RUTGERS
Rutgers Business School
Newark and New Brunswick

22:010:688:95: Audit Analytics
Fall, 2016
Rutgers Online Learning Center
(https://onlinelearning.rutgers.edu/ecollege)

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COURSE DESCRIPTION

This is the first course of the Audit Analytics Certificate Program. There are two main purposes of this course: (1) introduce basic application of analytics in both internal and external audit processes in current ubiquitous computer-based information systems, and (2) introduce the application of audit analytics in organizations. The Audit Analytics Certificate Program is also in conjunction with the Master of Accountancy in Financial Accounting (MAccy) Program. MAccy or other graduate students may take this course as an elective, while non-matriculated students may take the four-course certificate independently to update their analytic skills and promote change in the profession towards a modern audit.

Audit analytics has attracted great attention in recent years due to the increase in demand for enhancing audit quality by regulators, creditors, and investors. Audit firms and internal audit teams use audit analytics as part of their engagement. To respond to this demand, this course is designed to familiarize our students with the concept of audit analytics, the basic audit analytical tools, and the application of different analytical methods in the internal and external audit process.

Please note that this course does not primarily focus on the technical aspects of analytical methods. Instead, the emphasis is on the usage of statistics and the interpretation of results rather than the mathematics of specific tools or techniques.

COURSE MATERIALS

There is no specific text book assigned to this course. All of the lectures will have a set of slides associated to them and some of them have corresponding videos. Students will be able to view the posted slides and videos on e-college in the beginning of each week (Monday or Tuesday).
Teaching materials come from various sources, including books, academic articles, professional articles, and the Internet. Note that it is important to gain the ability to conduct your own search of materials. I will reference any material that I draw from other resources, and I hope you to do the same.
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.

LEARNING GOALS AND OBJECTIVES

This course is intended to provide you with the basics of the application of analytics in the (internal and external) audit process in current ubiquitous computer-based information systems and their application in organizations. Students who complete this course are expected to:

1. Gain a managerial overview of analytical techniques.
2. Understand ways in which information systems are used in organizations and industries.
3. Gain understanding of the evolving scenario of big data analytics auditing.

4. Perceive the progressive convergence of analytics methods, information processing, and telecommunication technologies.
5. Link audit analytics to corporate continuous monitoring and business process support.
6. Obtain hands-on experience of using state-of-the-art audit analytical tools.

PREREQUISITES

As the first part of the Audit Analytics Certificate Program, this course has no prerequisite. However, it would be helpful if you have basic knowledge of auditing and statistics.

ACADEMIC INTEGRITY

I do NOT *tolerate cheating.* Students are responsible for understanding the RU Academic Integrity Policy (http://academicintegrity.rutgers.edu). 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 25%
- Assignments 25%
- Course project 25%
- Final exam 25%

Class Participation:

- Online chat room in e-college is the primary way for the students to communicate with instructors and other students.
- Class participation will be evaluated according to students' participation in each week's discussion. Students can participate in the discussion by (1) answering the instructor's questions, (2) posting their own questions, and/or (3) answering other students' questions in the chat room. The instructor will post one to two questions each week, and the students should answer the question once they finish each week's lecture.
- The evaluation of class participation is based on both the quantity and the quality of the questions and answers.

Assignments:

- There will be 3 individual assignments throughout the semester (Please see the distribution dates and due dates of assignments in the course outline below).
- The assignments will require you to do some analytic tasks using the tools covered in class. All homework assignments must be prepared using a word processor.
- Students should upload their assignments to e-college prior to the deadline.

Course Project:

- Students can choose to do the course project individually or in groups. Each group can have up to three students. If you are part of a group in the course project, please explicitly state which part of the project that you contributed to.
- The topic of course project can be of your choice, however, it should be related to the class topics. During the course presentation week, students should prepare a presentation that is between 15 minutes to 20 minutes in length. Each student/group should record your presentations and upload the videos to e-college during the presentation week. Please submit your course project topic to me before the end of eighth week.
- Presentations are evaluated based on the content, organization, originality, and delivery.
- Make sure that you reference the materials that you have retrieved or drawn from the Internet or from other sources.

Final Exam

- The final exam will be a remote exam for three hours: the exam will be sent to students via email, and the students need to send back their exams within three hours.
- The content of the final exam will include the materials covered in the lecture slides, projects and class discussions.
- The students can access to any materials including the Internet during the exam, however, please follow the following two rules during the final exam: (1) the students cannot discuss or share your answers with others during the exam, (2) please properly cite the resources (textbook, link, notes…, etc.) that you use for answering the exam.
- All students are expected to take the final exam at the same time. If a student has valid excuse which complies with University regulations for missing an examination, the student must inform the instructor and obtain permission to miss the examination before the examination. Failure to obtain the necessary permission will result in a zero grade.

