22:010:690:95 Special Topics in Audit Analytics   **Instructor: Qiao Li**
Spring, 2017 Online   1 Washington Park, Room 919J
Access course material each week   Email: ql106@scarletmail.rutgers.edu
Rutgers Online learning center (http://onlinelearning.rutgers.edu/ecollege)

COURSE DESCRIPTION

This is the second course of Certificate in Audit Analytics, which serves the purpose of further improving students' analytic skills and promoting changes in the profession towards a modern audit. The certificate program is introduced by Rutgers Business School in conjunction with its Master of Accountancy in Financial Accounting (MAccy) Program. This program can fulfill a dual purpose. MAccy students may specialize in the area taking these courses as electives, while non-matriculated students may take the four-course certificate independently.

The course consists two parts: methodology and practice. The first part of the course is intended to develop students' understanding of statistical inference. Students will learn how to apply some basic statistical models to the auditing problems, how to interpret the results, and troubleshoot some common problems. The second part of the course covers some specialized audit analytic techniques such as visualization, neural networks, and text mining.

There is a renewed focus on audit quality in the CPA profession. The PCAOB regulatory regime, the formation of the Center for Audit Quality (CAQ), initiatives at major firms, and other indicators attest to this. The profession is more focused on more effective audit methodologies than it has been for decades. The development of new methodologies needs to be preceded by basic and applied research that establishes a sound theoretical foundation and demonstrates that they will work. The need for such research represents an opportunity for universities to work with audit firms, software vendors and others. The objective of the course is to teach students audit analytic techniques and how to apply them in practice.

COURSE MATERIALS

I don't assign any specific textbook to this course. All the lectures will have a set of slides associated to it and some of them have corresponding videos. You will be able to see the slides and videos gradually at the beginning of each week on e-college.

Teaching materials will be drawn from many sources including the Internet, professional articles, academic articles and books. The WWW is the Universal Library. Part of the learning process of this course is to understand how to mine this resource and combine it with more traditional sources. Make sure that you reference the materials you draw from the Internet, or from other sources.

Check ecollege (http://onlinelearning.rutgers.edu/ecollege) regularly.

LEARNING GOALS AND OBJECTIVES

This course is designed to help students develop skills and knowledge in the following area(s):
1. Audit analytic techniques
2. Applying audit analytic techniques in practice

Students who complete this course will demonstrate the following:
1. Developing the understanding of what statistical inference is and how it is related to audit and data.
2. Mastering some specialized audit analytic techniques such as visualization and neural networks.

COURSE STRUCTURE

The course is practice-oriented featuring presenter demonstrations and student hands-on learning. This course is an online course, so there is no specific class hour for this course. Classes will be organized by weeks. Course materials as well as discussion topics will be posted online at the beginning of each week. You can study the course materials and participate in the discussion at any time during the week. You can access the course materials under your individual student accounts at Rutgers Online Learning center (http://onlinelearning.rutgers.edu/ecollege). A comprehensive instruction about how to use the system will be available after logging in.

NOTE: Most lectures will have a set of slides associated to it. I will post materials on ecollege. However, you must realize that based on how the course progresses I may change those slides somewhat. Furthermore, content evolves rapidly and I may add or subtract content out of the course based on class progress.

PREREQUISITES

There are no prerequisites for this course. Students are assumed to have had basic knowledge of accounting (financial and managerial), auditing and some research methodology. If this is not the case a special supplementary reading list will be prepared with the instructor.

ACADEMIC INTEGRITY

I do NOT *tolerate cheating*. Students are responsible for understanding the RU Academic Integrity Policy (http://academicintegrity.rutgers.edu/files/documents/AI_Policy_2013.pdf). I will strongly enforce this Policy and pursue *all* violations. On all examinations and assignments, students must sign the RU Honor Pledge, which states, "On my honor, I have neither received nor given any unauthorized assistance on this examination or assignment." [I will screen all written assignments through *Safe Assign* or *Turn it in*, plagiarism detection services that compare the work against a large database of past work.]Don't let cheating destroy your hard-earned opportunity to learn. See business.rutgers.edu/ai for more details.

GRADING POLICY
The evaluations of your class participation, the assignments, the course project, and the final exam will be the basis for the course grade. There is no extra credit for this course.

- Class participation   20%
- Assignments   25%
- Course project   25%
- Final exam   30%

Class Participation:

The online chat room in ecollege is the primary source for the students to communicate with instructor and each other. Active participation is encouraged. Each week I will post one question, and you should answer them no later than the end of that week. Students can also participate by posting questions of your own, and answering questions posted by other students. The evaluation of class participation is based on both quantity and quality of the questions and answers.

