INSC 489 – Data Visualization

COURSE INFORMATION

INSC 489, Spring, 2021, 3 Credit Hours
University of Tennessee, Knoxville
Course Mode: On-campus

Faculty Contact Information
- Jiangen He, Ph.D., Assistant Professor
- He/His/Him
- Email: jiangen@utk.edu
- Personal Website: http://www.jiangenhe.com
- Office hours:
  - Tuesday and Thursday 1:00 pm to 2:30 pm
  - Office: currently unavailable
  - Zoom link: https://tennessee.zoom.us/j/2152859270

SIS Office Information
- 450 Communications Bldg.
- 1345 Circle Park Drive
- Knoxville, TN 37996-0341
- SIS Office: 865.974.2148
- Fax (SIS): 865.974.4667

Catalog Description
Visual, intuitive and interactive representation of information. Fundamental understanding of human perceptual and cognitive capabilities, computer graphics, user interface and creativity. Designs and techniques for visualizing various types of data.

Student Learning Outcomes
Students who complete this course will be able to
• Present information in an intuitive, efficient, effective, and aesthetic manner, for the purposes of explaining ideas and analyzing data.
• Compare methods for visually encoding and interacting with data and understand how these different methods might guide users towards different conclusions.
• Select appropriate visualization methods for the data types of multivariate tables, trees and networks, geospatial, and text data. Understand different ways of formally measuring trade-offs in different visualization approaches.
• Critically and constructively assess the design of existing visualizations.
• Apply data transformations including deriving new data, aggregation, and filtering.
• Gain practical experience and proficiency in creating static and interactive visualizations in Tableau and D3.js.

Course Design
• Course materials will be delivered on Canvas, including reading materials, slides, etc.
• Submit programming assignments on GitHub and other assignments on Canvas. Do not email them to the instructor.
• For technical issues, contact the OIT HelpDesk via phone (865) 974-9900 or online at http://help.utk.edu/

Required Text(s)
All required readings will be provided by the instructor.

Recommended Readings:

COVID-19 Related Information
Students are required to wear face masks at all times and maintain social distancing (6 feet between individuals in traditional classrooms, or, in instructional laboratories and similar settings, only a few minutes in closer proximity when absolutely necessary to achieve learning objectives). Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home.
Instructors have the right to ask those who are not complying with these requirements to leave class in the interest of everyone's health and safety. In the event that a student refuses to comply with these requirements, the instructor has the right to cancel class.
Additionally, following other simple practices will promote good health in and out of the classroom, such as frequent and thorough hand washing, wiping down desks and seats with disinfectant wipes whenever possible, not sharing personal items such as pens and cell phones, and avoiding crowded hallways and other enclosed spaces.
The Volunteer Creed reminds us that we bear the torch in order to give light to others. As Volunteers, we commit to caring for one another and for the members of the communities in which we live, work, and learn. This semester, the University asks that we all demonstrate the Volunteer spirit by following these and other health guidelines and requirements.
COMMUNICATION

Email
I am required to communicate with you through your UTK email address. If you prefer to use another address, consult the OIT Helpdesk (Links to an external site.) to obtain directions for forwarding your UTK email to your preferred address if you do not wish to check both accounts.

Instructor Availability
I am available during weekdays via email. To ensure a quick response, start your message subject line with INSC489. I will reply to your email as soon as I can. I am also happy to speak with you in my office or via zoom during office hours.

COMPUTING REQUIREMENTS AND RESOURCES

Requirements
• You must have adequate computing skills, including but not limited to the use of word processing, Web browsers, e-mail, listservs, and Canvas software.
• You must have a GitHub account and learn how to submit your assignments using Git.
• You must obtain a UT email account. In addition, you must have the PowerPoint Reader or the regular PowerPoint software installed on your computer to download the lecture notes from Canvas.

Technical Support
The Office of Information Technology (OIT) (Links to an external site.) provides training classes in using varied technologies for students at no charge (advance registration is required).

Software
Get your Tableau Desktop and Tableau Prep by these instructions:
1. Download the latest version of Tableau Desktop and Tableau Prep Builder here
2. Click on the link above and select “Download Tableau Desktop” and “Download Tableau Prep Builder”. On the form, enter your school email address for Business E-mail and enter the name of your school for Organization.
3. Activate with your product key: TCES-7E5C-8340-7467-FF33
4. Already have a copy of Tableau Desktop installed? Update your license in the application: Help menu → Manage Product Keys

COURSE ATTENDANCE AND PARTICIPATION POLICIES

Learner Expectations
• Be prepared for all classes
• Be respectful of others
• Actively contribute to the learning activities in class
• Abide by the UT Honor Code
Instructor Expectations
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.

Attendance and Participation
The course schedule below lists which class sessions you should complete at your convenience during each week. It is essential that you keep up by attending the sessions in the proper week so that you can complete assignments and exams as scheduled. Canvas provides statistics about whether or not a student has “attended” a recorded class session, which allows me to “take roll” just as I would in a traditional class.

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, it applies to all classes (whether on-campus or online). The information is distributed to the campus community, shared with local media, and posted on the University homepage at http://utk.edu.

