COURSE DESCRIPTION

This course is designed for students in the Professional Accounting MBA (PAMBA) program to gain fundamental knowledge about Information Technology (IT) and insights about how emerging technologies are changing businesses and affecting accounting and auditing.

Topics that will be covered in this course are Robotic Process Automation (RPA), Artificial Intelligence (AI), Blockchain and Smart Contract, Big Data & Analytics, Machine Learning, Visualization, Drones, Internet of Things, Information Security, and Continuous Audit. The relationship between these technologies and accounting/auditing will be emphasized.

This course contains lab sessions about using software/programming languages commonly used in practice (e.g. Excel, ACL, Tableau, and Python) to perform data analytics. Approximately, the lab sessions will provide 4 hours for Python and Excel training, respectively, and 2 hours for Tableau and ACL training, respectively.

The format of this course is a combination of lectures given by the instructor or the guest speakers, student presentations, and software lab sessions. This course is aimed to generate students’ interest in emerging technologies, gain necessary skills of performing data analytics using different software, and spark the critical thinking skills so that the students will be prepared for the future of accounting.

COURSE MATERIALS

- There is no textbook for this course. The lecture slides and required readings will be posted on Canvas before class.
- Canvas (canvas.rutgers.edu): Announcements, lecture notes, grades

SOFTWARE REQUIRED

- Python (recommend using Anaconda Jupiter Notebook)
  https://docs.anaconda.com/anaconda/install/
- Microsoft Excel
- Tableau (Free education version https://www.tableau.com/academic/students)

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 SafeAssign or Turnitin, 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.

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**GRADING POLICY**

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<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
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<tbody>
<tr>
<td>30%</td>
<td>Class Participation</td>
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<tr>
<td>15%</td>
<td>Issue Presentations</td>
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<td>15%</td>
<td>Final Project Presentation</td>
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<td>20%</td>
<td>Lab Project</td>
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<td>Final Exam</td>
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**Class Participation**

Class participation is evaluated based on 1) class discussions, 2) clicker question participations, and 3) relevant reading sharing via group emails.

A group email account will be created for this class, and students are encouraged to share related readings via this email address. It is expected that each student should share at least 5 readings for this semester.

**Presentations**

Each group (can be individual or a group of 2 students) will make one issue presentation during the class (maximum 20 minutes) and will have one final project presentation (30 minutes). Group members in the issue presentation and final project presentation can be different. The topics of the issue presentation and the final project presentation can be chosen from the issue topics listed on the syllabus, but the group’s own topics are highly encouraged.

**Lab Project**

A lab project will be assigned in ( ). Students can either work individually or work in groups to complete the lab project. This project will be about data analytics in accounting. 3 different projects will be provided and the students only need to choose one of them and use any software/programming language taught in class to perform the data analytics. A written report (maximum 5 pages with 1.5 spaces) for the project should be submitted by ( ).

**Final Exam**

The final exam is conducted online at home and it will be open-ended essay questions related to topics covered in class.
# COURSE SCHEDULE

