



THE UNIVERSITY OF
TENNESSEE
KNOXVILLE
BIG ORANGE. BIG IDEAS.

INSC 592 Introduction to Data Analytics and Visualization

Spring 2021

School of Information Sciences
College of Communication and Information

Instructor: Peiling Wang, Ph.D.
Classes: Tu/Th 6:30 - 7:45 pm at Zoom
Specifics: <https://utk.instructure.com/> [NetID and password required to access]
Office: 443 Communications Building; voice mail: (865) 974-3700
Hours: See Canvas course site; also available by appointment
Email: peilingw@utk.edu

Catalog Description

Introduces the concepts of big data and data analytics in academics, businesses, sciences, the Web, etc. To master basic concepts and processes of data analytics. To practice data mining techniques and skills (ETL). To design effective information visualizations.

Student Learning Outcomes

Upon satisfactory completion of the course, the student will:

- To survey the needs and importance of data analytics in various contexts
- To understand the challenges of managing big data
- To practice data extraction, transformation and load techniques (ETL)
- To conduct exploratory analyses
- To ask relevant questions
- To develop algorithms to analyze and model data
- To communicating results to diverse users
- To visualize data and information

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.

Textbooks and Readings

John D. Kelleher and Brendan Tierney (2018). Data Science (MIT Press Essential Knowledge series)

Roger Peng (2016). The Art of Data Science.

Jeffrey Stanton (2013). An Introduction to Data Science. 3rd Edition.

Chetashri Bhadane, Hardi Dalal, & Heenal Doshi (2015). Sentiment Analysis: Measuring Opinions, *Procedia Computer Science*, 45, 808-814, <https://doi.org/10.1016/j.procs.2015.03.159>.

Ronald Rousseau, Leo Egghe, and Raf Guns (2018). *Becoming Metric-Wise: A bibliometric guide for researchers* Preview the document, Chandos-Elsevier at library collection, online access at UTK Library

Additional papers or chapters will be accessible from the Canvas course site with links from the schedule.

Class Attendance & Participation

Prepared attendance and participation in course activities are important to succeed in this course. If you have to miss a class for whatever reason, you are still responsible for the material covered. Class sessions are recorded for replay.

Missing more than one class meeting for reasons other than those listed above will have a negative impact on your course participation grade. *Acceptable reasons for absence from the class include:*

- Illness
- Serious family emergencies
- Special curricular or job requirements (e.g., judging trips, field trips, professional conferences)
- Military obligation
- Severe weather conditions
- Religious holidays
- Participation in official university activities such as music performances, athletic competition or debate
- Obligations for court imposed legal obligations (i.e., jury duty, or a subpoena)

Assignments and Grading

Instructions and due dates for the assignments are posted to and accessible from the Canvas course site. A late assignment will result in a point deduction (1/each day) unless a prior request has been approved with a new due date agreed upon. Acceptable reasons are similar to the above listed.

1. Data scientists – tasks and skill sets (10 %)
2. Data analytics and visualization tools (10 %)
3. Presenting in one of the Flipped classroom (10 %)

4. Data exploratory analysis (20 %)
5. Sentiment analysis (20 %)
6. Citation analysis or metrics applied in a field (20 %) (bibliometrics, biometrics, econometrics, informetrics, scientometrics, webometrics, altmetrics...)
7. *As an alternative to 5 or 6, you may design a data analytics project relevant to your discipline (20 %)*

Discuss with the instructor your proposed project (The project should apply learning in this course to answer research or business questions by collecting real-world data, analyzing data, and visualizing results)

8. Presentation of one assignment (either 4, 5, 6 or 7) (10%)

The University of Tennessee grading system for graduate level courses

A: superior performance	A-: intermediate grade performance
B+: very good performance	B: good performance
B-: intermediate grade performance	C+: less than satisfactory
C: well below the standard expected of graduate students	D or F cannot be used to satisfy degree requirements

Course Communications

Canvas is the course communication space. Discussions, Announcements, Assignments, Schedules, Grades, and any related matters will be facilitated by Canvas. If you send email from Canvas, be sure to include your Vols email because canvas email cannot be replied to directly

Synchronous Zoom classes will have technical support. You may call SIS support at (888) 378-9338 or (865) 974-7913; OIT HelpDesk via phone (865) 974-9900 or online at <http://help.utk.edu/>.

Required Technology

Computer and Internet access to OIT resources.

Course Feedback

In order to maximize learning outcomes, students are encouraged to provide criticisms, input and suggestions to my teaching. 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; be active in participating in discussions online and in Canvas; meet due dates on assignments
- The instructor will be attentive to and supportive of individual student’s 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

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.

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 <http://www.lib.utk.edu/instruction/plagiarism>.)

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

SIS MSIS Program Outcomes

It is our vision to provide a quality educational program, and for students to have the very best educational experience possible. By the end of their time in the MSIS program, each student should be able to:

1. Describe and discuss the processes of creation, organization, distribution, storage, access, retrieval, management, use, and preservation of information.
2. Describe and discuss the nature of leadership and management in the information professions and the importance of participation in the global information society.
3. Apply the general principles, values, and ethical standards of providing information services in a variety of settings and for diverse populations.
4. Comply with the changing responsibilities of the information professional in a culturally diverse and networked global society.
5. Identify critical professional issues in a variety of organizational, cultural, societal, disciplinary, transdisciplinary, and historical contexts.
6. Analyze and apply standards or policies related to the processes of creation, organization, distribution, storage, access, retrieval, management, use or preservation of information.
7. Explain the changing nature of information, information needs, and information behavior.
8. Assess and implement information technologies, systems, sources, and services that serve users effectively and efficiently.
9. Analyze research and apply it to information practice.