Course Description
Titled Information Management, this course is about data analysis and visualization. It aims to help graduate students understand the principles and techniques for extracting useful information and knowledge from data, and hone their data storytelling skills for effective communication. To accomplish these goals, the course includes three topics, fundamentals of quantitative research, data analytics and data visualization. Starting with the fundamentals of empirical research and concluding with visual display of research findings, it provides students with a conceptual understanding of research process as well as practical skills in analytics and visualization necessary to succeed as a research analyst in commercial firms and non-profit organizations.

The course consists of three modules: (i) fundamentals of quantitative research; (ii) data analytics; and (iii) data visualization. The first module reviews some key statistical concepts, components of survey research, and SPSS’ syntax function for data analytics and management. The second module covers more advanced statistical techniques, including TURF analysis, correspondence analysis, regression analysis, factor analysis, and cluster analysis. The goal here is to teach students to view research problems from a data perspective and understand how to systematically analyze such problems and find solutions. Students develop a conceptual understanding and acquire practical knowledge of those procedures, as well as explore their applications in different research scenarios. The third module covers the principles behind data visualization, and introduces guidelines and techniques for designing effective visual displays to communicate research findings and messages. Throughout the semester, class meetings are conducted through a combination of lectures, in-class discussions, and group activities.

Learning Objectives
By the end of the semester, students are expected to have a good command of practical skills needed to succeed as a research analyst and data communication specialist. Specifically, students will be able to: (i) use SPSS syntax for data analysis and management; (ii) adopt appropriate statistical procedures to conduct data analyses depending on research goals and type of survey data; (iii) develop insights from analytical results; and (iv) use computer programs (e.g., Tableau) and online platforms to create data visualization packages for effective communication and storytelling.
**Recommended Preparation:** understanding of basic statistics concepts and applications, as well as use of Excel and SPSS

**Required Textbooks and Reading Assignments**

**NOTE:** Certain chapters from each book will be selected as assigned readings. There is no need to purchase the textbooks; electronic copies are available at USC online libraries.

**Optional Textbooks and Supplementary Materials**
*Data Visualization and Presentation with Microsoft Office*, by Valerie M. Sue and Matthew T. Griffin, SAGE, 2016.

There are reading assignments every week (except for the first and final week). In addition to book chapters from those two books, readings come from peer-review journals on relevant topics, industry sources such as reports and white papers, and online publications. These materials are either posted in Blackboard under "Weekly Materials" or provided to students in class.

Students are expected to complete assigned readings before class and prepare for in-class discussions of the materials. Participation in discussion and response to instructor’s questions are part of the participation score. Assigned readings are not a substitute for the class nor is the class designed to summarize the readings. You will find a lot of materials in lecture that are not there in your readings (and vice-versa).

The following online resources are useful for this class:

1. **Market Research**
   www.quirks.com/articles/index.aspx

2. **SPSS/Statistics**
   https://stats.idre.ucla.edu/spss/
   www.onlinestatbook.com

3. **Data Visualization**
   www.venngage.com/
   www.highcharts.com/
   www.piktochart.com/

**Description and Assessment of Assignments**
Student performance in this class is evaluated based on homework assignments (individual and group), a final project, and class participation, among others.

Individual and group assignments involve designing survey questionnaire, running statistical analysis using SPSS, and creating data visualizations. There is a final project due
at the end of the semester. It requires students to work in groups, analyzing data, identifying the story behind the numbers, and sharing their stories/insights through communicative images and messages. Detailed guidelines will be distributed and explained in class when they come up.

Each group is also expected to do one presentation on data visualization; it is worth 5% of the final grade.

Class participation accounts for 5% of the final grade. It consists of attendance, contributions to class discussions, substantive responses to instructor's questions, interaction with guest speakers, good efforts in group assignments, and meaningful comments on peer's work in the final project presentation.

