Rotman Commerce
UNIVERSITY OF TORONTO

Course Outline

Course Code	RSM 415 H1 S
Course Name	Strategic Decisions in Operations
Term, Year	Winter, 2026
Course Meets	L101 – Tuesdays 1:00pm – 3:00pm / WO
Web page URL	https://q.utoronto.ca/courses/428105

Instructor Details

Name	Email	Phone	Office Hours
Instructor: Vahid Roshanaei	v.roshanaei@utoronto.ca	416-978-3762	Tuesdays 10:30 am to 12:30 pm and by appointment, Room 419
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If the current in-person office-hour arrangement is not feasible for you due to scheduling conflicts or other plausible circumstances, we can then schedule a meeting at a mutually convenient time. Having decided on the meeting time, feel free to provide me with a Zoom link.

Course Scope, Mission, and Learning Outcomes

The Strategic Decisions in Operations course provides a framework and multiple analytic tools to analyze, evaluate, and optimize the strategic asset and process decisions involved in configuring the "*Operating System*" of a firm. The focus is on making value-creating decisions that are grounded in operational reality. Students will learn that a firm's Operating System is composed of "Assets" and "Processes" and that the Operating System of a firm is uniquely designed to support a firm's business and competitive strategy. **Asset** decisions include capacity sizing, expansion, flexibility, and location. **Process** decisions include strategic and global sourcing (supply management), dynamic pricing and revenue (demand) management, smart technology and digital automation, innovation management, and risk management.

In this course, we adopt a *model- and data-driven approach* where decisions and insights stem from modeling and analyzing real data. The course tools are used in practice by operating managers and consultants. Course tools include:

- **QMacros:** An easy-to-use and simple Queueing software that allows students to analyze risks (uncertainty) in supply and demand processes. This software requires students to statistically analyze a process and determine descriptive statistics of a process, e.g., mean wait time, standard deviation of processing time, coefficient of variations on the supply and demand sides, etc. before they are able to develop their prescriptive models that optimize operational decisions. This software enables students to simultaneously leverage their acquired statistical and mathematical knowledge to prescribe managerial decisions with respect to, for instance, optimal level of resource utilization and number of resources required to match uncertain supply with uncertain demand as cost-efficiently as possible.
- **Excel Solver and Python:** An easy-to-use decision-making tool that allows students to optimize operational decisions and perform sensitivity analysis on the robustness of these solutions for varying values of the decision-making parameters. Having obtained descriptive statistics about a process, students will use Excel solver to solve a few prescriptive linear and integer programming models that provide optimal decisions regarding capacity, inventory, outsourcing, etc. While almost all case studies in this course can be solved using Excel Solver (to prescribe optimal decisions), we limit its use to case studies that make a significant cost difference compared to when decisions are manually calculated. Students can alternatively use Python for our prescriptive models if they have acquired mastery in using Python through other courses.
- **Excel Data Analysis:** An easy-to-use tool that allows students to perform descriptive and predictive analysis on given data. Students will require to extensively use Excel Data Analysis tool to describe process metrics and predict future demands, which constitute fundamental basis for strategic, tactical, and operational decisions.

Course Prerequisites

The prerequisite for this course is RSM 270: **Operations Management.**

Intended audience: Students interested in (1) operations and supply chain management; (2) management consulting; (3) running their own business; and (4) the operational side of private equity, given its ROIC objective where operations typically require the largest investment in assets.

Relationship to other OM&S courses: This elective course builds on the core operations class and also assumes students are familiar with the basics of Accounting, Finance, Economics, and Statistics. The strategic decisions studied in this course require a detailed analysis and understanding of the underlying operations. Thus, this course provides a more strategic level thinking/discussion than the quantitative models students learn in RSM 270. It complements (but it does not overlap with) functionally specialized electives such as *Supply Chain Management* (RSM 370), and/or *Management Science* (RSM 470).