COURSE SCHEDULE (Tentative)

Lecture	Outline	Material	Authors
1 09/06-09/11	Introduction ◆ Competing on analytics ◆ Data Analytics in auditing & Continuous auditing (application areas, evolving approaches, and benefits)	Super Crunchers – Ian Aires Competing on Analytics: The New Science of Winning- Thomas H. Davenport and Jeanne G. Harris	Miklos Vasarhelyi He Li
2 09/12-09/18	Software & tools related to audit analytics ◆ Specialized audit software (IDEA/ACL) ◆ Statistical packages (R, WEKA, TABLEAU, etc.) ◆ Audit Data Standards (ADS)		He Li Ting Sun
3 09/19-	Audit Analytics in preliminary analytical procedures (I) ◆ Descriptive statistics (demonstration using	Sample data	Qi Liu

09/25	R) ◆ Additional explanations on the R code		He Li
4 09/26-10/02	Audit Analytics in preliminary analytical procedures (II) ◆ Data Visualization: motivation, demonstration, and interpretation ◆ Assignment 1	Sample data	Qi Liu He Li
5 10/03-10/09	Audit Analytics in preliminary analytical procedures (III) ◆ Basic data analysis (demonstration using ACL&IDEA) • Stratify & Classify • Summarize & Age analysis • Exam sequence & Look for gap ◆ XBRL	Sample data	He Li Eric Cohen
6 10/10-10/16	Audit Analytics in risk assessment (I) ◆ Benford analysis (demonstration using ACL&IDEA) ◆ Duplicate analysis	Sample data	He Li Hussein Issa
7 10/17-10/23	Audit Analytics in risk assessment (II) ◆ Ratio analysis ◆ Assignment 2 ◆ Assignment 1 due		Helen Brown, He Li
8 10/24-10/30	Audit analytics in substantive test ◆ Sampling (demonstration using ACL) • Probabilistic sampling • Monetary unit sampling • Variables sampling ◆ Course project topic due		Qi Liu He Li
9 10/31-11/06	Predictive audit (I) ◆ Regression • Simple linear regression • Audit Risk Model ◆ Belief function		Trevor Stewart Rajendra P. Srivastava
10	Predictive audit (II)		Miklos

11/07-11/13	◆ Expert System • Introduction • How to use expert systems to audit and monitor transaction • Example expansion ◆ Assignment 3 ◆ Assignment 2 due		Vasarhelyi,
11 11/14-11/20	Advanced Audit Analytics Techniques 1 ◆ Clustering • Introduction (concepts and, how to use in audit) • Different clustering techniques (partitional, hierarchical) • Example		He Li
12 11/21-11/27	Advanced Audit Analytics Techniques 2 ◆ Big data • What is big data • How it is evolving today • How it relates to auditing		He Li
13 11/28-12/04	Advanced Audit Analytics Techniques 3 ◆ Text Mining ◆ Process Mining ◆ Final Exam Content Review ◆ Assignment 3 Due		Kevin Moffitt Tiffany Chiu He Li
14 12/05-12/11	Project Presentation		
15 12/12-12/18	Final Exam		

Note: Based on how the course progresses, I may make small changes to the contents of lectures. In addition, because this area is evolving rapidly, it is possible that I will add or subtract some contents.

SUPPORT SERVICES

If you need accommodation for a *disability*, obtain a Letter of Accommodation from the Office of Disability Services. The Office of Disability Services at Rutgers, The State University of New Jersey, provides student-centered and student-inclusive programming in compliance with the Americans with Disabilities Act of 1990, the Americans with Disabilities Act Amendments of 2008, Section 504 of the Rehabilitation Act of 1973, Section 508 of the Rehabilitation Act of 1998, and the New Jersey Law Against Discrimination. https://ods.rutgers.edu

If you are a military *veteran* or are on active military duty, you can obtain support through the Office of Veteran and Military Programs and Services. http://veterans.rutgers.edu/

If you are in need of *mental health* services, please use our readily available services.
[Select for inclusion in syllabus based on course location]
[Rutgers University-Newark Counseling Center: http://counseling.newark.rutgers.edu/]
[Rutgers Counseling and Psychological Services – New Brunswick: http://rhscaps.rutgers.edu/]

If you are in need of *physical health* services, please use our readily available services.
[Select for inclusion in syllabus based on course location]
[Rutgers Health Services – Newark: http://health.newark.rutgers.edu/]
[Rutgers Health Services – New Brunswick: http://health.rutgers.edu/]

If you are in need of *legal* services, please use our readily available services: http://rusls.rutgers.edu/

If you are in need of additional *academic assistance*, please use our readily available services.
[Select for inclusion in syllabus based on course location; undergraduate only]
[Rutgers University-Newark Learning Center: http://www.ncas.rutgers.edu/rlc
Rutgers University-Newark Writing Center: http://www.ncas.rutgers.edu/writingcenter]
[Rutgers University-New Brunswick Learning Center: https://rlc.rutgers.edu/]