INSC 592 Introduction to Data Analytics and Visualization

Spring 2022

School of Information Sciences, College of Communication and Information

Instructor: Peiling Wang, Ph.D. (peilingw at utk.edu)
Classes meet: Tuesday and Thursday 6:30 - 7:45 pm at Zoom
Course site: https://utk.instructure.com/ [NetID and password required to access]
Office hours: See course site and by appointment

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

Programmatic Outcomes/Department Goals:

Your final project can demonstrate one or more of the SIS MS learning outcomes 5, 6, 7, 8, or/and 9 (https://sis.utk.edu/outcomes)
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

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


OpenStax (2013, 2021) *Introductory statistics*


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 competitions or debate
- Obligations for court imposed legal obligations (i.e., jury duty, or a subpoena)

Assignments and Grading

Attending classes (10%)

1. Data scientists – tasks and skill sets (10 %)
2. Data analytics and visualization tools in one of the flipped classroom (10 %)
3. Structured data analysis (20 %)
4. Sentiment analysis (20 %)
5. Citation analysis or metrics applied in a field (20 %) (scientometrics, bibliometric, econometrics, informetric, webometric, altimetric ...)


6. As an alternative to 4 or 5 (not both), you may design a data analytics project relevant to your discipline
   (Discuss with the instructor about 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)

7. Presentation of one assignment (either 3, 4 or 5) (10%)

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.

The University of Tennessee grading system for graduate level courses

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>superior performance</td>
</tr>
<tr>
<td>A-</td>
<td>intermediate grade performance</td>
</tr>
<tr>
<td>B+</td>
<td>very good performance</td>
</tr>
<tr>
<td>B</td>
<td>good performance</td>
</tr>
<tr>
<td>B-</td>
<td>intermediate grade performance</td>
</tr>
<tr>
<td>C+</td>
<td>less than satisfactory</td>
</tr>
<tr>
<td>C</td>
<td>well below the standard expected of graduate students</td>
</tr>
<tr>
<td>D/F</td>
<td>cannot be used to satisfy degree requirements</td>
</tr>
</tbody>
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Course Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&gt; 97%</td>
</tr>
<tr>
<td>A-</td>
<td>&gt; 93% and &lt;=97%</td>
</tr>
<tr>
<td>B+</td>
<td>&gt; 90% and &lt;=93%</td>
</tr>
<tr>
<td>B</td>
<td>&gt; 87% and &lt;=90%</td>
</tr>
<tr>
<td>B-</td>
<td>&gt; 83% and &lt;=87%</td>
</tr>
<tr>
<td>C+</td>
<td>&gt; 80% and &lt;=83%</td>
</tr>
<tr>
<td>C</td>
<td>&gt; 77% and &lt;=80%</td>
</tr>
<tr>
<td>D/F</td>
<td>&lt;= 77%</td>
</tr>
</tbody>
</table>

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](http://utk.edu). SIS will cancel classes when UT is closed. Please check the SIS student listserv ([UTKSIS-L@LISTSERV.UTK.EDU](mailto: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/](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
Infractions of academic integrity are penalized according to the severity of the infraction but may include a course grade of "F."

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