Rotman Commerce
UNIVERSITY OF TORONTO

Course Outline

RSM 456 H1 S
Big Data and Marketing Analytics
Winter 2019

Course Meets:	LEC0101: Monday	09:00 - 11:00	LA 211
	LEC0201: Wednesday	13:00 - 15:00	VC 115

Instructor:	Gerhard Trippen, RT 413
E-Mail:	Gerhard.Trippen@Rotman.Utoronto.Ca
	Please start subject with **RSM456**
Office Hours:	Mondays, 2:00pm-3:00pm in RT 413, and by appointment
Webpage:	https://q.utoronto.ca/courses/78579 (Quercus for RSM456)
	Make sure you **always read the online Announcements**!
Teaching Assistants:	Naga Paidimarri raja.paidimarri@mail.utoronto.ca
	Sundeep Pothula sundeep.pothula@mail.utoronto.ca
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Course Scope and Mission
The course is designed to introduce students to tools used in marketing analytics. Companies have been collecting vast databases to aid them in making sound marketing decisions. Examples include retail scanner panel data which keeps track of customers' purchase histories, loyalty-program data monitoring purchasing under different promotional environments, social network and online shopping history data. The course uses several marketing data sources to illustrate how to use statistical marketing models to evaluate the impacts of marketing-mix, and manage customer lifetime value.
The objectives of this course are:

- to develop your decision-making skills and deepen your logical analysis skills.
- to expose you to the main concepts of Big Data and Marketing analytics, including:
- to learn how to define the problem and propose a research study with investigation and characterization in order to better understand the goal.
- to manipulate and prepare data.
- to analyze data using descriptive statistics and visualization to better understand the data.
- to learn about and apply machine learning algorithms, to evaluate them and to select the ones to investigate further to improve the results.
- to make predictions and present results and thereby improve presentation skills.
- to gain knowledge about the tools to create accurate models and work projects end-to-end.
- to acquire related programming skills.

Course Prerequisites
Prerequisite: ECO220Y1/ECO227Y1/(STA220H1,STA255H1)/(STA257H1,STA261H1)
Exclusion: RSM411H1

Recommend Readings
Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython by Wes McKinney (pub. yr. 2017).
Python Data Analytics by Fabio Nelli (pub. yr. 2015). Available online through the library website.

Evaluation and Grades
Grades are a measure of the performance of a student in individual courses. Each student shall be judged on the basis of how well he or she has command of the course materials.

Work			Due Date
Lab	Individual Data Analytics Exercises	9%	On-going
Assignment	BDAP: Research Proposal (incl. meeting)	10%	2019-01-25
Assignment	BDAP: Data Manipulation & Descriptive Statistics	10%	2019-03-01
Assignment	BDAP: Data Visualization	10%	2019-03-15
Assignment	BDAP: Machine Learning	10%	2019-03-29
Presentations	BDAP: Group Presentation	8%	Last class
Peer Evals	BDAP: Presentation Peer Evaluations	3%	Last class
Assignment	BDAP: Final Report	8%	Last day of classes
Final Exam	Final Exam	32%	During Faculty of Arts & Science Final Examination period

COURSE FORMAT AND EXPECTATIONS

To Use Turnitin.com:
Normally students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com website.
Your project submissions on Quercus will be automatically submitted to Turnitin.com

For Written Assignments:
Please note that clear, concise, and correct writing will be considered in the evaluation of all group assignments (Big Data Analytics Project milestones). That is, you may lose points for writing that impedes communication: poor organization, weak paragraph development, excessive wordiness, hard-to-follow sentence structure, spelling mistakes and grammatical errors. Students who require additional support and/or tutoring with respect to their writing skills are encouraged to visit the Academic Success Centre (http://www.studentlife.utoronto.ca/asc) or one of the College Writing Centres (www.writing.utoronto.ca/writing-centres). These centres are teaching facilities – not editing services, where trained staff can assist students in developing their academic writing skills. There is no charge for the instruction and support.

For Group Work:
The Big Data Analytics Project (BDAP) requires students to work in teams of 5-6 students (self-selected), i.e., they will work together to conduct an analysis of a Marketing case they propose, conduct analyses to be submitted in form of multiple milestones (as given under " Evaluation and Grades"), present their analyses in class and prepare a final report. The format and criteria for

the milestones, presentation and final report will be distributed in class. All milestones will be submitted online through Quercus at the above specified due dates no later than 11:59pm.