Assignments:

There will be six individual assignments throughout the semester. The distribution and due dates are listed in the course schedule below. The assignments will require you to do some analytic tasks using the tools and methods covered in class. Each assignment has equal weight in deciding your final assignments grade. You must prepare your answer using a word processor and upload to e-college before the due date. If you upload your answer after the due date and have no valid excuse, you will receive zero score for that assignment. The assignments are important practice for interpreting statistical results of accounting data.

Course Project:

Each student should complete a course project. A course project is a practical application of any techniques(s) learned in this course. It is essential to prepare the project as soon as possible. Every student should prepare a one-page proposal for the project, and submit this proposal for instructor's evaluation by **March 10, 2016**. In this proposal, students need to clarify what is the research question that he/she would like to solve, why the question is interesting or important, what method will be used, and what dataset will be used in the project. Students are required to apply analytical techniques learned in the course to a real-world data set. Finally, the class project should be prepared in the form of a project report as well as PowerPoint slides, and uploaded to e-college by **April 23th, 2016**. Students should also prepare presentations describing their course projects that do not exceed 20 minutes in length, and use "skype" to deliver their presentations in a pre-scheduled time. The presentations will be evaluated based on the content, organization, presentation and originality.

Final Exam

The final exam will be an open-book, open-internet exam and last for three hours. Students should take the final exam though e-college system. All the students are expected to take the final exam at the same time. If a student has a valid excuse not to take the final exam on the exam day which complies with the University regulations, the student must contact me and obtain permission to take the exam on another day. Failure to obtain the necessary permission will result in a zero grade.

Students are expected to learn how to mine and organize the useful resource through Internet. Please do NOT copy/paste from websites! Use your own words and make sure that you cite the materials from the Internet or from other sources appropriately.

PRELIMINARY COURSE SCHEDULE

Lecture	Topic(s)	Presenter(s)	Item(s) due
1 1/17-1/23	• Course introduction • Analytics, big data, and audit automation • Audit ecosystem	Qiao Li Miklos Vasarhelyi	
2 1/24-1/30	Audit Analytics with Statistics (1): • Statistics • Data distribution • Statistics inferences ◆ Assignment 1	Qiao Li Ting Sun	
3 1/31-2/6	Audit Analytics with Statistics (2): • Statistical hypothesis • Null and alternative hypotheses • T tests • Interpreting results ◆ Assignment 2	Qiao Li Jun Dai Pei Li	Assignment 1, due 1/31
4 2/7-2/13	Simple Linear Regression: • Least squares method • R-Square • Demonstration with R ◆ Assignment 3	Qiao Li Pei Li	Assignment 2, due 2/7
5 2/14-2/20	Advanced Audit Analytics (1): • Introduction to data mining • The application of data mining technique - classification: Decision tree • Audit data visualization techniques: Tableau ◆Assignment 4	Qiao Li Abdullah Alawadhi Feiqi Huang	Assignment 3, due 2/14
6 2/21-2/27	Advanced Audit Analytics (2): • Neural network • Association analysis • Fraud detection using machine	Desi Arisandi Qi Liu Yunsen Wang	Assignment 4, due 2/21

	learning ◆ Assignment 5	Qiao Li	
7 2/28-3/6	• Audit Apps • Audit Data Standards ◆ Assignment 6	Jun Dai Pei Li Qiao Li	Assignment 5, due 2/28
8 3/7-3/10	• Government Open Data and Armchair Auditors	Qiao Li Steve Kozlowski	Assignment 6, due 3/7 CLASS PROJECT PROPOSAL, DUE 3/10
9 3/20-3/26	Process Mining: • Applying PM as an analytical procedure in auditing • PM of event logs	Mieke Jans Tiffany Chiu Qiao Li	
10 3/27-4/2	Text Analytics: • Motivation • Definition Application: ROE prediction with numbers and text	Kevin Moffitt Qiao Li	
11 4/3-4/9	Continuous Auditing Advanced Analytics: • Analytics in continuous auditing • Continuity equations	Alex Kogan Qiao Li	
12 4/10-4/16	• Expert systems in auditing • Audit Decision Support System	Deniz Appelbaum Qiao Li	
13 4/17-4/23	• Audit 4.0 • Final Exam Content Review	Jun Dai Qiao Li	CLASS PROJECT, DUE 4/23
14 4/24-4/30	Project Presentation		
15 5/1-5/7	Final Exam		