Grading Breakdown

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Assignment</td>
<td>24%</td>
</tr>
<tr>
<td>Group Assignment</td>
<td>36%</td>
</tr>
<tr>
<td>Final Project</td>
<td>35%</td>
</tr>
<tr>
<td>Participation</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Schedule for Assignments

- Week 2: Individual Assignment 1/Questionnaire re-write
- Week 3: Group Assignment 1/Knowledge discovery
- Week 4: Group Assignment 2/SPSS syntax for data analysis
- Week 7: Individual Assignment 2/Regression analysis
- Week 8: Individual Assignment 3/Cluster analysis
- Week 10: Group Assignment 3/Analytical plan
- Week 11: Group Assignment 4/Data visualization
- Week 12: Group Assignment 5/Data visualization
- Week 12-14: Group Assignment 6/Data visualization presentation

Assignment Submission Policy

You will receive details about each assignment/exam separately. All assignments need to be completed and handed in on time (in instructor's email box by 6:30 pm of the due date) to avoid a grade reduction (10% reduction from the original point). If you are unable to turn in an assignment due to illness or a personal emergency, you must provide written documentation that will allow you to be excused, or discuss your situation with me in a timely manner. Do no wait until the end of the semester to sort things out.

Grading Scale

Each assignment will be worth 100 points and will be converted to a percentage score depending upon the weight assigned to each. Your percentage scores on the assignments will be totaled and translated to a letter grade per the scale shown below:

- A = 100-94
- A- = 94-90
- B+ = 89-87
- B = 86-84
- C = 76-74
- C- = 73-70
- D+ = 69-67
- D = 66-64
B- = 83-80      D- = 63-60
C+ = 79-77      F = 59-0

Grades will be assigned as follows:
A/A-: outstanding, thoughtful and enthusiastic work
B+/B: above average work, demonstrating good insight into assignment
B-/C+: needs improvement on ideas, argument and follow through
C and below: fulfilling the bare minimum and showing little understanding of the material

If you have concerns regarding a grade on a given assignment, you must appeal it in writing, stating the reasons why you feel the grade is inaccurate, within one week of receiving the graded assignment. No late appeals will be accepted for review.

**Grading Timeline**
The instructor will strive to return graded assignments with feedback within a week.

**Additional Policies**
There is no make-up for missed classes; use of smartphone/social media for non-class related issues should be kept to a minimum.

**Note:** The instructor reserves the right to make changes to course contents as well as reading and homework assignments with one week prior notice.
## Schedule of Class Meetings

<table>
<thead>
<tr>
<th>Week 1</th>
<th>August 28</th>
</tr>
</thead>
</table>
| Module I: Fundamentals of Quantitative Research (1) | **Topics**  
Review of course syllabus; statistical concepts (i.e., population and sample; sampling design; normal distribution; hypothesis and null hypothesis; statistical significance; descriptive and inferential stats)  
**Lesson Activity**  
Form groups for group assignments and final project |

<table>
<thead>
<tr>
<th>Week 2</th>
<th>September 4</th>
</tr>
</thead>
</table>
| Module I: Fundamentals of Quantitative Research (2) | **Topics**  
Construct and scales; levels of measurement; reliability and validity; survey questionnaire design issues  
**Readings**  
http://onlinestatbook.com/2/introduction/levels_of_measurement.html  
Other relevant materials are posted in Blackboard.  
**Individual Assignment 1**  
Questionnaire re-write |

<table>
<thead>
<tr>
<th>Week 3</th>
<th>September 11</th>
</tr>
</thead>
</table>
| Module I: Fundamentals of Quantitative Research (3) | **Topics**  
Nature of data; data types and sources; data weighting; knowledge pyramid  
**Readings**  
Relevant materials are posted in Blackboard.  
**Lesson Activity**  
Exploring secondary data sources (www.data.gov; www.bls.gov; www.gss.norc.org) for knowledge discovery  
**Group Assignment 1**  
Knowledge discovery using secondary data  
**Note:** Individual Assignment 1 **DUE** by 6:30 pm |