Course Materials

Suggested Readings

The purchase of the following textbook is *optional*:

"Operations Strategy: Principles and Practice" Van Mieghem & Alon (VM&A), 2nd edition

Materials included in lecture slides are mostly based on the contents of the above textbook. In addition to this textbook, I will provide you with separate teaching notes for lecture contents that may not be included in the textbook. Note that slides posted for each lecture and teaching notes are sufficient for exams; therefore, students are not required to read additional materials from the textbook if they do not wish to.

Further course materials made available on Quercus before/after the relevant sessions include:

- Slides
- Excel spreadsheets and Python examples
- Cases

Electronic Course Materials

This course will be using the following electronic course materials:

- **Cases**:

  Case studies have been selected with the objective of exposing you to a wide array of challenging decisions in Manufacturing and Service operations. These operational problems are ubiquitous in the business world, and the solution techniques that you learn to solve these cases have pervasive applications. These solution methods will facilitate the analysis of other similar business problems. There is one recurring theme in all of these case studies: how to optimally configure the "*Operating System*" (a combination of assets and processes and their synergies) to help a firm deliver on its "Value Proposition" to its customers. Specifically, you will learn that each Business Strategy (i.e., price, quality, timeliness, and variety) requires a tailor-made Operations Strategy (i.e., cost, process quality, responsiveness, and flexibility), and the alignment between these two strategies is the key to success. Having solved these case studies, you will be primed to **develop solution methods** for a whole slew of business problems that can potentially **ameliorate** a firm's **Operational Effectiveness Model** while **simultaneously accounting for its Competitive Positioning**.

  The selected cases for this course are as follow:

  i. Chef Davide Oldani and Ristorante D'O, **613080**
  ii. JetBlue Airways: Managing Growth, **609046**
  iii. Scharffen Berger Chocolate Maker (A), **606043**
  iv. Athletic Knit, **9B12D020**
  v. Baria Planning Solutions, Inc.: Fixing the Sales Process, **4568**
  vi. Instacart and the New Wave of Grocery Startups, **515089**,

The above cases must be purchased using the following link: https://www.iveypublishing.ca/s/ivey-coursepack/a1ROF000005gRfF2AU

- **Textbook**:
  - Operations Strategy: Principles and Practice by J. A. Van Mieghem & G. Allon.
    - Publisher: Dynamic Ideas, Charlestown, MA. 2015.

As the instructor, I firmly believe that the textbook is a useful companion to the course as it reinforces/expands some of the concepts that I cover in class; as such, I recommend (but do not require) it. Note that teaching slides and other reading materials will be 100% sufficient for solving case studies and ensuring success on the final exam. The textbook can be purchased using the following link: https://www.amazon.com/OPERATIONS-STRATEGY-Jan-Van-Mieghem/dp/0989910865.

These materials will cost an approximate total of **$37.65 CAD** (mandatory) and **$150.95 CAD** (optional): consider bundling the book with one of your classmates. 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
Class Participation/Attendance	15%	Ongoing
Quizzes (6 quizzes each 2.5%)	15%	Check weekly scheduled on page 6
Case Write Up (4 cases, 10% each)	40%	**Jan. 18th, Feb. 1st, Feb. 24th, Mar. 15th**
Final Term Test	30%	TBD, **In person**

The last day to drop this course is March. 16th, 2026.

Course Format and Expectations

Below, you can find detailed explanations regarding my expectations (and other useful information) for each course deliverable.

Workload. This course challenges you to think through and recommend important operational decisions based on thorough qualitative and quantitative analysis. ***Strategic Decisions in Operations is a topic that is best learned by doing.*** The workload is relatively heavy, but good planning will make it very manageable, and your payoff could be significant. The mix of in-class case discussions and written case studies, quizzes, and the final exam has been designed to develop the skills and understanding you need to gain significant expertise in recommending operational solutions that shore up a firm's business strategy.

