INSC 516-001/002  
Geospatial Technologies – Fall 2019  
Wednesday, 6:30 – 9:10 PM EST  
Zoom Course ID: https://tennessee.zoom.us/j/739218534  
Dates of Semester: August 21 – December 12

Instructor: Dr. Wade Bishop  
Office: 454 Communications Building  
Availability: Office Hours, Tuesday, 8:00-9:00 AM  
Contact: wade.bishop@utk.edu

Course Description:  
(3) Explores the creation, distribution and growth of geospatial data, highlighting their uses and misuses. Structured as an applications-based course where students learn how geospatial technologies are used to turn geospatial data into maps, tables and imagery through hands-on exercises and laboratory work.

Prerequisites:  
None.

Background:  
This elective was developed for the Geographic Information Librarianship project (GIL) with funding by the Laura Bush 21st Century Librarian Program Grant via the Institute of Museum and Library Services (IMLS) in their “programs to build institutional capacity” category.

Learning Outcomes:  
At the conclusion of this course students will be able to:  
- Explain the basic nature, characteristics, specification, types, acquisition, processing, organization and management of geospatial data in a geographic information system;  
- Describe, select and apply the basic functional and analytical capabilities of GIS;  
- Organize and visualize spatial data in ArcGIS; and  
- Describe and explain pertinent policy issues relating to the use of GIS in the public and private sectors.

Course Materials:  
Book:  
099854776X 9780998547763

Required Software:  
QGIS is open source software. There are versions for Windows, Mac, and others.  
Download the most recent version of QGIS—Zanzibar. (https://qgis.org/en/site/forusers/download.html)

Not required software:  
UTK OIT has ESRI ArcGIS Desktop, Engine, Mobile, Server. For this class, you don’t need any of them. You may download via UTK OIT (https://oit.utk.edu/software-hardware/software/) if you would like to also access and use this proprietary software. The instructions to download from OIT are straightforward and located on the website after you select the file. Part of the download process is contacting OIT and asking for the verification file to be sent to you. Again, YOU will NEED to call OIT (865-974-9900) or email them through their site.
Note: Apple users will need to run Windows for ArcGIS to work (BootCamp; Parallels) visit ESRI support pages for more information (http://edcommunity.esri.com/software-and-data/mac-os-support). The ESRI software only works on Windows. Call OIT if you need assistance with that.

Information Technology Expectations:
Although this elective does not require any pre-requisites, in past versions of the course students suggested the IT skill expectation be more clearly stated and links to remedial tutorials provided (if needed). You may use other software than GIS in this class. You might use Excel, Adobe Reader, and other software to create your final project. You will use something to capture screen shots for tutorials and labs.

If you have not used Excel or have another spreadsheet software, you should familiarize yourself with this technology: https://oit.utk.edu/Training/Pages/default.aspx

- Go to Excel
- Take the Microsoft Course
- Log-in
- Take Excel courses, skip over basics if not needed. The book explains exactly what to do, but if Excel is new to you please consider taking the courses through OIT.

You will be asked to submit screen shots of assignments. This means you should know how to hit PrtScn and copy and paste into any image software, or use a snipping tool.

Editing maps for your final project will look more professional in other software (e.g., Adobe Illustrator or other software).

Reading Materials:
Further scholarly and professional readings will be provided each week in advance of each class. Each student will be responsible for completing the readings and contributing in class discussion board activities and meetings. Reading materials outside of the required texts will be available on the Canvas course site.

Grades:
At the end of the course, I will convert the points earned into a percentage:

- 93% and above = A
- 85% to 92% = B+
- 79% to 84% = B
- 75% to 78% = C+
- 70% to 74% = C
- 60% to 69% = D
- below 60% = F

Incomplete—A temporary grade indicating that the student has performed satisfactorily in the course, but, due to unforeseen circumstances, has been unable to finish all requirements. An "I" will not enable a student to do additional work to raise a deficient grade. All incompletes must be removed within one semester, excluding the summer term.

Assignments and Evaluation Criteria:

Format: All assignments should be typed and turned-in via Canvas.

- Labs 120 points (40%)
- Exam 1 45 points (15%)
- Exam 2 45 points (15%)
- Research Proposal and GIS Project 90 points (30%)
- TOTAL 300 points (100%)

**Note: All assignments, including labs, are due on the day posted by 11:59pm**.
Penalty for Late Work
10 points per business day may be deducted for work not submitted by class time on the due date.

