IST719 Information Visualization

Course: IST719 Info Visualization  Semester: Spring 2017
Instructor: Gary Krudys  E-Mail: gekrudys@syr.edu
Office: 114 Hinds Hall  Phone: 315-857-7243 (cell)
Office hours:
Meeting place: Online only  Meeting time: Online

Pre requisites
Basic experience with R programming

Audience
Graduate online only

Catalog Description
A broad introduction to data visualization for information professionals. Students will develop a portfolio of resources, demonstrations, recipes, and examples of various data visualization techniques.

Course Description
This course will expose students to skills and techniques related to the visualization of large datasets. The skills-based course includes modules on data preparation, knowledge representation, identifying structural relationships within data and visual design principles. Conceptual themes will be presented alongside technical aspects of data visualization. Students will use a suite of visualization tools, including Python, R and Adobe Illustrator, and work with real-world datasets. We will mainly focus on R, particularly the powerful ggplot2 package. Attention will be given to displaying data in response to audience needs.

Credits: 3

Learning Objectives
The learning objectives for this course are adapted from the American Library Association’s Visual Literacy Competency Standards (more information available at: http://www.ala.org/acrl/standards/visualliteracy). Visual literacy enables you to effectively find,
interpret, use, create, and evaluate images and visual media. In the context of this course, you will be interpreting, critiquing and creating visual representations of a range of different types of data sets.

After taking this course, students will be able to:
- Identify and define user needs related to visual representation of large data sets
- Articulate ways images can be used to communicate data and information
- Interpret and analyze the meanings of data visualizations and information graphics
- Describe graphic, and aesthetic elements of visualization (e.g., color, composition, line, shape, contrast, repetition, style)
- Design and create meaningful data visualizations
- Use appropriate editing, presentation, communication, storage, and media tools and applications to prepare and work with data visualizations

Textbooks:
*Visualize This: The FlowingData Guide to Design, Visualization, and Statistics*

*Data Points: Visualization That Means Something*

*ggplot2: Elegant Graphics for Data Analysis*
Note: 2016 edition may be available by beginning of semester, however current course content will focus on 1st edition with references to 2nd edition

*Introduction to Data Science (2013) V3*, by Jeffrey M. Stanton. Available in IST719 Black Board Course Library area

The instructor will provide additional and supplemental readings in Blackboard as electronic documents for downloading and printing. Students are expected to read the assigned materials for discussions and coursework.

Requirements
This class will provide many opportunities to learn about data visualization through hands-on experimentation with tools, design concepts and real-world datasets.

Course material will be delivered as:
- Assigned readings introducing concepts and techniques
- Online group discussions focusing on assigned readings and real world examples of data visualizations
- Skill-based learning modules introducing graphic design principles, features of R programming environment and features of Adobe Illustrator
- Student presentations (Blackboard posts and/or recorded videos)
- Critiques of student work

**Grading**

The work for this class will involve a mixture of individual assignments, reports, and a final project.

**Assignment Percentage of total grade**

- Contributing to class discussion board 20%
- Advanced topic presentation 20%
- Exercises and quizzes 30%
- Final project 30%

**Grading and feedback**

Assignments will be given at least one week prior to when they are due. If you have any questions or concerns about a completing an assignment it is your responsibility to ask questions well before the due date.

Every assignment will include a list of required items and a rubric that will be used to structure the evaluation of your work. Each project will receive a numeric grade and we will provide comments about how you can improve your work in the future.

If you simply meet the requirements for a given assignment, you will probably receive a B. In order to get an A, you will need to go above and beyond the basic requirements. The following are grade expectations and divisions according to the grading policy of the School of Information Studies. An "A" means the student has the capability to independently create engaging information visualization. If a student had a bumpy start at the beginning of the semester but ended up finishing a very high-quality project, his or her project performance will be considered in the final adjustment of the grade. Grades will not be curved in this class.

**Weekly**

**EXERCISES AND ACTIVITIES:** Weekly assignments will involve readings, technical exercises and project-specific activities (such as identifying a real world data set that you would like to work with). You will be asked to make both formal and informal presentations (via recorded videos) throughout the semester. You will also need to complete a series of quizzes posted throughout the semester. These will combine to make up 30% of your final grade.
Ongoing
CLASS DISCUSSION: Every week you are expected to add at least one entry and comment on at least two other posts on the discussion board on Blackboard. Use this as an opportunity to keep track of thoughts, ideas, questions and inspirations. This material will eventually help you to define the topic for your final project. This is worth 20% of your final grade.

ADVANCED TOPIC PRESENTATIONS: There are many other options available for creating visualizations. Examples of other visualization environments include (but are not limited to) C4, D3, Processing, Shiny, GapMinder, SenseUs, Gephi, and iGraph. In order to give you a taste of these other options, each of you will be selecting and presenting an “advanced topic” to the class, highlighting a product or application of your choosing. Your advanced topic presentation will contribute 20% to your final grade.