- Expect to spend around **7-10 hours** on each of the written case analyses and **2-4 hours** on other in-class discussion cases. These are just guidelines – it may take you more or less time.
- Reading and analyzing cases will help students develop a deeper understanding of the subject matter. The final exam will include some general questions from these cases.
- If you follow lectures closely, preparing for the final exam should take a little time.

Quantitative and qualitative analysis. Excellent design/deployment of Operations Strategy is both an ***art*** and a ***science***. Our discussion will therefore draw on a balanced blend of qualitative and quantitative analyses. Expect the course to require a fair amount of **spreadsheet model development and analysis.**[1] This analysis may at times be quite involved, but it will always be performed with one of the following objectives in mind: (1) to quantify the financial performance of a firm and/or (2) to illustrate and discuss Operations Strategy principles or practical phenomena.

Class Participation (individual, 15%). Your participation grade will depend on your preparedness for participating in class discussions; the quality of your contributions to other discussions; and regular attendance in lectures. There should be enough opportunities for you to participate. To increase opportunities for effective participation, I will occasionally cold-call students. If you feel uncomfortable with being called on in class, please let me know in advance so we can find a solution. Generally, you should contribute to the creation of a positive learning environment. This mostly concerns your *positive externality on the learning of others*. Some key characteristics of valuable contributions are:

- *Relevance*: Are your comments timely and linked to the comments of others?
- *Advancement*: Do your comments take the discussion further or deeper?
- *Fact-based*: Have you used specific data to support the assertions that you are making?
- *Logic*: Is your reasoning consistent and logical?
- *Originality*: Do your comments merely restate the facts, or do they provide new insights?

Attendance and classroom etiquette: You are strongly encouraged but not required to attend lectures. I consider 20% of the class participation grade for in-person *engaged* class attendance and 80% for *effective* participation in discussions. We will discuss four additional cases in class: Case i, ii, vii, and viii. You will have enough opportunities for class participation to achieve a satisfactory participation grade. If you do attend lectures, please observe the following rules: *(i) Be on time and (ii) stay for the entire session*.

Quizzes (individual, 15%): We will have **six** short online quizzes (mostly MCQs) for this course. Each quiz bears 2.5% of the total grade. These quizzes are based on important highlights/takeaways in the assigned case studies and reading materials. Each quiz may include up to 10 MCQs to which students must provide a response at the beginning of each

[1] **Optional Python code will be provided for a subset of lectures for students who wish to specialize in data science, allowing them to implement spreadsheet-based analyses in Python. Please note that all assessments are based on Excel, not Python.**

lecture. It is through these quizzes that I can ascertain your level of preparedness for in-class case discussions and your enthusiasm for proactive learning.
Case analyses (group, 40%): There are **four** case analyses expected to be done in groups of preferably 4 students. In your assignments, you will be expected to also figure some things out on your own prior to our class discussion rather than only apply concepts already covered. This format is designed to help you develop important problem-solving skills in Strategic Decision in Operations. See the "Guidelines for Full Case Analyses" at the end of this course syllabus and write your reports accordingly.
Final assessment (individual, 30%): The final exam is **in person.** Your final exam will consist of conceptual and quantitative questions. Conceptual questions include all topics covered in the lectures, case studies, and class discussions.

Support is available through the RC Centre for Professional Skills (CPS) for students who would like help or feedback on their writing or speaking (presentations). CPS offers both individual and group appointments with trained writing instructors and presentation coaches who are familiar with the RC program and common types of business assignments. You can also access your college Writing Centres for help with written assignments.

To book an appointment for writing or presentation coaching, go to uoft.me/writing centres and select "Rotman Commerce Centre for Professional Skills" and register for a WCONLINE account or log in to your account (if you have one). For group assignments, assign one student from the group to book an appointment for the whole group.