Labs (40%): There will be twelve labs during the semester (10 points each). These are the work in each chapter. Please be aware that some chapters have as many as 4 or 5 steps and when possible screen shot the last step of all of them. No late labs will be graded due to rigorous schedule, but you may work ahead.

Penalty for Late Work
10% of the grade per business day may be deducted for work not submitted by class time on the due date.

Exams (30%): There will be two exams in this class, consisting of essay and application questions that are designed to evaluate your comprehension of GIS concepts as they relate to our class discussions, labs, and your reading.

Research Proposal and GIS Project (30%): Do not ask me what I want your research project to be about. This is an opportunity for you to select a topic that interests you! A one-page proposal of your paper is due by 9AM on Feb. 1st. This proposal is worth 12 points. The proposal should be written in sentence form (not an outline) and should contain the following:

1. Select and describe a topic, with a working title, brief description of what you plan to investigate, how you plan to investigate, a hypothesis of what you expect to find, and literature review for consideration (at least 5 sources). Please provide a description of how you will get the data to do your analyses. Pick a topic that will benefit your future and that you will enjoy.

The remaining points for the assignment results from these items outlined in the rubric below:

2. Find research articles (peer-reviewed) on the topic, and use your interpretation and evaluation of the research to inform important aspects of the future of geographic information related to your topic; DO NOT simply summarize what has been researched, but relate the research articles to each other and synthesize a theme out of the articles you find. Each topic will have a different number of key articles, but for a final paper this length I expect ~20-30 citations.

3. Discuss future implications for the field related to your topic and specifically for your career.

4. Finally, you will prepare a 15 minute presentation of your paper to inform the class.

5. As a semester long assignment, I have high expectations for the quality of this work. You should produce a project that is of publishable quality. I am indifferent about structure or citation style; however, be consistent and do not hesitate to ask for clarification. In fact, you may want to take this opportunity to produce work that would lead to an actual presentation, paper, or poster. Many have been used in ePortfolios.

To give full attention to the paper, please produce at least 4,000 words of content. The following rubric should be used:
<table>
<thead>
<tr>
<th>IS 516: Rubric</th>
<th>12</th>
<th>8</th>
<th>4</th>
<th>0</th>
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<tbody>
<tr>
<td><strong>Purpose</strong> (Due Sep 11)</td>
<td>The author presents the topic, with a working title, a brief description of an investigation plan, with how investigation will occur and how the data will be found/collected, and a hypothesis of what you expect to find, and also a literature review for consideration (at least 5 sources).</td>
<td>The author presents the topic, with a working title, a brief description of an investigation plan, but fails to include all other required details.</td>
<td>The author presents the topic, with a working title, a brief description of an investigation plan, but fails to at least half of the other required details.</td>
<td>Topic of the paper is unclear and does not address all required details.</td>
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<tr>
<td><strong>Literature Review</strong></td>
<td>Sufficient background information and a clear review of the topic and why it is important to GIS is evident.</td>
<td>Adequate background information and a clear review of the topic and why it is important to GIS is provided.</td>
<td>The author provides limited background information.</td>
<td>Insufficient or no background information is provided.</td>
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<tr>
<td><strong>Critical Analysis of the Research</strong></td>
<td>Exceptional integration and synthesis of research. Very effectively identifies and discusses implications and common themes relevant to the topic.</td>
<td>Research is integrated and well synthesized. Identifies and discusses some implications and/or themes relevant to the topic.</td>
<td>Very little integration and/or synthesis. Mainly reflects previous research findings, with very little critical analysis of the literature.</td>
<td>Discussion of the research is integrated poorly, with little to no critical analysis of past studies and/or articles.</td>
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<tr>
<td><strong>Future Implications for Field</strong></td>
<td>Effectively applies research findings and discusses implications for the future practice of the GIS field and/or careers related to the topic.</td>
<td>Adequately discusses implications for the future practice of the GIS field and/or careers related to the topic.</td>
<td>Discussion of application to future GIS practice and/or careers is limited.</td>
<td>Does not discuss implications for future practice of the GIS field or careers related to the topic.</td>
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<tr>
<td><strong>References</strong></td>
<td>Author includes at least 20 peer-reviewed articles and correctly cites them according to a consistent citation style of their choosing.</td>
<td>Author includes between 15-19 peer-reviewed articles and cites them according to a consistent citation style of their choosing.</td>
<td>Author includes fewer than 15 peer-reviewed articles and cites them according to their chosen citation style.</td>
<td>The author includes no peer-reviewed articles and does not cite any sufficient outside research.</td>
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<tr>
<td><strong>Grammar and Formatting</strong></td>
<td>No grammatical, spelling, or punctuation errors, and paper follows a consistent format.</td>
<td>Few grammatical, spelling, or punctuation errors, and format is generally consistent.</td>
<td>More than 10 grammatical, spelling, or punctuation errors, and/or formatting is inconsistent.</td>
<td>More than 15 grammatical, spelling, or punctuation errors, and/or inconsistent formatting detracts from paper’s readability.</td>
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<tr>
<td><strong>Length of Research Paper</strong></td>
<td>Length of final paper meets the assigned 4,000-word minimum</td>
<td>Length of final paper falls slightly below 4,000-word minimum</td>
<td>Length of final paper falls sufficiently below the assigned 4,000-word minimum</td>
<td>Length of final paper is unacceptable.</td>
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<tr>
<td><strong>Presentation</strong></td>
<td>Class presentation is around 15 minutes long and clearly presents the main issues of the topic.</td>
<td>Class presentation is around 15 minutes long and fails to cover clearly the issues of the topic.</td>
<td>The presentation goes substantially over or under 15 minutes in length, but covers main issues of the topic</td>
<td>The presentation goes substantially over or under 15 minutes in length and is unclear in covering the main issues of the topic.</td>
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**Total: ____ / 100 points**
Class Attendance Policy:

