

Course Outline

Course Code	RSM 456 H1 S
Course Name	Big Data and Marketing Analytics
Term, Year	Winter 2024
Course Meets	Wednesday – 3-5 PM (L0201), 5-7 PM (L0101), Location: WO
Web page URL	https://q.utoronto.ca

Instructor Details

Name	Email	Phone	Office Hours	Virtual Office Link
Sridhar Moorthy	sridhar.moorthy@rotman.utoronto.ca	416-978-6312	Tuesdays, 3-5 PM	Click here to attend office hours

Course Scope, Mission and Learning Outcomes

Over the last twenty years, technological advances have enabled organizations to collect a variety of data about consumers in large quantities (“Big Data”). Information comes in many forms: aggregate data from retail check-out scanners, individual-level transaction data based on loyalty cards, online data on browsing, conversions, social media interactions, search queries, surveys, web logs, etc. This course will provide you with the tools and conceptual frameworks necessary to leverage such data to make marketing decisions.

The specific learning outcomes we seek are:

- Understand the difference between product-centric marketing and customer-centric marketing.
- Understand the concepts of customer profitability and lifetime value (CLV), and how to allocate marketing resources targeted to different components of CLV
- Market segmentation, including machine-learning techniques for doing so
- Exposure to case studies that demonstrate the value of customer analytics in real-world decision-making contexts .
- Learn to code marketing models and machine-learning algorithms using the open-source software platform R.

Course Prerequisites

Prerequisite: ECO220Y1/ECO227Y1/(STA220H1, STA255H1)/(STA237H1, STA238H1)/(STA257H1, STA261H1)

Exclusion: RSM411H1 (Special Topics in Management: Marketing Data, Models and Decisions)

Course Materials

Required Readings

- Most of the readings come from the book, *Marketing Analytics*, by Rajkumar Venkatesan, Paul W. Farris, and Ronald T. Wilcox (VFW, hereafter). U of T Library links to individual chapters are provided on Quercus.
- One reading comes from the book, *Database Marketing*, by Robert C. Blattberg, Byung-Do Kim, and Scott A. Neslin (BKN, hereafter). U of T Library link to the reading is provided on Quercus.
- In addition, there is one case from Harvard Business Publishing entitled “Pilgrim Bank (A)” (costing \$10.30) and another from Kenan-Flagler Business School (UNC-Chapel Hill) entitled “Assessing RFM at Tuscan Lifestyles.”

Electronic Course Materials

This course will use the following electronic course materials:

- Quercus (where I will post slides, articles, video, cases, announcements, etc.)
- Datacamp (<https://www.datacamp.com>): access to select DataCamp courses will be provided at **NO** additional **COST** to you.
- Software: R and R Studio (front-end for R). Both R and R Studio are open-source.
 - Install R for Windows from [here](https://cran.r-project.org/bin/windows/base/) (<https://cran.r-project.org/bin/windows/base/>) and R for macOS from [here](https://cran.r-project.org/bin/macosx/) (<https://cran.r-project.org/bin/macosx/>)
 - Install R Studio from [here](https://posit.co/download/rstudio-desktop/) (<https://posit.co/download/rstudio-desktop/>).
 - Bring your laptop to class to work on coding exercises.
- Suggested readings for R:
 - [R for Data Science](#). Wickham and Grolemund (2nd edition, 2023; open-source)
 - [R for Marketing Research and Analytics](#). Chapman and Feit (2nd edition, 2019; available from U of T Library as an electronic resource)

These materials will cost a total of **\$10.30**. The use of these materials complies with all University of Toronto policies which govern fees for course materials.

Evaluation and Grades

Grades are a measure of the knowledge and skills developed by a student within individual courses. Each student will receive a grade on the basis of how well they have command of the course materials, skills and learning objectives of the course.