2. Register for an account using your @mail.utoronto.ca email address and follow the confirmation prompts you receive via email. At the bottom of the registration page, click on "yes" next to "include iCal links with appointment confirmation messages".
3. Once your registration is complete, select the schedule: Writing and Presentation Coaching on the drop-down menu.
3. Click on the white box for an appointment slot. Each appointment will be 45 mins. You may attach a draft of your assignment or any other documents. If your draft is not ready, you may also share a Google link (or other live document sharing link) of your draft during your appointment.
4. You will receive a confirmation email with your appointment details and meeting link.

For questions or registration support, please email rotmancommerce.cps@utoronto.ca.

In addition to appointments offered by the RC Centre for Professional Skills, all RC students have access to their College Writing Centres. Students who require additional support and/or tutoring with their writing skills are encouraged to visit the Academic Success Centre (http://www.studentlife.utoronto.ca/asc) or one of the College Writing Centres (writing.utoronto.ca/writing-centres). These Centres, as well as the RC Centre for Professional Skills, 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**.

Team or Group Assignments

All analysis cases require students to work in teams of 3-4. Learning to work together in teams is a crucial transferable 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.

Missed Tests and Assignments (including mid-term and final-term assessments)

Students who miss a term test or assignment for reasons entirely beyond their control (e.g. illness) may request special consideration **within 2 business days** of the missed midterm/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, Verifcation of Illness Form etc.

Please note: 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.

When a student misses an exam, the instructor will either offer a make-up test or re-weight the other deliverables to account for the missed exam. This choice will be made by the instructor.

Late Assignments

*All assignments are due on the date and at the time specified on Quercus. Late submissions will not be considered for grading. However, for **one** late submission per student during the semester, I reserve the right to accept the work with a penalty of **35% per day of lateness**.*

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.

Generative AI / ChatGPT

Students are permitted to utilize Generative Artificial Intelligence (AI) tools while completing assignments within this course. However, it is essential to comprehensively document this usage and subsequently upload the documentation as an appendix (or a separate file) upon request for each assignment. Should the instructor require the submission of this documentation, students are obliged to promptly provide the file to the instructor. This documentation should include what tool(s) were used, how they were used, and how the results from the AI were incorporated into the submitted work. Failure to adhere to this guideline, and instances where the usage of AI is detected without appropriate citation, could result in the forfeiture of 100% of the grade allocated for that particular assignment, both for you and your teammates. It is important to emphasize that the use of Generative AI tools is exclusively permissible for assignments and case studies; their utilization is strictly prohibited during examinations, whether administered online or in-person.

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.

Weekly Schedule

Session	Date	Topics	Readings (VM&A, 2nd Ed.)	Assignments	
				Individual	Group
1	**Jan.** 6	Operations Strategy: Concept and VCAP Framework; Qualitative Case Debrief **613080**	Chapters 1 & 3, **Case 613080**	**Quiz 1**, Case discussion	
2	**Jan.** 13	Value Creation and Operations: The Investor View; Case Debrief: **Case 609046**	Chapter 2, **Cases 609046**		Finalize Groups
3	**Jan.** 20	Quant. Case Debrief: **Case 613080;** Capabilities, Competition, and Tradeoffs (time permitting)		**Quiz 2**, Case discussion	**Submission: Jan. 18th**, Quercus
4	**Jan.** 27	Process Analysis of Multiple Flow Units and Throughput Loss; Strategic Capacity Sizing I	RSM 270 Process Analysis Lecture; Chapter 4		
5	**Feb.** 3	Case Debrief: **ScharffenBerger;** Strategic Capacity Sizing II	**Case 606043**	**Quiz 3**, Case discussion	**Submission: Feb. 1st**, Quercus
6	**Feb.** 10	Dynamic Capacity Timing and Expansion; Capacity-Inventory-Waiting Trade-off	Chapter 5 and Appendix B	Download QMacros	
No lecture	**Feb.** 17	Study week.			
7	**Feb.** 24	Continuation of Dynamic Capacity Expansion; Case Debrief: **Athletic Knit**	**Case 9B12D020**	**Quiz 4**, Case discussion	**Submission: Feb. 24th**, Quercus
8	**March** 3	Asset and Network Flexibility, and Resource Pooling	Chapter 6 & Teaching Notes		
9	**March** 10	Asset Reconfiguration and Resource Scheduling	Teaching Notes		
10	**March** 17	Case Debrief: **Baria Solution Planning**	**Case 4568**	**Quiz 5**, Case discussion	**Submission: Mar. 15th**, Quercus
11	**March** 24	Demand and Revenue Management: Predictive and Prescriptive Pricing Models	Chapter 9		
12	**March** 31	Improvement and Innovation	Chapter 11, **Cases 515089**	**Quiz 6**, Case discussion	
Final Exam	TBA by FSA				