ADDITIONAL POLICIES AND POINTS OF INFORMATION

Disability Services
Any student who feels they 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.

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. For more information, see the UT Principles of Civility and Community.

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](http://titleix.utk.edu).

**ASSIGNMENTS, ASSESSMENTS, AND EVALUATIONS**

**Academic Integrity**

Students should be familiar with the Hilltopics Student Handbook, and comply with all academic policies. This includes the University of Tennessee Honor Statement and the Academic Integrity Policy.

The Honor Statement reads: “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.’” For more information, see the Honor Statement on the Academic Policies and Procedures page of the current catalog for student and faculty responsibilities.

The Academic Integrity policy reads: “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.” For additional information, see the Student Code of Conduct.

**Plagiarism**

Plagiarism in any of its 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 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).

Students who may be unsure of the nature of plagiarism should consult the instructor or a guide for writing research reports. Resources are available through the University Libraries, including a Citing Sources guide.

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

Assignments
This table provides a brief summary of assignment by name, due date, point value, and percentage of final grade. A brief description of each assignment follows the table.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Point Value</th>
<th>Percentage of Final Grade</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>100</td>
<td>10%</td>
<td>Feb 5</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>100</td>
<td>10%</td>
<td>Feb 19</td>
</tr>
<tr>
<td>Assignment 3</td>
<td>100</td>
<td>10%</td>
<td>March 5</td>
</tr>
<tr>
<td>Assignment 4</td>
<td>100</td>
<td>10%</td>
<td>March 19</td>
</tr>
<tr>
<td>Assignment 5</td>
<td>100</td>
<td>10%</td>
<td>April 2</td>
</tr>
<tr>
<td>Assignment 6</td>
<td>100</td>
<td>10%</td>
<td>April 16</td>
</tr>
<tr>
<td>Final Project Presentation</td>
<td>50</td>
<td>5%</td>
<td>April 27 &amp; 29</td>
</tr>
<tr>
<td>Final Project Report</td>
<td>150</td>
<td>15%</td>
<td>May 7</td>
</tr>
<tr>
<td>Mini Labs + Attendance</td>
<td>200</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>1000</td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Preparing Assignments
Specific instructions on how to prepare assignments will be given at the time they are assigned.

Submitting Assignments
Submission instruction will be specified for each assignment. Assignments will be posted on Canvas.

Grading Scale
Semester grades will be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Score Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td>Superior performance (4 quality points)</td>
</tr>
<tr>
<td>A-</td>
<td>90-92.99</td>
<td>Intermediate superior performance (3.7 quality points)</td>
</tr>
<tr>
<td>B+</td>
<td>88-89.99</td>
<td>Very good performance (3.3 quality points)</td>
</tr>
</tbody>
</table>
### Incompletes
Based on adopted University of Tennessee-Knoxville policy, a grade of *I* (Incomplete) is reserved for emergencies that prevent the student from completing the course on time. Incompletes are granted only under "the most unusual of circumstances" and solely at the discretion of the instructor. Plan your semester’s course of study carefully to insure sufficient time to complete the required work. For students who simply "disappear" without contacting the instructor and without completing the required form, an "F" is submitted.

### COURSE EVALUATION
You will be invited by email to evaluate the course at the end of the term via TNVoice. Please participate in this valuable process. I also invite your comments throughout the course and read all comments, suggestions, and recommendations.

### DISCLAIMER
The instructor reserves the right to revise, alter or amend this syllabus as necessary. Students will be notified in writing / email of any such changes.

### COURSE OUTLINE
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jan 21</td>
<td>Introduction to Information Visualization</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Jan 26, 28</td>
<td>Data Abstraction</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Feb 2, 4</td>
<td>Task Abstraction and Interaction</td>
<td>Assignment 1 Due</td>
</tr>
<tr>
<td>4</td>
<td>Feb 9, 11</td>
<td>Visual Representations and Data Transformation</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Feb 16, 18</td>
<td>Color</td>
<td>Assignment 2 Due</td>
</tr>
<tr>
<td>6</td>
<td>Feb 23, 25</td>
<td>Marks + Channels</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Mar 2, 4</td>
<td>Tabular Data</td>
<td>Assignment 3 Due</td>
</tr>
<tr>
<td>8</td>
<td>Mar 9, 11</td>
<td>Map</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Mar 16, 18</td>
<td>Network and Tree</td>
<td>Assignment 4 Due</td>
</tr>
<tr>
<td>10</td>
<td>Mar 23, 25</td>
<td>Text</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Mar 30, Apr 1</td>
<td>Set</td>
<td>Assignment 5 Due</td>
</tr>
<tr>
<td>12</td>
<td>Apr 6, 8</td>
<td>Filter and Aggregation</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Apr 14, 15</td>
<td>Evaluation</td>
<td>Assignment 6 Due</td>
</tr>
<tr>
<td>14</td>
<td>Apr 20, 22</td>
<td>Advanced topics</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Apr 27, 29</td>
<td>Final Project Presentation</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>May 4-7</td>
<td>Final Week</td>
<td>Final Project Report</td>
</tr>
</tbody>
</table>