Work	Percentage of grade	Due Date (12 PM)
6 datacamp courses (individual)	30	Jan 10, Jan 17, Jan 31, Feb 28
Quiz 1 (individual)	15	Feb 14
Quiz 2 (individual--cumulative)	25	Apr 3
Team Assignment 1	9	Jan 31
Team Assignment 2	9	Mar 6
Team Assignment 3	9	Mar 20
Research requirement (BRL) (individual)	3	Mar 31

Course Format and Expectations

Datacamp courses

A key component of the course is the Datacamp courses you will do outside of class, complementing your in-class work. These DataCamp courses are meant to achieve three objectives: (i) review materials that are Prerequisites for the course, (ii) develop proficiency in coding data analytic procedures in R, (iii) reinforce learning of the new analytical techniques discussed in class. The due dates for completing these courses are in the Class Schedule below; they have been chosen carefully to synchronize with the topics being discussed in class. You are encouraged to get an early start on these courses—since they don't rely on class material, you can start them whenever you like—so that you don't have rush just before the due date.

Each Datacamp course typically has four chapters. Generally you will be expected to finish all four chapters before a single due date (for example, "Introduction to R" by January 10). Occasionally, however, you will do a Datacamp course in two stages: some chapters before a certain date (for example, Chapters 1-3 of "Introduction to Regression" before January 17) and the remaining chapters before a subsequent date (for example, you will finish Chapter 4 of "Introduction to Regression" before February 28).

After completing a Datacamp course you will be issued a Statement of Accomplishment. You must upload this statement to Quercus by the due date in order to receive credit.

Team assignments

There are three team assignments involving data analysis due on January 31, March 6, and March 20. You will have at least a week to work on these assignments.

You will work in teams of three on these assignments. Therefore, you are asked to form teams of three using the Quercus team-selection tool by January 24.

Learning to work together in teams is a crucial transferrable skill you will use not only in your coursework, but also in your future careers. Support is available if you encounter common teamwork challenges such as:

- Team members feeling left out of the team.
- Team members not responding in a timely manner to communication.
- Division or quality of work among team members being unequal or unfair.

Consult the [Centre for Professional Skills Teamwork Resources page](#) for tips, strategies, and best practices. You can also [book an appointment with a teamwork mentor](#) through the RC Centre for Professional Skills Writing Centre. Teamwork mentors can help you resolve or mitigate conflict, strategize on planning, or improve team communication.

If you are a student registered with Accessibility Services, and extensions are one of your academic accommodations, consult with your Accessibility Advisor about the teamwork in this course.

Quizzes

There will be two quizzes in this course, on **February 14 and April 3, conducted on Quercus, in-class. You will need to bring a laptop to class with a working Internet connection, and be on time to start the quiz as soon as it becomes available on Quercus (if you start late, you will have less time to finish the quiz). The Quercus quiz system does not accept late submissions.**

The quizzes will be based on assigned reading materials, lectures, and class discussions. They will be open-book, open-notes.

Research requirement

Marketing and Organizational Behaviour researchers run experimental studies to test theories about human behaviour. The research requirement is intended to supplement this course's material, by giving you direct exposure to research in these fields. You may fulfill this requirement by:

1. Participation in three hours (credits) of research studies, or
2. Analysis of three research articles, or
3. A combination of research studies and article analyses

Note, this is not an extra credit assignment; credit-hours of participation translate into real percentage values. You will receive one credit for each one-hour of research participation you complete, up to a maximum of three credits.

USING SONA: PRE-REGISTERED ACCOUNT AND COURSE REGISTRATION

To participate in a research study, you will need to sign into our Rotman Behavioural Research Lab (BRL) research participation website (SONA): <https://rotman.sona-systems.com/>. Please add both the Sona Admin, rotman-admin@sona-systems.net, and Behavioural Research Lab, Behavioural.Lab@rotman.utoronto.ca, email addresses to your contact list. This will ensure that registration, password reset links, and important updates regarding your account/study participation are not mistakenly marked as spam.

Former Participants: those with existing BRL credit-pool accounts on SONA can use their previous credentials to log-in, and immediately begin registering for courses and studies. **New Users:** your account has already been created for you by our Lab Manager. This account is linked to your "[Username]@mail.utoronto.ca" email address, and a link to complete the registration has been sent to that address.

Trouble Logging In: if you have overlooked your password registration link, or forgotten details of your log-in information, please use the "Forgot Password" feature on the SONA log-in page to have these credentials sent to your email.

