INSC 592 Introduction to Data Analytics and Visualization

Spring 2023

School of Information Sciences

Instructor: Peiling Wang, Ph.D. (peilingw at utk.edu)
Classes meet: Tuesday and Thursday 5:05 PM - 6:20 PM at Zoom
Course site: https://utk.instructure.com/ [NetID and password required to access]
Office & hours: 443 Communications Building; Hours in Canvas and by appointment

Catalog Description

Concepts of big data and data analytics in settings such as academia, organizations, the sciences, and on the web. Basic concepts and process of data analytics, and data mining techniques and skills (ETL). Designing effective information visualizations. Prerequisite: INSC 584.

Student Learning Outcomes

Upon satisfactory completion of the course, the student will:

• understand the needs and importance of data analytics in various contexts
• understand the lifecycle and tasks for completing a research project using data
• use SQL for data science
• practice data wrangling (data preparation)
• conduct exploratory analysis and visualization
• conduct text and sentiment analysis
• develop and evaluate models

Programmatic Outcomes/Department Goals:

Your assignments and project can demonstrate one or more of the SIS MS learning outcomes 5 – 9 (https://sis.utk.edu/outcomes)

1 OIT HelpDesk via phone (865) 974-9900 or online at http://help.utk.edu/
Course Design

This course is designed to build knowledge of data science including data management, applied research, statistical methods, and computational skills. Big data and analytics are about real-world applications in various contexts to support decision-making.

Course Materials

*Data Science Foundations with Python*, eText from zyBook

Readings or LinkedIn lessons are posted in Canvas by week. The following e-books are accessible from the UTK library or Open Access:


Openstax (2013, 2021) *Introductory Statistics*

Assignments and Grading

- Data scientists – tasks and skill sets (10 %)
- Data analytics & visualization tools in the flipped classroom (20 %)
- Structured data analysis (20 %)
- Sentiment analysis (20 %)
- Project (30%) (Project may be teamwork)

Assignments are posted in Canvas. I will discuss each in advance.

The University of Tennessee grading system (https://registrar.utk.edu/online-transcript-key/)

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<th>Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>superior (4.0)</td>
<td>A- : intermediate grade (3.7)</td>
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<tr>
<td>B+</td>
<td>very good (3.3)</td>
<td>B: good (3.0)</td>
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<tr>
<td>B-</td>
<td>intermediate grade (2.7)</td>
<td>C+: Fair (2.3)</td>
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<td>C</td>
<td>Satisfactory (2.0)</td>
<td>C-: Unsatisfactory (1.7)</td>
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<td>D+</td>
<td>Unsatisfactory (1.3)</td>
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<td>D-</td>
<td>Unsatisfactory (0.7)</td>
<td>F: Failure (0.0)</td>
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Course Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
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<tr>
<td>A</td>
<td>&gt;= 95 %</td>
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<tr>
<td>A-</td>
<td>&lt; 95% and &gt;= 90%</td>
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<tr>
<td>B+</td>
<td>&lt; 90% and &gt;= 87%</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 87% and &gt;= 84%</td>
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<tr>
<td>B-</td>
<td>&lt; 84% and &gt;= 80%</td>
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<tr>
<td>C+</td>
<td>&lt; 80% and &gt;= 77%</td>
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<tr>
<td>C</td>
<td>&lt; 77% and &gt;= 74%</td>
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<td>D+</td>
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<td>D</td>
<td>&lt; 67% and &gt;= 64%</td>
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<tr>
<td>D-</td>
<td>&lt; 64% and &gt;= 60%</td>
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<tr>
<td>F</td>
<td>&lt; 60% and &gt;= 0%</td>
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Course Feedback

In order to maximize learning outcomes, students are encouraged to provide criticisms and suggestions for the instructor to help students achieve learning goals. You may do so by meeting with me, emailing me, or just dropping an anonymous note.

Being Successful in This Course

- Students will be prepared for all classes such as reading before class; being active in participating in discussions online and in Canvas; meeting due dates on assignments
- The instructor will be attentive to and supportive of individual students’ needs; create and facilitate meaningful learning activities; provide feedback on assignments in a timely manner.

Schedule

see Canvas

Policies and Additional Information

Inclement Weather

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 made, information is distributed to the campus community, shared with local media, and posted on the front page at http://utk.edu. SIS will cancel classes when UT is closed. Please check the SIS student listserv (UTKSIS-L@LISTSERV.UTK.EDU) for messages about closing.

Disabilities that may Impede Learning

Any student who feels s/he may need an accommodation based on the impact of a disability should contact Student Disability Services in 2227 Dunford Hall at 865-974-6087, or by video relay at 865-622-6566 to coordinate reasonable academic accommodations.

Civility

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/.

CCI Diversity Statement

CCI recognizes and values diversity. Exposing students to diverse people, ideas and cultures increases opportunities for intellectual inquiry, encourages critical thinking, and enhances communication and information competence. When all viewpoints are heard, thoughtfully considered, and respectfully responded to, everyone benefits. Diversity and fairness unite us with the wider professional and global community. (Long version at https://cci.utk.edu/diversity)

Instructor Status as a Title IX Mandatory Reporter

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.

Academic Integrity

Students should be familiar and maintain their Academic Integrity described in https://hilltopics.utk.edu/academics/, p. 15 as: “Study, preparation and presentation should involve at all times the student’s own work, unless it has been clearly specified that work is to be a team effort. Academic honesty requires that the student present his or her own work in all academic projects, including tests, papers, homework, and class presentation. When incorporating the work of other scholars and writers into a project, the student must accurately cite the source of that work.”

Students should abide by the Honor Statement (https://hilltopics.utk.edu/student-code-of-conduct/ Section X. Honor Statement)

“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. Inadvertence, alleged lack of understanding, or avowed ignorance of the various types of plagiarism are not acceptable excuses.
Specific examples of plagiarism include:

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

Students who may be unsure of the nature of plagiarism should consult the instructor or a guide for writing research reports. (Additional resources are available at

https://libguides.utk.edu/scholarlypublishing/plagiarism

Infractions of academic integrity are penalized according to the severity of the infraction but may include a course grade of "F."