

University of Kentucky
School of Information Science (SIS)

ICT/LIS 661: Introduction to Data Science

Fall 2017 (August 23 to December 8)

Instructor

Youngseek Kim
Assistant Professor
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Email: youngseek.kim@uky.edu and Canvas Messages (Preferred)
Response Time: Within 24 hours during weekdays (expect a delay during weekends and holidays)

Office Hours

Wednesdays: 1:00 p.m. – 5:00 p.m.
and by appointments
Virtual office hours are available during the regular office hours via Adobe Connect

Course Information

Wednesday 6:00 – 9:00 p.m. at 311 Little Library Building

COURSE DESCRIPTION

This course will provide a foundation in the area of data science based on data curation and statistical analysis. The primary goal of this course is for students to learn data analysis concepts and techniques that facilitate making decisions from a rich data set. Students will investigate data concepts, metadata creation and interpretation, general linear method, cluster analysis, and basics of information visualization. At the beginning, this course will introduce fundamentals about data and data standards and methods for organizing, curating, and preserving data for reuse. Then, we will focus on the inferential statistics: drawing conclusions and making decisions from data. This course will help students understand how to use data analysis tools, and especially, provide an opportunity to utilize an open source data analysis tool, *R*, for data manipulation, analysis, and visualization. Finally, in this course we will discuss diverse issues around data including technologies, behaviors, organizations, policies, and society.

COURSE OBJECTIVES

Upon successful completion of this course, students should have developed some or all of the following areas of skills and knowledge:

- An understanding of how the nature of the data collection, the data itself, and the analysis processes relate to the kinds of inferences that can be drawn
- Understand the limitations of data sets based on their contents and provenance
- Knowledge of data organization, management, preservation, and reuse
- Knowledge of what statistical analysis techniques to choose, given particular demands of inference and available data
- Knowledge of general linear models and cluster analysis methods for statistical analysis
- Skills and knowledge in preparing data for analysis, including cleaning data, manipulating data, and dealing with missing data
- Skills in actually analyzing data using open source data analysis tools
- Skills in scripting for data manipulation, analysis, and visualization using *R*, *R-Studio*, and a variety of add on packages.

COURSE MATERIALS

Required Textbook:

Jeffrey M. Stanton (2013). Introduction to Data Science. Available for free in the iTunes bookstore or as a PDF download at <http://surface.syr.edu/istpub/165/>.

Additional readings:

For some weeks, there will be additional readings to the textbook, and they will be made available on the Canvas course site.

COURSE CONDUCT

Canvas as the Learning Platform of the Course

This class uses Canvas as a required part of the course. Teaching materials (syllabus, course notes, discussions, assignments, resources, etc.) will be made available in the Canvas. All assignments should also be submitted to the Canvas. Students can check grading status and progress in the Canvas. Please visit the Canvas Information Pages at <http://www.uky.edu/canvas/> to learn about the Canvas. For technical support, call the UKIT Service Desk at (859) 218-HELP (4357) or email helpdesk@uky.edu.

Communications:

I welcome emails sent to my UKY.EDU email account and/or Canvas Messages account. I prefer to use the Canvas Messages in order to keep all course related emails in one place to facilitate communication; however, please feel free to send me any email message to my UKY.EDU email account. Please do not expect an immediate response on your email message. However, in ordinary circumstances, it is expected that the instructor will respond within 24 hours during weekdays. Please expect a delay during weekends and holidays.

METHODS OF ASSESSMENT

Your final grade is determined by your performance on the items in the table below. Assignments and individual project will be assigned as the course continues. Lastly, we will have a weekly discussion.

Each assignment will be posted at least two weeks before its due date. Please submit your assignments and project through Canvas assignment drop-box. The table below shows the list of assignments, project, and participation and the points for each component.

Type	Topic	Points	Sub Total
Assignments	Assignment #1: Two Topical Presentations (5.0 points × 2)	10.0	45.0
	Assignment #2: Locating Large Datasets	5.0	
	Assignment #3: Developing Research Questions	5.0	
	Assignment #4: Data Science for Library	15.0	
	Assignment #5: Conducting Statistical Analysis with R	10.0	
Project	Final Project: Data Analysis Report	25.0	25.0
Participation	Participation & Discussions (2 points per each week)	30.0	30.0
Total:			100.0

Grade Expectations:

Grades are based on the quality of the submitted work, not upon how well others performed. The following are grade expectations and divisions.