Please familiarize yourself with the "Student Research-Participation Guide" (it will be made available to you on Quercus); this guide, as well as the FAQ on Sona, cover all the pertinent steps and criteria for registering for studies and completing your participation requirement through either study participation or article analyses. Feel free to email Behavioural.Lab@rotman.utoronto.ca if you have any question.

Research opportunities for the Winter 2024 session are anticipated to become available mid-to-late January. The last date for getting this credit is March 31, 2024.

Missed Tests and Assignments

Students who miss a test or assignment for reasons entirely beyond their control (e.g. illness) may request special consideration **within 2 business days** of the missed test/assignment due date.

In such cases, students must:

1. Complete the Request for Special Consideration form: <https://uoft.me/RSMConsideration>
2. Provide documentation to support the request, eg. Absence Declaration from [ACORN](#), medical note etc.

Please note: As of September 2023, students may use the Absence Declaration on ACORN ***one time per term*** to report an absence and request consideration. **Any subsequent absence will require a [Verification of Illness form](#) or other similar relevant documentation.**

Students who do not submit their requests and documentation within 2 days may receive a grade of 0 (zero) on the missed course deliverable.

Since each Datacamp assignment has a long lead time for completion (essentially, you can start working on a Datacamp course as soon as the course goes live on Quercus), you will not get any special consideration for non-submission by the due date (even with required documentation). In other words, for each missed Datacamp submission you will lose 5% of the course grade.

If you miss Quiz 1 for reasons entirely beyond your control, but did do Quiz 2, then your grade on Quiz 2 will carry a weight of 30% (instead of 20%). If you miss Quiz 2 for reasons entirely beyond your control, you will be assigned a makeup quiz on a date to be arranged.

Late Assignments

All assignments are due on Quercus by the date and time specified in Quercus. Late submissions will not be accepted. 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. Depending on the reasons given, late submissions may be penalized by 15% per day.

Statement on Equity, Diversity and Inclusion

The University of Toronto is committed to equity, human rights and respect for diversity. All members of the learning environment in this course should strive to create an atmosphere of mutual respect where all members of our community can express themselves, engage with each other, and respect one another's differences. U of T does not condone discrimination or harassment against any persons or communities.

Commitment to Accessibility

The University is committed to inclusivity and accessibility, and strives to provide support for, and facilitate the accommodation of, individuals with disabilities so that all may share the same level of access to opportunities and activities offered at the University.

If you require accommodations for a temporary or ongoing disability or health concern, or have any accessibility concerns about the course, the classroom or course materials, please [email Accessibility Services](#) or visit the [Accessibility Services website](#) for more information as soon as possible. Obtaining your accommodation letter may take up to several weeks, so get in touch with them as soon as possible. If you have general questions or concerns about the accessibility of this course, you are encouraged to reach out to your instructor, course coordinator, or Accessibility Services.

Original

Normally, students will be required to submit their course essays to the University's plagiarism detection tool 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 tool's reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of this tool are described on the [University's Plagiarism Detection Tool FAQ](#) page from Centre for Teaching Support & Innovation.

Generative AI / ChatGPT

The knowing use of generative artificial intelligence tools, including ChatGPT and other AI writing and coding assistants, for the completion of, or to support the completion of, an assignment, quiz, or any other form of academic assessment, will be considered an academic offense in this course.

Academic Integrity

Academic Integrity is a fundamental value essential to the pursuit of learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T 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](#) 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 procedures outlined in the [Code of Behaviour on Academic Matters](#). If you have any questions 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 U of T or RC resources such as the RC Centre for Professional Skills, the 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 U of T 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 ACORN. For more information visit the [Information Commons Help Desk](#).

Forwarding your utoronto.ca email to a Gmail or other type of email account is not advisable. In some cases, messages from utoronto.ca addresses sent to Gmail 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.

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. Students who have been previously granted permission to record lectures as an accommodation for a disability are excepted. This includes tape recording, filming, photographing PowerPoint slides, Quercus materials, etc.

If permission for recording 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 any way. It is forbidden for a student to publish an instructor's notes to a website or sell them in any other form without formal permission.