It is assumed that each student will miss no more than one session and will speak in class -- the equivalent of a "B" grade for "participation." Missing more classes or failing to participate will lower your grade; frequent participation will raise the grade.

Regular attendance is required and necessary. A substantial portion of your grade will be based on in-class work and participation. Unexplained absences will affect your grade. Contact me as soon as possible if you cannot attend class. If you must be absent from class, you must:

- Inform me in advance or as soon as possible after class
- Submit any work due from the missed class period
- Obtain notes, handouts, and so forth from Canvas

Acceptable reasons for absence from class include:

- Illness
- Serious family emergencies,
- Military obligation,
- Severe weather conditions,
- Religious holidays and
- Obligations for court imposed legal obligations (i.e., jury duty, subpoena)

Other reasons may also be approved.

Missing more than one class meeting for reasons other than those listed above will have a negative impact on your course participation grade.

Class Cancellations:

Should it be necessary to cancel a class meeting, every effort will be taken to do so in advance. Look for e-mail announcements via Canvas.

Inclement Weather:

“The University of Tennessee will remain open except in the most severe weather conditions. The Chancellor (or appointed representative) may officially close or suspend selected activities of the university because of extreme weather conditions. When a decision to close is reached, campus and local radio and TV stations will be notified and a UTAlert will be issued. The notice will also be posted on the front page at www.utk.edu...” (Hilltopics) SIS will cancel classes when UT is closed. Please check the SIS student listserv (UTKSIS-L@LISTSERV.UTK.EDU) for messages about closing.

CCI Diversity Statement:

The College of Communication and Information recognizes that a college diverse in its people, curricula, scholarship, research, and creative activities expands opportunities for intellectual inquiry and engagement, helps students develop critical thinking skills, and prepares students for social and civic responsibilities. All members of the College benefit from diversity, and the quality of learning, research, scholarship and creative activities is enhanced by a climate of inclusion, understanding and appreciation of differences and the full range of human experience. As a result, the College is committed to diversity and equal opportunity and it recognizes that it must represent the diversity inherent in American society. The College is acutely aware that diversity and fairness are foundations that unite the College’s faculty, staff, students, and the larger communication and information community.
Title IX Statement:
University of Tennessee faculty are committed to supporting our students and upholding gender equity laws as outlined by Title IX. Please be aware that if you choose to confide in a faculty member regarding an issue of sexual misconduct, dating violence, or stalking, we are obligated to inform the University’s Title IX Coordinator, who can assist you in connecting with all possible resources both on- and off-campus. If you would like to speak with someone confidentially, the Student Counseling Center (865-974-2196) and the Student Health Center (865-974-3135) are both confidential resources.
For additional resources and information, visit titleix.utk.edu (Links).

Academic Integrity:
“An essential feature of the University of Tennessee, Knoxville is a commitment to maintaining an atmosphere of intellectual integrity and academic honesty. As a student of the university, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.”