Each group member must be actively involved in the presentation. The class will act as the jury/board of directors and question the groups on their analysis and conclusions. Groups will be evaluated based on their preparation, the quality of their analysis, their ability to provide insight and on their responses to questions.

All students (except for the presenting students themselves) will also be required to complete an online assessments on the assigned groups' presentation, which will be due on the day of the presentations before 11:59pm. These evaluations provide substantial feedback for the presenting group, and will help determine their presentation grade. I reserve the right to overrule these peer assessment recommendations if they are unreasonable or baseless.

Within each group, all members will usually receive the same project grade. In cases where it is clear that an individual has made little or no contribution to the group work, the instructor reserves the right to adjust that individual's mark on the group part of the project grade to a mark less than that given to the group as a whole. For example, in the situation in which no contribution has been made, a mark of zero will be given. This will help recognize individual contributions and to promote equal participation by group members.

If required, group members will evaluate each other for their contributions. I will determine a preliminary group mark for the teams' performance. This group mark may then be modified for each individual group member based on the results of a confidential peer evaluation if necessary. Students will receive an individual mark (not a group mark) which may, or may not, be the same as the group mark that is originally determined or the mark given to other group members. I reserve the right to investigate and adjust any peer evaluations or individual marks. All submissions must be original work, giving credit to others' work where appropriate. Students agree to keep their own project submissions for personal use, not to be widely distributed to other students for future use. Students who violate these rules may be subject to disciplinary action under the University of Toronto Code of Behaviour on Academic Matters.

Learning to work together in teams is an important aspect of your education and preparation for your future careers. That said, project-based teamwork is often new to students; to work well in teams, it helps to follow a set of core expectations to best succeed at your team projects.

1. Read the document entitled, "Working in Teams: Guidelines for Rotman Commerce Students" which is available on the RC portal under the Academic Services tab.

2. When working in a team, Rotman Commerce students are expected to:

- Treat other members with courtesy and respect;
- Honour the ground rules established by the team;
- Contribute substantially and proportionally to the final project;
- Ensure enough familiarity with the entire contents of the group project/assignment so as to be able to sign off on it as original work;
- Meet the project timeline as established by the team.

3. Resolving conflicts:
Conflicts are part of the team's process of learning how to work together. When handled well, it can generate creativity and bring-multiple perspectives to the solution.

Student teams are expected to work through their misunderstandings as soon as they arise (and prior to submission of the final project). When teams are unable to arrive at a solution that works for all members, the team must meet with the Rotman Commerce Team Coach** as soon as possible. The Coach will listen to the team and help develop options for improving the team process. All members of the project team must commit to, and, utilize their action plans.

**For an appointment with a Rotman Commerce Team Coach, please contact Nouman Ashraf at nouman.ashraf@rotman.utoronto.ca Nouman is highly skilled at facilitating team dynamics and collaboration. Note that the Team Coach's s role is to provide guidance, support and advice on team matters – not to formally evaluate or assess teamwork for academic purposes.

Electronic Course Materials

This course will be using the following electronic course materials:

1. Materials on Quercus
2. DataCamp (https://www.datacamp.com) will be provided at **NO** additional **COST** to you.
3. I strongly recommend you install the full Python ANACONDA distribution on your laptop, which you need to bring to class to work on coding exercises.
   https://www.anaconda.com/download/
   The ANACONDA distribution is open source.
   Alternatively, you can also use Colaboratory – Google: https://colab.research.google.com
   (It is free, but you need a Google account.)

Weekly Schedule

Session	Date	Topic
1	2019-01-07 2019-01-09	Introduction Initial Big Data Example outlining the ideas that we will discuss throughout the term
2	2019-01-14 2019-01-16	Short Introduction to Python Basics
3	2019-01-21 2019-01-23	Data Structures for Big Data
4	2019-01-28 2019-01-30	Data Manipulation - Part I
5	2019-02-04 2019-02-06	Data Manipulation - Part II
6	2019-02-11 2019-02-13	Descriptive Statistics
7	2019-02-25 2019-02-27	Data Visualization - Part I
8	2019-03-04 2019-03-06	Data Visualization - Part II

9	2019-03-11 2019-03-13	Machine Learning - Supervised Learning: Classification
10	2019-03-18 2019-03-20	Machine Learning - Supervised Learning: Regression
11	2019-03-25 2019-03-27	Machine Learning - Unsupervised Learning
12	2019-04-01 2019-04-03	Big Data Analytics Project Presentations
Final Exam	TBA by FAS	

POLICY AND PROCEDURE

Missed Tests and Assignments (including midterm examinations)
Students who miss a test or assignment for reasons entirely beyond their control (e.g. illness) may submit a request for special consideration. The Request for Special Consideration Form and supporting documentation must be submitted in a timely manner in order for the request to be reviewed.

