Fall 2015

SRAM898 — Special Topics: Survey Informatics, UNL — Fall 2015 Course Syllabus

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UNL — Fall 2015
Course Syllabus

Instructor

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Lectures

Time: 2:00-4:45 PM, Mondays
Room: 303 Oldfather Hall

Office Hours

Time: 3:00-4:00 PM, Tuesdays and Wednesdays
Room: 930 Oldfather Hall
Alternative: by appointment (please send an email)

Course Prerequisites

None

Text Book

None.

Course Overview

Technology is rapidly changing the way survey researchers collect, manage, and analyze data measuring public opinion.   Cutting-edge methods, tools, and data types offer greater insights into both the survey process, as well as the implications of the substantive responses provided by respondents. In this course, we will explore the role of technology throughout data collection, data management, and data analysis within survey research. We will also explore the increasing need for interdisciplinary teams within research to draw from the strengths of different disciplines (e.g., survey research and methodology, computer science and engineering, cognitive psychology, sociology, statistics, etc.) to properly answer interesting research questions and evaluate hypotheses.

The course content is motivated by real-world applications described in state-of-the-art survey research literature, and topics will be explored using hands on experiences with both synthetic data for assignments, as well as possibly real-world data for final projects (students are strongly

recommended to apply the methods studied in the course to their own research data that may arise from assigned research projects, or used to complete their Masters and PhD degrees).

After successfully completing this course, students will be prepared to perform cutting-edge, data-driven research in survey research, and students will gain skills sought after by companies, government organizations, and academia in the survey research community.

Course Objectives

1. Familiarity with the increasing use of technology in survey data collection, data management, and data analysis
2. Hands-on practice with existing software tools and packages for managing and analyzing data
3. Training working in interdisciplinary teams
4. Exposure to computational thinking
5. Exposure to data analysis and database techniques
6. Exposure to visualization and creative thinking

Lecture Topics Covered

1. Introduction to Survey Informatics: computational thinking, informatics, big data, AAPOR Task Force on Big Data
2. Technology Trends in Survey Research: history of computer use, web surveys and panels, momentary data (e.g., smartphone sensors), intelligent agents (automated interviews), social media
3. Data Types: survey data, paradata, metadata, auxillary data
4. Data Management: wide vs. long flat file formats, relational databases, "big data" databases, Hadoop/MapReduce, ICPSR archiving
5. Data Mining: association rule mining, clustering
6. Machine Learning: supervised learning, classifiers, decision trees, neural networks, graph-based learning algorithms
7. Data Visualization: static and interactive visualizations

Class Participation

Students are expected to attend each class period, read in advance any assigned readings, pay attention during class (e.g., not be distracted by working on laptops, smartphones, tablets, etc.), and actively participate in class discussions. Since this class only meets once per week, each class period is vitally important to learning and understanding the course material so that students can maximize their benefit from taking the course. If students must miss a class period, they are expected to either (1) inform the instructor at least one business day in advance (if expected absence is known in advance, e.g., for conference travel), or (2) provide documentation (e.g., a doctor's note) as soon as possible afterwards, if the absense was unexpected and unavoidable.

Exercises

There will be at least five exercises providing students opportunities for hands-on practice with the course content, such as: (1) practice with R, (2) relational databases, (3) "big data" databases, (4) data mining, and (5) machine learning. Each assignment will require students to work individually (or possibly in teams) to solve a set of problems in a particular area.

Writing Assignments

Students will also engage with course content through two types of writing assignments: (1) individual reflection pieces, and (2) collaborative topic summaries.

First, *each week*, each student will individually write a short (approximately 250 word) reflection piece describing how the student thinks the week's topic(s) may or may not be related to both their field of study, as well as their own individual research. The purpose of these assignments is to provide students opportunities to synthesize the week's topic(s) within the context of their own interests and potential career.

Second, *once within the semester*, each student will participate with other students to provide a collaborative summary of the course topic(s) of that week. As a group, the students assigned to that week's topic(s) will provide a brief summary of the topic(s), as well as both praises for the advantages/strengths and critiques of the disadvantages/weaknesses of the topic(s) covered. The purpose of this assignment is to provide students an opportunity to work in interdisciplinary teams to discuss and understand both the course content and its implications on survey research.

Final Project

Students will be required to work in teams for this Final Project assignment. Each team of students will be required to: (1) choose a project, (2) write a proposal identifying the problem of interest along with a proposed solution (presented to the class around the middle of the semester), (3) develop a solution, (4) report on their analysis and future work, and (5) present their project (during the final two weeks of the semester).

The goal of this project is to provide students with in-depth practice applying Survey Informatics to realistic problems. Students are ***strongly encouraged*** to consider how the course content on Survey Informatics might relate to their Master's, PhD, or assistantship research and choose a project that dovetails with their research activities.

Exams

There will be no exams in this course.

Final Grade

Here is the distribution of points for the course grade: (1) Class participation = 10%, (2) Exercises = 35%, (3) Writing Assignments = 25%, and (3) Final Project = 30%. Final grades are expected to be assigned based on he following scale.

A+:	97% - 100%	B-:	80% - 82%	D+:	67% - 69%
A:	93% - 96%	C+:	77% - 79%	D:	63% - 66%
A-:	90% - 92%	C:	73% - 76%	D-:	60% - 62%
B+:	87% - 89%	C-:	70% - 72%	F:	below 60%
B:	83% - 86%				

Disabilities

Students with disabilities are encouraged to contact Adam Eck for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 132 Canfield Administration, 472-3787 voice or TTY.

Academic Misconduct

Violations of academic integrity will result in automatic failure of the class and referral to the proper university officials. The work a student submits in a class is expected to be the student's own work and must be work completed for that particular class and assignment. Students wishing to build on an old project or work on a similar topic in two classes must discuss this with both professors. Academic dishonesty includes: handling in another's work or part of another's work as your own, turning in one of your old papers for a current class, or turning in the same or similar paper for two different classes. Those who share their assignments and those who copy other's assignments will be penalized in the same way; both parties will be considered to have plagiarized.

For this course, we will adopt the Academic Integrity policy of the Office of Graduate Studies at UNL, found at http://www.unl.edu/gradstudies/current/integrity. You are expected to know and abide by this policy. For additional details on what behaviors are acceptable and unacceptable, you can also consult the Computer Science & Engineering Department's Policy on Academic Integrity, found at http://cse.unl.edu/academic-integrity-policy.

To help avoid these problems, please start assignments early and seek help when you need it.

PLAGIARISM OF ANY KIND IN THIS COURSE WILL RESULT IN A GRADE OF F.