again, on the usual rubric.

**LAB QUIZZES (THREE @ 10 PTS EACH; 30 PTS TOTAL)**

Each lab will be followed by a quiz that assesses student comprehension of the concepts explained by the assigned readings and the skills/tools practiced during the lab.

**THE CAPSTONE GIS PROJECT (150 PTS)**

Each student is expected to initiate, complete, and report a capstone-quality GIS project. A typical capstone project involves: a) asking a question that has a conspicuous geographic component; b) identifying the pieces of information needed to answer the question; c) selecting appropriate methods (GIS-related and otherwise) and data; d) analysis and interpretation of results; and e) presenting the project to the class and faculty members in the department. The capstone GIS project will be discussed in greater detail during class.

**GRADUATE STUDENT EXPECTATIONS FOR THE CAPSTONE GIS PROJECT (50 PTS)**

Graduate Students are expected to further develop the research skills they learned in GEO503: Fundamentals of Geoenvironmental Research. Specifically, graduate students are expected to query and consult the bodies of peer-reviewed published literature that pertain to: 1) the topic of their research question (at least two articles); and 2) the GIS methods others have used to accomplish similar research objectives (at least two articles). Full citations to all articles used and all datasets used should be added to your Zotero database. Undergraduate students may choose to meet these same standards and earn innovation points (see below) for doing so.

**PROFESSIONALISM (50 PTS – CREDIT GOES TO DRS. ALICE ARMSTRONG & CAROL WELLINGTON)**

You are expected to perform in this course as you will be expected to perform in the workplace; professionally. The purpose of your Professionalism score is to help you understand how an employer forms an opinion of you. When hired, your employer will be excited and have high hopes for you. Each time you disappoint (clients, shareholders, peers, a boss, etc.), however, your reputation will tarnish, which in turn will affect your prospects within your company or agency. Like that initial high hope, your professionalism score for this course starts high (at 50 pts); it can stay that high or it can go down; your professionalism score can even turn negative. The table below identifies professional behaviors sought by employers and the unwanted behaviors that will negatively affect your score.

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Table 1. Professional behaviors and contraindications with negative impacts.

<table>
<thead>
<tr>
<th>Expected professional behavior</th>
<th>Contraindication</th>
<th>Impact</th>
</tr>
</thead>
</table>
| I show up on time and am prepared every day.                    | 1. Each excused lateness or absence.  
2. Unexcused lateness to class.  
3. Printing a lab report as or after class begins on the day it is due.  
4. Failing to bring your textbook(s) or memory device to class.  
5. Each unexcused absence from class.  
6. Sends e-mail messages that do not include subject lines, greetings, or signatures; or that uses non-standard English.  
7. Unexcused absence from a scheduled appointment (with me or with your peers).  
8. Unexcused absence from a class that results in a late group assignment or a missed group presentation. | -1 pts   |
| I communicate well with my colleagues and management.           | 9. Failing to back up your data/memory device.                                                                                                                                                                     | -5 pts   |
| I plan ahead for unusual or unexpected outcomes.                | 10. Cheating or plagiarizing another’s work.                                                                                                                                                                    |          |
| I work with honesty and integrity.                              | In addition to losing the point value of the report or exam, lose an equal amount of professionalism points.                                                                                                  |          |
| I serve as a positive role model.                               | 11. Disruptive, rude, intolerant, or cruel acts.                                                                                                                                                                 | -1 to -10 pts |

GRADING SCHEDULE

Your final grades will be derived from the share of course points that you earn (see Table 2). Scored activities (points) include: professionalism (50pts), lab reports (120 pts), lab quizzes (30 pts), and one capstone GIS project (150, 200 pts).

Table 2. Schedule of course points and final letter grades for undergraduate (UG) and graduate (GR) students.