<table>
<thead>
<tr>
<th>Week 4</th>
<th>September 18</th>
</tr>
</thead>
</table>
| **Topics**  
SPSS syntax for data analysis/ management  
**No Readings** |
| Module I: Fundamentals of Quantitative Research (4) | Group Assignment 2  
SPSS syntax for data analysis  
**Note:** Group Assignment 1 **DUE** by 6:30 pm |
| --- | --- |
| **Week 5**  
**September 25** | **Topics**  
TURF analysis; correspondence analysis/conceptual mapping  
**Readings**  
http://www.statsoft.com/Textbook/Correspondence-Analysis  
Other relevant materials are posted in Blackboard.  
**Lesson Activity**  
Research scenario for TURF analysis  
**Note:** Group Assignment 2 **DUE** by 6:30 pm |
| Module II: Data Analytics (1) | **Week 6**  
**October 2** | **Topics**  
Linear regression; key driver analysis  
**Readings**  
http://www.statsoft.com/Textbook/Multiple-Regression  
Other relevant materials are posted in Blackboard. |
| Module II: Data Analytics (2) | **Week 7**  
**October 9** | **Topics**  
Binary logistic regression; multinomial logistic regression  
**Readings**  
http://www.biostathandbook.com/simplelogistic.html  
Other relevant materials are posted in Blackboard.  
**Individual Assignment 2**  
Regression analysis using SPSS |
| **Week 8**  
**October 16** | Module II: Data Analytics (4) | **Topics**  
Cluster analysis; segmentation; profiling study; factor analysis  
**Readings**  
http://www.statsoft.com/Textbook/Cluster-Analysis  
Other relevant materials are posted in Blackboard.  
**Individual Assignment 3** |
<table>
<thead>
<tr>
<th>Week 9</th>
<th>October 23</th>
<th><strong>Module III: Data Analytics (5)</strong></th>
<th><strong>Topics</strong></th>
<th>Data-based insights; banner plan and crosstabs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>NO READINGS</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Guest Speaker 1:</strong> consumer research and insights</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Lesson Activity</strong></td>
<td>Instructor shares data for initial discussion of final project</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong> Individual Assignment 2 <strong>DUE</strong> by 6:30 pm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 10</th>
<th>October 30</th>
<th><strong>Module III: Data Visualization (1)</strong></th>
<th><strong>Topics</strong></th>
<th>Roles of DV professionals; principles of data visualization; taxonomy of data visualization methods</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Readings</strong></td>
<td>Relevant materials are posted in Blackboard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Group Assignment 3</strong></td>
<td>Final Project analytical plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong> Individual Assignment 3 <strong>DUE</strong> by 6:30 pm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 11</th>
<th>November 6</th>
<th><strong>Module III: Data Visualization (2)</strong></th>
<th><strong>Topics</strong></th>
<th>Principles and techniques of graphic design; form, layout, composition, typography and colors; editorial focus and data preparation in data visualization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Readings</strong></td>
<td>Relevant materials are posted in Blackboard.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Guest Speaker 2:</strong> on graphic design and data visualization</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Group Assignment 4</strong></td>
<td>Data visualization using survey data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Note:</strong> Group Assignment 3 <strong>DUE</strong> by 6:30 pm</td>
<td></td>
</tr>
<tr>
<td>Week 12</td>
<td>Topics</td>
<td>Readings</td>
<td>Lesson Activity</td>
<td>Group Assignment 5</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>----------</td>
<td>-----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>November 13</td>
<td>Module III: Data Visualization (3)</td>
<td>Narrative visualization and data storytelling; data visualization for advocacy; Tableau for data visualization</td>
<td>Relevant materials are posted in Blackboard.</td>
<td>Group presentation on data visualization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group meeting with instructor on final project</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 13</th>
<th>Topics</th>
<th>Readings</th>
<th>Lesson Activity</th>
<th>Group Assignment 5</th>
<th>Note: Group Assignment 5 DUE by 6:30 pm</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 20</td>
<td>Module III: Data Visualization (4)</td>
<td>Role of memory; model of perceptual processing; Tableau for data visualization</td>
<td>Relevant materials are posted in Blackboard.</td>
<td>Group presentation on data visualization</td>
<td>Data visualization</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group meeting with instructor on final project</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 14</th>
<th>Topics</th>
<th>Lesson Activity</th>
<th>Group meeting to finalize final project</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 4</td>
<td>Module III: Data Visualization (5)</td>
<td>Data fluency culture; research ethics; Tableau for data visualization</td>
<td>Group presentation on data visualization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 15</th>
<th>Presentation</th>
<th>Final Project DUE by 11:59 pm on DECEMBER 14 in instructor's email box (<a href="mailto:liuningz@usc.edu">liuningz@usc.edu</a>)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 11</td>
<td>Presentation</td>
<td></td>
</tr>
</tbody>
</table>

8
Statement on Academic Conduct and Support Systems:

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call engemannshc.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call engemannshc.usc.edu/rsvp
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086 equity.usc.edu, titleix.usc.edu
Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421 studentaffairs.usc.edu/bias-assessment-response-support
Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776 dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

**USC Support and Advocacy - (213) 821-4710**
studentaffairs.usc.edu/ssa
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**Diversity at USC - (213) 740-2101**
diversity.usc.edu
Information on events, programs and training, the Provost’s Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

**USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call**
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

**USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call**
dps.usc.edu
Non-emergency assistance or information.