Grade	Score (Percentage)	Expectation
A	90% - 100%	Exceptional Achievement
B	80% - 89%	High Achievement
C	70% - 79%	Average Achievement
E	0% - 69%	Failing

Late assignment policy:

Some of the assignments will be discussed in following week's online discussions after the assignments are due. Most assignments will help build a base for future assignments and the project. Thus all assignments should be turned in on time as specified. An overdue assignment will get a penalty of 20% of total points for each day late. No assignment and project will be accepted after five days except 'excused absences' (see more information in Ethics & Policies below).

RE-GRADING REQUESTS

The grade for each assignment is recorded in the Canvas before the assignment is returned to the student. It is a student's responsibility to ask questions or request re-grading of an assignment within five business days from the time the assignment is returned. No re-grading requests will be accepted after the five business day period.

ETHICS & POLICIES

Students need to notify the professor of absences prior to class when possible. Senate Rules 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, (e) interviews for full-time job opportunities post-graduation and interviews for graduate or professional school, and (f) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Excused Absences and Verification: Please refer to Student Rights and Responsibilities, Part II, Section 5.2.4.2 (<http://www.uky.edu/StudentAffairs/Code/part2.html>) for UK's policy on excused absences. You can request verification for excused absences.

Excused absences include (as defined at the web site above):

- Significant illness of student or serious illness of household member or immediate family
- Death of a household member or immediate family
- Trips for members of student organizations, class excursions or participation in intercollegiate athletic events
- Major religious holidays
- Any other circumstance that the instructor finds reasonable cause for nonattendance

Academic Accommodations: If you have a documented disability that requires academic accommodations, please see me as soon as possible. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, jkarnes@uky.edu) for coordination of campus disability services available to students with disabilities. We can then collaborate on the best solution.

Academic Integrity, Cheating and Plagiarism: You are expected to submit your own original work for all assignments in this course. See the home page for the Office of Academic Ombud Services (<http://www.uky.edu/Ombud>) for a definition of plagiarism, how to avoid plagiarism and UK's new academic offense policy. Please refer to Student Rights and Responsibilities, Part II, Section 6.3

(<http://www.uky.edu/StudentAffairs/Code/part2.html>) for UK's policy on academic integrity.

Classroom Behavior, Decorum and Civility: Please be respectful to others in the class and engage in civil discourse when we discuss topics that have a diversity of perspectives. Please help me maintain the most courteous environment by using a little peer pressure if necessary.

TECHNOLOGY INFORMATION & RESOURCES

Distance Learning Students are expected to have a minimum level of technological acumen and the availability of technological resources. Students must have regular access a computer with a reliable Internet connection and audio capabilities. Internet Explorer 7 (IE) or Firefox 2.x are the recommended browsers for those using a Windows-based PC. Those using Firefox 3.x may encounter problems with assignment uploads. Those using an Apple computer with MAC OS X (10.5.x) may use Firefox 3.x or Safari 3.x.

Please be certain that your computer and/or browser allow you to view Adobe Reader documents (.pdf). Microsoft Office and other software products are free for students: <https://iweb.uky.edu/MSDownload/>.

As your instructor, I am your first go-to person for technology problems. If you need more immediate assistance, please contact UKIT.

Contact information for Distance Learning programs (<http://www.uky.edu/DistanceLearning>) and Information Technology Customer Service Center (<http://www.uky.edu/UKIT/Help/>; 859-218-HELP).

Information Technology Customer Service Center (UKIT)

<http://www.uky.edu/UKIT/>; 859-218-4357

Library Services & Distance Learning Services:

<http://libraries.uky.edu/DLLS>

Carla Cantagallo, Distance Learning Librarian

Phone Number: (859) 218-1240

Email: carla@uky.edu

Interlibrary Loan Service: <http://libraries.uky.edu/ILL>

GENERAL COURSE POLICIES

Policies concerning academic integrity, excused absences and academic accommodations due to disability are available online at:

<http://ci.uky.edu/lis/sites/default/files/policies.pdf>

Military Members and Veterans

We recognize the complexities of being a member of the military community and also a student. If you are a member of the military or a military veteran or dependent, please inform your instructor if you are in need of special accommodations. Drill schedules, calls to active duty, mandatory training exercises, complications with GI Bill disbursement, and other unforeseen military and veteran related developments can complicate your academic life. If you are aware of a complication, we will work with you and put you in contact with university staff members who are trained to assist you. Please contact the Coordinator of the University of Kentucky Veterans Resource Center at (859) 257-1148 for additional assistance. Visit <http://www.uky.edu/veterans> for more available resources.