Plagiarism:
Plagiarism in any of its several forms is intolerable, and attention to matters of documentation in all written work is expected and required. Inadverterence, alleged lack of understanding, or avowed ignorance of the various types of plagiarism are not acceptable excuses.

Specific examples of plagiarism are:
1. Copying without proper documentation (quotation marks and a citation) written or spoken words, phrases, or sentences from any source;
2. Summarizing without proper documentation (usually a citation) ideas from another source (unless such information is recognized as common knowledge);
3. Borrowing facts, statistics, graphs, pictorial representations, or phrases without acknowledging the source (unless such information is recognized as common knowledge);
4. Collaborating on a graded assignment without the instructor’s approval;
5. Submitting work, either in whole or in part, created by a professional service and used without attribution (e.g., paper, speech, bibliography, or photograph).

Infractions of academic integrity are penalized according to the severity of the infraction but may include a course grade of "F." Students who may be unsure of the nature of plagiarism should consult the instructor or a guide for writing research reports.

University Civility Statement:
Civility is genuine respect and regard for others: politeness, consideration, tact, good manners, graciousness, cordiality, affability, amiability and courteousness. Civility enhances academic freedom and integrity, and is a prerequisite to the free exchange of ideas and knowledge in the learning community. Our community consists of students, faculty, staff, alumni, and campus visitors. Community members affect each other’s well-being and have a shared interest in creating and sustaining an environment where all community members and their points of view are valued and respected. Affirming the value of each member of the university community, the campus asks that all its members adhere to the principles of civility and community adopted by the campus: http://civility.utk.edu/.

Disability Services:
“Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services in Dunford Hall, at 865-974-6087, or by video relay at, 865-622-6566, to coordinate reasonable academic accommodations.

Your Role in Improving Teaching and Learning Through Course Assessment:
At UT, it is our collective responsibility to improve the state of teaching and learning. During the semester, you may be requested to assess aspects of this course either during class or at the completion of the class. You are encouraged to respond to these various forms of assessment as a means of continuing to improve the quality of the UT learning experience.
**Course schedule** (subject to change due to unforeseen circumstances)

* All readings should be completed prior to the lecture. Readings will be updated two weeks prior to each lecture.

| Week 1 (Aug. 21) | **Introduction / What is GIS**  
| --- | --- |
| Week 2 (Aug. 28) | **Maps as Numbers & Open Source GIS**  
* Read: 27 Differences Between ArcGIS and QGIS – The Most Epic GIS Software Battle in GIS History [https://gisgeography.com/qgis-arcgis-differences/](https://gisgeography.com/qgis-arcgis-differences/) |
| Week 3 (Sep. 4) | **GIS's Roots in Cartography**  
* Watch: Map Projections explained [https://www.youtube.com/watch?v=wIfLW1j05Dg](https://www.youtube.com/watch?v=wIfLW1j05Dg) |
| Week 4 (Sep. 11) | **Making Maps with GIS**  
* Bishop at USGS CDI FAIR workshop*  
* Read: Articles you found that support and relate to your final project topic  
* Assignments Due: **One-page Final Project Proposal** |
| Week 5 (Sep. 18) | **Getting the Map into the Computer** |
| Week 6 (Sep. 25) | **EXAM 1** |
| Week 7 (Oct. 2) | **Spatial analysis** |
| Week 8 (Oct. 9) | **How to Pick a GIS**  
Bishop out/recorded lecture  
*Go forward; Move ahead; Try to detect it; It’s not too late* |
| Week 9 (Oct. 16) | **GIS use in LIS** |
| Week 10 (Oct. 23) | **Geocoding**  
Bishop out/recorded lecture  
<p>| Week 11 (Oct. 30) | <strong>Geographic Database Management</strong> |</p>
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<thead>
<tr>
<th>Week</th>
<th>Due Date</th>
<th>Section/Notes</th>
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<tbody>
<tr>
<td>Week 13 (Nov. 13)</td>
<td>Ch II. 7 &amp; 8 due</td>
<td><strong>EXAM 2</strong></td>
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<tr>
<td>Week 14 (Nov. 20)</td>
<td></td>
<td><strong>GIS Usability and E-government applications</strong></td>
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<tr>
<td>Week 15 (Dec. 4)</td>
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<td><strong>Due:</strong> Final Presentations</td>
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<tr>
<td>Dec. 10 11:59 PM EST</td>
<td></td>
<td><strong>Due:</strong> <strong>Final Projects</strong> <strong>&lt;sup&gt;</strong>&lt;/sup&gt;</td>
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