<table>
<thead>
<tr>
<th>#</th>
<th>Session 1</th>
<th>Session 2</th>
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| 1 | **Introduction**  
- Course Objective and outline  
- History of IT  
- The state-of-art of IT  
**Issues:**  
- Education in the digital era: what do we need to learn if we can ask Google about almost everything?  
- Digital/Virtual classroom  
- How technology is changing our brains | **Introduction to IT**  
- Impacts of IT on business, accounting, and auditing  
- The Real Time Economy/Electronization  
- Predicting Technology  
**Issue:**  
- Emerging business models (Uber, Stitch Fix, Netflix etc.)  
- Can Uber/Lyft make a profit? |
| 2 | **The Pandemic: measurement and Assurance**  
- Introduction  
- Key data variables  
- A structure for analytics  
- Models that can be applied  
**Issue:**  
1) How good are the numbers we hear on the pandemic?  
2) Can accounting and auditing help?  
**Guest Speakers:**  
() | **The Pandemic: economic consequences and recovery**  
- Introduction  
- Key data variables  
- A structure for analytics  
- Models that can be applied  
- Effects on the profession  
- What is the effect of AI?  
**Issue:**  
1) What is going to be the consequence on employment?  
2) What is going to be the consequence on employment of accountants? |
| 3 | **Robotic Process Automation (RPA)**  
- Introduction  
- RPA in accounting  
- RPA in auditing  
- Implications for accounting education  
- RPA illustration using UiPath  
**Issue:**  
- What should be automated and what should be done by humans?  
- Entry-level jobs are automated. What should we teach in business schools? | **Lab**  
Learn to do RPA using UiPath |
| Session 1 | **Artificial Intelligence**  
- Introduction  
- The singularity  
- The second computer age  
- Effects on employment  
- Machine learning and estimates  
- Expert Systems in auditing | **Issue:**  
- Explainable AI  
- How AI is used in accounting and auditing?  
- Driverless cars and its implications |
| --- | --- |
| 4 | **Session 2**  
- Deep learning (neural networks)  
- Clustering and outlier detection  
- The Ethics of AI | **Guest Speakers:**  
() |
| 5 | **Big Data, Data Analytics, and Machine Learning (1)**  
- Data analytics in business and accounting  
- Data analytics process  
- Data analytics methods overview  
  - Profiling, Data Reduction, Regressions, Classification, Clustering, Visualization, Textual Analysis, Process Mining  
- Audit Data Analytics | **Issue:**  
- Data analytics in business and accounting  
- The obstacles of using data analytics results as audit evidence  
- Are accounting numbers (e.g. profits) still relevant in evaluating firm performance? |
| 6 | **Big Data, Data Analytics, and Machine Learning (2)**  
- Measuring with Exogenous Data (MED), and Government Economic Monitoring (GEM)  
- Dark web  
- Textual analysis and implications on auditing | **Issue:**  
- Is privacy gone? Do we care? How to protect privacy?  
- Surveillance Capitalism Should the tech “big guys” (Facebook, Amazon, Google etc.) be broken down?  
**Guest Speaker:**  
() |
| **Session 1** | **Blockchain, Smart Contracts, Cybercurrencies**  
- Introduction  
- Accounting, auditing, tax, and legal implications | **Issue:**  
- Applications of Blockchain and Smart Contracts in business  
- Can Blockchain be used to solve everything?  
- Stable coins  
- What’s the fate of Bitcoin? |
| **Session 2** | **Lab:**  
Use Python and Excel to do data analytics (1) |
| **Lab:**  
Use Python and Excel to do data analytics (2) |
| **Lab:**  
Use Python and Excel to do data analytics (2) |
<table>
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<tr>
<th>Session</th>
<th>Issue</th>
<th>Guest Speaker</th>
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<tr>
<td>7</td>
<td><strong>Drones</strong>&lt;br&gt;- Drones in accounting and auditing&lt;br&gt;<strong>Internet of Things</strong>&lt;br&gt;- Audit 4.0</td>
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<td><strong>Issue:</strong>&lt;br&gt;- How IoT can be used in accounting and auditing&lt;br&gt;- How drones can be used in accounting and auditing</td>
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<td>8</td>
<td><strong>Issue:</strong>&lt;br&gt;- How are CA and CM adopted today?&lt;br&gt;What are the obstacles and potential solutions?</td>
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<td>9</td>
<td><strong>Issue:</strong>&lt;br&gt;- Cybersecurity&lt;br&gt;- How to provide better assurance to internal control?</td>
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**Session 2**

**Lab:** Use Tableau to do visualization

**Lab:** Use XBRL data to do analytics

**Lab:** Use Galvanize (ACL) to perform audit Procedures

**Lab:** Use Python to build an artificial neural network
SUPPORT SERVICES


[Rutgers University-New Brunswick ODS phone (848)445-6800 or email dsoffice@echo.rutgers.edu]

[Rutgers University-Newark ODS phone (973)353-5375 or email ods@newark.rutgers.edu]

If you are pregnant, the Office of Title IX and ADA Compliance is available to assist with any concerns or potential accommodations related to pregnancy.

[Rutgers University-New Brunswick Title IX Coordinator phone (848)932-8200 or email jackie.moran@rutgers.edu]

[Rutgers University-Newark Office of Title IX and ADA Compliance phone (973)353-1906 or email TitleIX@newark.rutgers.edu]

If you seek religious accommodations, the Office of the Dean of Students is available to verify absences for religious observance, as needed.

[Rutgers University-New Brunswick Dean of Students phone (848)932-2300 or email deanofstudents@echo.rutgers.edu]

[Rutgers University-Newark Dean of Students phone (973)353-5063 or email DeanofStudents@newark.rutgers.edu]

If you have experienced any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, the Office for Violence Prevention and Victim Assistance provides help and support. More information can be found at http://vpva.rutgers.edu/.

[Rutgers University-New Brunswick incident report link: http://studentconduct.rutgers.edu/concern/. You may contact the Office for Violence Prevention and Victim Assistance at (848)932-1181]

[Rutgers University-Newark incident report link: https://cm.maxient.com/reportingform.php?RutgersUniv&layout_id=7 . You may also contact the Office of Title IX and ADA Compliance at (973)353-1906 or email at TitleIX@newark.rutgers.edu. If you wish to speak with a staff member who is confidential and does not have a reporting responsibility, you may
contact the Office for Violence Prevention and Victim Assistance at (973)353-1918 or email run.vpva@rutgers.edu

If students who have experienced a temporary condition or injury that is adversely affecting their ability to fully participate, you should submit a request via https://temporaryconditions.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.
[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.
[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/

Students experiencing difficulty in courses due to English as a second language (ESL) should contact the Program in American Language Studies for supports.
[Rutgers–Newark: PALS@newark.rutgers.edu]
[Rutgers–New Brunswick: eslpals@english.rutgers.edu]

If you are in need of additional academic assistance, please use our readily available services.
[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/]

[Optional items that many faculty include:

- Students must sign, date, and return a statement declaring that they understand the RU Academic Integrity Policy.

- Students must sign, date, and return a statement declaring that they understand this syllabus.]