Weekly Schedule

Class	Date	Topic	Preparation before class	Due
1	Jan 10	Introduction to marketing analytics	Read: VFW Introduction & Chapter 11	DataCamp courses: 1. Introduction to R 2. Introduction to Importing Data in R
2	Jan 17	1. Customer value 2. Discussion of Pilgrim Bank (A) case	1. Pilgrim Bank (A) case—see discussion questions on Quercus 2. Read: VFW Chapter 5 up to Concept Application 3. DataCamp course: Chapters 1-3 of Introduction to Regression in R	DataCamp course: Introduction to Statistics in R
3	Jan 24	Market segmentation via RFM; lift and gain analysis	Read: BKN Chapter 12 on RFM Analysis up to Section 12.3.1	Team selection due on Quercus
4	Jan 31	1. Market segmentation via k-means clustering 2. Discussion of Sticks Kebob Shops case	Read: VFW Chapter 2	1. Team Assignment 1 on Tuscan Lifestyles case 2. DataCamp course: Unsupervised learning in R
5	Feb 7	Predicting and analyzing sales response via multiple regression	1. Read: VFW Chapter 4 up to Concept Application 2. DataCamp course: Chapters 1-3 of Intermediate Regression in R	
6	Feb 14	1. Quiz 1 2. Discussion of Svedka Vodka case	Svedka Vodka case—see discussion questions on Quercus	
READING WEEK				
7	Feb 28	Predicting and analyzing customer response via logistic regression	1. Read: VFW Chapter 9 up to Concept Application 2. DataCamp courses: Chapter 4 of Introduction to Regression in R and Chapter 4 of Intermediate Regression in R	DataCamp courses: 1. Introduction to Regression in R 2. Intermediate Regression in R
8	Mar 6	1. Conjoint analysis 2. Discussion of Portland Trail Blazers case	Read: VFW Chapter 3	Team Assignment 2 on Retail Relay case
9	Mar 13	Recommendation systems	Read: VFW Chapter 10	
10	Mar 20	1. Text analytics 2. Discussion of Airbnb case	Read: VFW, Chapter 8	Team Assignment 3 on Airbnb case
11	Mar 27	1. Marketing experiments 2. Discussion of Compare.com case 3. Recap of the course	1. Read: VFW, Chapter 6 2. Compare.com case—see discussion questions on Quercus	
12	Apr 3	Quiz 2 on Quercus (cumulative)		

Please note that the last day you can drop this course without academic penalty is March 11.



Other Useful Links

- [Become a volunteer note taker](#)
- [Accessibility Services Note Taking Support](#)
- [Credit / No-Credit in RSM courses](#)
- [Rotman Commerce Academic Support](#)

URL links for print

- ACORN: <http://www.acorn.utoronto.ca/>
- Email Accessibility Services: accessibility.services@utoronto.ca
- Accessibility Services website: <http://studentlife.utoronto.ca/as>
- University's Plagiarism Detection Tool FAQ: <https://uoft.me/pdt-faq>
- The University of Toronto's Code of Behaviour on Academic Matters: <http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>
- Information Commons Help Desk: <http://help.ic.utoronto.ca/category/3/utmail.html>
- Become a volunteer note taker: <https://studentlife.utoronto.ca/program/volunteer-note-taking/>
- Accessibility Services Note Taking Support: <https://studentlife.utoronto.ca/service/note-taking-support/>
- Credit / No-Credit in RSM courses: <https://rotmancommerce.utoronto.ca/current-students/degree-requirements/credit-no-credit-option/>
- Rotman Commerce Academic Support: <https://rotmancommerce.utoronto.ca/current-students/academic-support/>
- Book an appointment with a writing or presentation coach: <http://uoft.me/writingcentres>
- Writing and Presentation Coaching academic support page: <https://rotmancommerce.utoronto.ca/current-students/academic-support/writing-and-presentation-coaching/>
- Centre for Professional Skills Teamwork Resources page: <https://rotmancommerce.utoronto.ca/teamwork-resources>
- Book an appointment with a Teamwork Mentor: <http://uoft.me/writingcentres>