FINAL PROJECT: The final project is worth 30% of your final grade. You will begin working on your final project since the beginning of the course, with key deliverables being due throughout the semester. These assignments will be graded separately from your final deliverable and will involve:
1. Picking and preparing a dataset
2. Defining an audience and requirements for your visualizations
3. Experimenting with different visual encoding and graphic design choices
4. Conducting user testing
5. Executing your visualization
6. Presenting your final product

Throughout the semester, use your posts, class discussions and exercises to explore topics or questions that you find compelling. Details about requirements for each stage of the final project will be provided at least one week before due dates.

Grading Policy
- Each assigned work will be graded on the scale as specified for the component, which will be summed at the end of the semester.
- Grade levels follow the scales below:
  A = 95-100, A- = 90-94.9, B+ = 85-89.9, B = 80-84.9, B- = 75-79.9, C+ = 70-74.9, C = 65-69.9, C- = 60-64.9, F = below 60
- An incomplete grade, I, can be given only if the circumstances preventing the on-time completion of all course requirements were clearly unforeseeable and uncontrollable. If an incomplete is required a written contract must be completed which specifies the nature of the missing work, the date it will be completed, and the default grade that will be given if that deadline is missed.
- It is unethical to allow some students additional opportunities, such as extra credit assignments, without allowing the same options to all students.
• To discuss a grade, arrange for a private meeting in which you identify the sources of your concern. It is important to bring with you to that meeting the relevant materials (e.g., marked papers). Except for extraordinary circumstances, no appeal for an individual assignment or project will be considered later than two weeks after the graded assignment was returned. For final grades, no appeal will be considered after one week of final project submission date.

Course Specific Policies

Preferred contact methods:
• If you have a question that you don’t mind sharing with the class, post in the “Questions to the Professor” discussion area.
• If you have a more private matter, you can email me at my syr.edu address: gekrudys@syr.edu
• Expect responses within 48 hours, Monday through Friday, primarily before 8:00a EST and after 5:00p EST. Occasionally I will be able to respond during normal business day hours of 8:00a EST – 5:00p EST. My response hours may seem a bit odd primarily because I work full time as a Director of Analytics & Reporting for a Regional Health Information Organization.

Homework Policy
Assignments are due by 11:30pm on the due date. Late assignments will be penalized. **I will deduct 10% of the original grade for the first day of lateness plus 15% for every subsequent day.** Assignments that are late for a week will no longer be accepted and graded.

Your work will also be penalized if you do not follow the file naming convention specified on the assignment sheet. Generally, all assignment should be named as follows: AssignmentName_LastName.extension (usually .PDF)

Academic Integrity Policy

Syracuse University's academic integrity policy reflects the high value that we, as a university community, place on honesty in academic work. The pilot policy in effect at the School of Information Studies defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The pilot policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The pilot policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the pilot policy,
students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered. SU students are required to read an online summary of the university's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information and the pilot policy, see http://academicintegrity.syr.edu.

Disability-Related Accommodations

Syracuse University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), disabilityservices.syr.edu, located at 804 University Avenue, room 309, or call 315.443.4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue “Accommodation Authorization Letters” to students as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. Our goal at the iSchool is to create learning environments that are useable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please meet with me to discuss additional strategies beyond official accommodations that may be helpful to your success.

Religious Observances Notification and Policy

SU’s religious observances policy, found at supolicies.syr.edu/emp_ben/religious_observance.htm, recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students should have an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors no later than the end of the second week of classes through an online notification form in MySlice listed under Student Services/Enrollment/My Religious Observances/Add a Notification.

Student Academic Work Policy

SU policy on student academic work may be found at: http://coursecatalog.syr.edu/content.php?catoid=3&navoid=270#Student_Academic_Work
I intend to use academic work that you complete this semester for educational purposes in this course during this semester. Your registration and continued enrollment constitute your permission.

I intend to use academic work that you complete this semester in subsequent semesters for educational purposes. Before using your work for that purpose, I will either get your written permission or render the work anonymous by removing all your personal identification.

**Tentative Schedule – Topics Areas**

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<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>What is data visualization?</td>
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<td>2</td>
<td>Choosing Tools</td>
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<tr>
<td>3</td>
<td>Asking questions and telling stories Extracting narratives from data Skill building Illustrator Tutorials</td>
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<tr>
<td>4</td>
<td>Aesthetics, persuasion and audience, Graphic Design Principles</td>
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<tr>
<td>5</td>
<td>Introduction to Class Project Brainstorming project ideas</td>
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<tr>
<td>6</td>
<td>Graphic Design Principles (continued)</td>
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<td>7</td>
<td>R ggplot2 Basics</td>
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<td>8</td>
<td>R ggplot2, Data Transformation, Manipulation</td>
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<td>9</td>
<td>R ggplot2 Graphics</td>
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<td>10</td>
<td>R ggplot2, polish graphics</td>
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<td>11</td>
<td>Pitch Day Final project concepts</td>
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<td>12</td>
<td>Advanced Topics Student Presentations</td>
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<tr>
<td>13</td>
<td>Final project Final project wrap-up</td>
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<tr>
<td>14</td>
<td>Virtual Open House Final project presentations</td>
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