In such cases, students must notify the Rotman Commerce Program Office on the date of the course deliverable such as a missed test, or assignment missed class (in the case of participation marks), or due date. They must then complete a Request for Special Consideration Form and submit it along with supporting documentation (e.g. Verification of Student Illness or Injury form) to the Rotman Commerce Office within **2 business days** of the originally scheduled course deliverable. Students who do not provide appropriate or sufficient supporting documentation will be given a grade of 0 (zero) for the missed course deliverable.

Documentation submitted in support of petitions for missing tests and assignments must be original; no faxed or scanned copies will be accepted.

Note that the physician's report must establish that the patient was examined and diagnosed at the time of illness, not after the fact. Rotman Commerce will not accept a statement that merely confirms a later report of illness made by the student to a physician.

Late Assignments
Please note that all assignments are due by the specified deadlines. The exact date and time will be given in the Quercus assignment. No late assignments will be accepted, except for students who, for reasons beyond their control, are unable to submit an assignment by its deadline must obtain approval from the instructor for an extension. Supporting documentation will be required as per the policy on missed tests and assignments.

Accessibility Needs
The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course

materials, please contact Accessibility Services as soon as possible: accessibility.services@utoronto.ca or http://www.studentlife.utoronto.ca/as.

Academic Integrity
Academic Integrity is a fundamental value essential to the pursuit of learning and scholarships at the University of Toronto. Participating honestly, respectively, responsibly, and fairly in this academic community ensures that the UofT degree that you earn will continue to be valued and respected as a true signifier of a student's individual work and academic achievement. As a result, the University treats cases of academic misconduct very seriously.

The University of Toronto's Code of Behaviour on Academic Matters http://www.governingcouncil.utoronto.ca/policies/behaveac.htm outlines the behaviours that constitute academic misconduct, the process for addressing academic offences, and the penalties that may be imposed. You are expected to be familiar with the contents of this document. Potential offences include, but are not limited to:

In papers and assignments:
- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment (this includes collaborating with others on assignments that are supposed to be completed individually).

On test and exams:
- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers
- Misrepresenting your identity.
- Submitting an altered test for re-grading.

Misrepresentation:
- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to), medical notes.

All suspected cases of academic dishonesty will be investigated by the following procedures outlined in the *Code of Behaviour on Academic Matters.* If you have any question about what is or is not permitted in the course, please do not hesitate to contact the course instructor. If you have any questions about appropriate research and citation methods, you are expected to seek out additional information from the instructor or other UofT resources such as College Writing Centres or the Academic Success Centre.

Email
At times, the course instructor may decide to communicate important course information by email. As such, all UofT students are required to have a valid UTmail+ email address. You are responsible for ensuring that your UTmail+ email address is set up AND properly entered on the ROSI system. For more information please visit http://help.ic.utoronto.ca/category/3/utmail.html

Forwarding your utoronto.ca email to a Hotmail, Gmail, Yahoo or other type of email account is not advisable. In some cases, messages from utoronto.ca addresses sent to Hotmail, Gmail or Yahoo accounts are filtered as junk mail, which means that important messages from your course instructor may end up in your spam or junk mail folder.

Quercus and the Course Page
The online course page for this course is accessed through Quercus. To access the course page, go to https://q.utoronto.ca/courses/78579 and log in using your UTORid and password. Once you have logged in, you will be at the Quercus Dashboard. On this page you will see all of the courses you are presently enrolled in. If you don't see the course listed here but you are properly registered for the course in ROSI, wait 48 hours.

Recording Lectures
Lectures and course materials prepared by the instructor are considered by the University to be an instructor's intellectual property covered by the Canadian Copyright Act. Students wishing to record a lecture or other course material in any way are required to ask the instructor's explicit permission, and may not do so unless permission is granted (note: students who have been previously granted permission to record lectures as an accommodation for a disability are, of course, excepted). This includes tape recording, filming, photographing PowerPoint slides, Quercus materials, etc.

If permission is granted by the instructor (or via Accessibility Services), it is intended for the individual student's own study purposes and does not include permission to "publish" them in anyway. It is absolutely forbidden for a student to publish an instructor's notes to a website or sell them in any other form without formal permission.