<table>
<thead>
<tr>
<th>UG course points</th>
<th>GR course points</th>
<th>min %</th>
<th>Letter grade</th>
<th>Quality points</th>
</tr>
</thead>
<tbody>
<tr>
<td>326</td>
<td>350</td>
<td>93</td>
<td>≤ A</td>
<td>4.0</td>
</tr>
<tr>
<td>315</td>
<td>325</td>
<td>90</td>
<td>A-</td>
<td>3.7</td>
</tr>
<tr>
<td>305</td>
<td>314</td>
<td>87</td>
<td>B+</td>
<td>3.3</td>
</tr>
<tr>
<td>294</td>
<td>304</td>
<td>84</td>
<td>B</td>
<td>3.0</td>
</tr>
<tr>
<td>284</td>
<td>293</td>
<td>81</td>
<td>B-</td>
<td>2.7</td>
</tr>
<tr>
<td>273</td>
<td>283</td>
<td>78</td>
<td>C+</td>
<td>2.3</td>
</tr>
<tr>
<td>245</td>
<td>272</td>
<td>70</td>
<td>C</td>
<td>2.0</td>
</tr>
<tr>
<td>217</td>
<td>244</td>
<td>62</td>
<td>D</td>
<td>1.0</td>
</tr>
<tr>
<td>&lt; 217</td>
<td>&lt; 248</td>
<td>&lt; 62</td>
<td>F</td>
<td>0.0</td>
</tr>
</tbody>
</table>

INNOVATION (50 PTS)

I am offering each student up to 50 bonus points for his or her innovative attempts to solve spatial problems, regardless of success or failure. To be clear, these points are not available to the student that pursues the course as it is written, but to those that push themselves beyond what is required AND who can demonstrate that they’ve done so. Students may consult other texts, help menus, online user groups, or attend office hours to learn more – that’s natural and that’s strongly encouraged. I reserve all discretion on how these extra innovation points are awarded, but will always listen to your advice if you offer it.
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COMMENT AND DISCLAIMER
The set of schedules, policies, and assignments described in this syllabus is subject to change in the event of an extenuating circumstance or by agreement between the instructor and students.

GENERAL POLICIES
Students are expected to behave with manners that support a positive learning environment.

- Accommodations – Students with learning needs that are registered with the Office of Accessibility Resources are strongly encouraged to talk with me and to advocate for themselves.
- Tardiness - Students are expected to arrive prepared for class before class begins. Arriving to class late is a distraction to all. If you must arrive late, then enter the room in the least disruptive manner.
- Absences – Students will get the most value for their tuition dollar by attending all classes, completing all assignments, asking questions, and leveraging office hours. All sickness, death, or other long term absences must be reported to your college Dean (most of you are in the College of Arts and Sciences), who will in turn alert all of your professors.
- Eating - Students are expected to not eat meals during class; other places and times are more appropriate. To protect our equipment, liquids (e.g., coffee, tea, soda, etc.) may NOT be consumed in the computer lab.
- Distractions - All electronic communication devices must be silenced before class begins. All electronic communication and data sharing devices must be silenced and stowed out of sight during quizzes or exams. Any student that fails to silence or stow such a device during a quiz or exam, even unintentionally, might forfeit his or her quiz or exam.
- Assignment deadlines - Completed assignments are due at the beginning of class on the specified due date (see the course Schedule online). For reasons of fairness and efficiency, late assignments will not be accepted and will be scored with zero points. Rare exceptions will be granted only when matters of dire personal emergency arise or for reasons that are documented properly (see “Absences” above). If you anticipate a problem submitting an assignment on time, then see me as soon as possible BEFORE the scheduled class or due date so we can adapt. In short, ask for permission, not impunity.

