

**Professional Accounting**  
**Course Number: 22:835:504**  
**Course Title: Information Technology**

## **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.

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## **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>)

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## **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](http://business.rutgers.edu/ai) for more details.

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## GRADING POLICY

30%	Class Participation
15%	Issue Presentations
15%	Final Project Presentation
20%	Lab Project
20%	Final Exam

### 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

#		Topic	Notes
1	Session 1	<b>Introduction</b> <ul style="list-style-type: none"> <li>- Course Objective and outline</li> <li>- History of IT</li> <li>- The state-of-art of IT</li> </ul>	<b>Issues:</b> <ul style="list-style-type: none"> <li>- Education in the digital era: what do we need to learn if we can ask Google about almost everything?</li> <li>- Digital/Virtual classroom</li> <li>- How technology is changing our brains</li> </ul>
	Session 2	<b>Introduction to IT</b> <ul style="list-style-type: none"> <li>- Impacts of IT on business, accounting, and auditing</li> <li>- The Real Time Economy/Electronization</li> <li>- Predicting Technology</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- Emerging business models (Uber, Stitch Fix, Netflix etc.)</li> <li>- Can Uber/Lyft make a profit?</li> </ul>
2	Session 1	<b>The Pandemic: measurement and Assurance</b> <ul style="list-style-type: none"> <li>- Introduction</li> <li>- Key data variables</li> <li>- A structure for analytics</li> <li>- Models that can be applied</li> <li>-</li> </ul>	<b>Issue:</b> <ol style="list-style-type: none"> <li>1)How good are the numbers we hear on the pandemic?</li> <li>2) Can accounting and auditing help?</li> </ol> <b>Guest Speakers:</b> ()
	Session 2	<b>The Pandemic: economic consequences and recovery</b> <ul style="list-style-type: none"> <li>- Introduction</li> <li>- Key data variables</li> <li>- A structure for analytics</li> <li>- Models that can be applied</li> <li>- Effects on the profession</li> <li>- What is the effect of AI?</li> <li>-</li> </ul>	<b>Issue:</b> <ol style="list-style-type: none"> <li>1)What is going to be the consequence on employment?</li> <li>2) What is going to be the consequence on employment of accountants?</li> </ol>
3	Session 1	<b>Robotic Process Automation (RPA)</b> <ul style="list-style-type: none"> <li>- Introduction</li> <li>- RPA in accounting</li> <li>- RPA in auditing</li> <li>- Implications for accounting education</li> <li>- RPA illustration using UiPath</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- What should be automated and what should be done by humans?</li> <li>- Entry-level jobs are automated. What should we teach in business schools?</li> </ul>
	Session 2	<b>Lab</b> <b>Learn to do RPA using UiPath</b>	

4	Session 1	<b>Artificial Intelligence</b> <ul style="list-style-type: none"> <li>- Introduction</li> <li>- The singularity</li> <li>- The second computer age</li> <li>- Effects on employment</li> <li>- Machine learning and estimates</li> <li>- Expert Systems in auditing</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- Explainable AI</li> <li>- How AI is used in accounting and auditing?</li> <li>- Driverless cars and its implications</li> </ul>
	Session 2	<ul style="list-style-type: none"> <li>- Deep learning (neural networks)</li> <li>- Clustering and outlier detection</li> <li>- The Ethics of AI</li> </ul> <b>Lab:</b> Use Python and Excel to do data analytics (1)	<b>Guest Speakers:</b> ()
5	Session 1	<b>Big Data, Data Analytics, and Machine Learning (1)</b> <ul style="list-style-type: none"> <li>- Data analytics in business and accounting</li> <li>- Data analytics process</li> <li>- Data analytics methods overview <ul style="list-style-type: none"> <li>o Profiling, Data Reduction, Regressions, Classification, Clustering, Visualization, Textual Analysis, Process Mining</li> </ul> </li> <li>- Audit Data Analytics</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- Data analytics in business and accounting</li> <li>- The obstacles of using data analytics results as audit evidence</li> <li>- Are accounting numbers (e.g. profits) still relevant in evaluating firm performance?</li> </ul>
	Session 2	<b>Lab:</b> Use Python and Excel to do data analytics (2)	
6	Session 1	<b>Big Data, Data Analytics, and Machine Learning (2)</b> <ul style="list-style-type: none"> <li>- Measuring with Exogenous Data (MED), and Government Economic Monitoring (GEM)</li> <li>- Dark web</li> <li>- Textual analysis and implications on auditing</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- Is privacy gone? Do we care? How to protect privacy?</li> <li>- Surveillance Capitalism Should the tech “big guys” (Facebook, Amazon, Google etc.) be broken down?</li> </ul> <b>Guest Speaker:</b> ()
	Session 2	<b>Blockchain, Smart Contracts, Cybercurrencies</b> <ul style="list-style-type: none"> <li>- Introduction</li> <li>- Accounting, auditing, tax, and legal implications</li> </ul>	<b>Issue:</b> <ul style="list-style-type: none"> <li>- Applications of Blockchain and Smart Contracts in business</li> <li>- Can Blockchain be used to solve everything?</li> <li>- Stable coins</li> <li>- What’s the fate of Bitcoin?</li> </ul>

			<b>Guest Speakers:</b> ()
7	Session 1	<b>Drones</b> - Drones in accounting and auditing <b>Internet of Things</b> - Audit 4.0	<b>Issue:</b> - How IoT can be used in accounting and auditing - How drones can be used in accounting and auditing  <b>Guest Speaker:</b> ()
	Session 2	<b>Lab:</b> Use Tableau to do visualization	<b>Guest Speaker:</b> ()
8	Session 1	Continuous Auditing (CA) Continuous Monitoring (CM)	<b>Issue:</b> - How are CA and CM adopted today? What are the obstacles and potential solutions?  <b>Guest Speaker:</b> ()
	Session 2	Audit Data Standards XBRL, Inline XBRL  <b>Lab:</b> Use XBRL data to do analytics	<b>Issue:</b> - Why do we need Inline XBRL?  <b>Guest Speaker:</b> ()
9	Session 1	<b>Information Security</b> - Cryptography - Attacks - Internet security - Cloud Security Access control	<b>Issue:</b> - Cybersecurity - How to provide better assurance to internal control? - <b>Guest Speaker:</b> ()
	Session 2	<b>Lab:</b> - Use Galvanize (ACL) to perform audit Procedures - Use Python to build an artificial neural network	<b>Guest Speaker:</b> ()
10	Final Projects Presentation		
11	Final Exam Online Lab Projects due at		

## 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. More information can be found at [ods.rutgers.edu](http://ods.rutgers.edu).

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

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

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

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

[Rutgers–New Brunswick: [eslpals@english.rutgers.edu](mailto: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.]