SHIPPENSBURG UNIVERSITY POLICY RE: INCIDENTS OF SEXUAL VIOLENCE
Shippensburg University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972, the University requires faculty members to report incidents of sexual violence shared by students to the University’s Title IX Coordinator. The only exceptions to the faculty member’s reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report allegations of sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred. Such reporting must be made to the Shippensburg University Police at 477-1444, the Department of Human Services (DHS) at 800-932-0313, and the University’s Office of the Vice President of Student Affairs at 477-1308. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence can be found at
https://www.ship.edu/No_More/Sexual_Misconduct/Sexual_Misconduct_Information/
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SHIPPENSBURG UNIVERSITY POLICY RE: ACADEMIC HONESTY

All students are expected to know and understand the Academic Policies and Procedures described in the Shippensburg University Student Handbook (SWATANEY), particularly the sections regarding class attendance and academic dishonesty. Each student is also expected to understand his or her responsibilities and safeguards as outlined by the US Family Educational Rights and Privacy Act (FERPA), which requires all academic institutions to treat student academic records as confidential.

Shippensburg University expects academic honesty from every student; academic honesty is crucial to the integrity and reputation of the University. Conversely, academic dishonesty undermines the very basis upon which a community of scholars and learners functions. The term academic dishonesty means deceit or misrepresentation in attempting (successfully or unsuccessfully) to influence the grading process or to obtain academic credit by a means not authorized by a course instructor or university policy. Academic dishonesty is committed by students who give, as well as receive, unauthorized assistance in course and laboratory work and/or who purposefully evade or assist other students in evading the university’s policy against academic dishonesty. Academic dishonesty includes:

- Bribing, or attempting to bribe, faculty or staff in order to attain an unfair academic advantage.
- Possessing course examination materials prior to administration of the exam by the instructor without the instructor’s consent.
- Using unauthorized materials or devices such as crib notes during an examination.
- Providing and/or receiving unauthorized assistance during an examination.
- Using a substitute to take an examination or course.
- Allowing others to conduct research for you or to prepare your work without advance authorization from the instructor, including, but not limited to, the services of commercial term paper companies.
- Plagiarism, as the term is defined in the Shippensburg University Student Handbook: SWATANEY (see below).
- Intentionally and without authorization falsifying or inventing any information or citation in an academic exercise, such as making up data in an experiment or observation.

The Geography-Earth Science Department uses the “partial inline citation and full end citation” system used by the Council of Science Editors, which is generally accepted by natural and social scientists (e.g., Bolstad, 2016; Kimerling et al., 2011). Students earning degrees in Geography, Geoenvironmental Studies, or Sustainability are encouraged to review the writing resources @ https://www.ship.edu/Geo-ESS/Writing_Resources/ Students in other majors (e.g., Buisness, Criminal Justice, etc.) are encouraged to continue using the citation system they were taught to use (e.g., MLA, APA, etc.) by their home department. Giving credit to whom credit is due is really what’s important.


Plagiarism

Plagiarism is the unacknowledged use of another’s words, facts, data, images, propositions, or materials in your work; it is a form of academic dishonesty. When you must use another’s words, facts, data, images, propositions or materials, then you must cite your source and, when appropriate, put the exact words or phrases inside quotation marks. In other words, give credit to whom credit is due. Failure to do so can be considered plagiarism.
Student name (print): ________________________________

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AGREEMENT OF UNDERSTANDING

I have read and I understand the purpose, learning objectives, assessment methods, and policies described in this syllabus.

I have read and I understand Shippensburg University’s policies regarding sexual violence, student academic record confidentiality, and academic honesty. I know I can revisit these policies any time I want for they are available in the Shippensburg University Student Handbook: SWATANEY and posted on the Shippensburg University website.

I understand that any form of academic dishonesty (e.g., cheating, fabrication, falsification, forgery, multiple submission, plagiarism, complicity or computer misuse), whether successful or unsuccessful, will be penalized with: 1) the loss of the full point value of the assignment in question and an equal loss of Professionalism points; 2) an "F" letter grade for the course; or 3) in a manner to be determined via Shippensburg University’s formal resolution policy.

I understand that all of my electronic devices that are capable of communicating or sharing data (e.g., laptops, tablets, smart watches, mobile devices, etc.) must, unless I am given permission by the professor, be silenced before each class begins. I also understand that these items cannot be used during exams. If I fail to silence or stow any such device during an exam, then I will forfeit my exam and receive zero (0) points for it.

Student signature_________________________________________ Date__________________________________________

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