All assignments and case study submissions are generally due on **Sundays at 11:59 p.m**. To ensure you do not miss any deadlines, please regularly check Quercus, as some due dates may be adjusted to enhance the learning experience and improve the quality of submissions.

Course Schedule: Details

The schedule below details the topics, readings, and assignments for each week. However, we will make attempts to follow the course schedule as closely as possible. Reading guidelines**:**

- Read *all* cases before they are discussed in class, *whether a submission is required or not*.
- Chapters from VM&A are assigned as background reading with the material being covered. They are best reviewed after the lecture to reinforce the concepts discussed. The book also provides technical details that may not be discussed in class.
- I recommend that you review certain examples covered using the Excel spreadsheets.

Session 1: Operations Strategy: Concept and VCAP Framework

Read: VM&A Chapters 1 and 3

Read*: Chef Davide Oldani and Ristorante D'O*

Learning objectives for this session include:

- How to analyze the **V**alue Proposition of a firm and its Strategic Positioning in the Market
- What Operational **C**ompetencies to develop to deliver on the **V**alue proposition to customers
- How Operations Strategy can assist in developing required Operational **C**ompetencies through the optimal configuration of **A**ssets and **P**rocesses such that it aligns closely with the Business Strategy
- How to apply the **VCAP** framework to develop an "Operational Business Model" that **aligns** the designed "Operations Strategy" with "Business Strategy"
- How to analyze Operational Trade-offs, e.g., Productivity versus Quality
- How to improve Operational Efficiency through Specialization (Focus)
- Which tools to use to tailor processes to business goals:
    - Product-Process Matrix
    - Strategic-Operational Auditing
    - Balanced Score Card

Case Discussion I: *Chef Davide Oldani and Ristorante D'O*

Learning objectives for this case include:

- Ascertaining the Value Proposition of the Ristorante D'O,
- Applying VCAP framework to determine the Operational Business Model of the Ristorante D'O
- Understanding how to align a predominantly cost-based Operational Business Model of a 1-Michelin Star Restaurant (Ristorante D'O) to its price-based Value Proposition

Session 2: Value Creation and Operations: The Investor View

Read: VM&A Chapter 2

Learning objectives for this session include:

- Understanding basic connection between Operations (Management) and (Corporate) Finance; two courses that are rather remote from each other in business schools
- Applying a set of tools that allows firms (i) to analyze and measure their operational effectiveness and (ii) to identify those operational areas whose improvement leads to the creation of higher value for customers
- Developing basic understanding of how one can perform Operational Forensics on a firm's operations via the construction of the Return On Invested Capital (ROIC) Tree
- Performing sensitivity analysis on each of these operational levers to ascertain the percentage of change in ROIC as a result of 1% change in these operational levers

Case Discussion II: *JetBlue Airways: Managing Growth*

Before the lecture, I will post an assignment-style document for this case. You are expected to prepare tentative answers to the questions in the document for ***class discussion***; however, no submission is required for this session. There are two sets of learning objectives for this session.

- The set of **learning objectives 1** include:
    - Comprehending how the acquisition of an asset (a new airplane) will impact the operations strategy of the JetBlue Airways
    - Comparing the economics of two assets (airplane types) and key drivers of profitability for each asset type
    - Using Excel Data Analysis tool to develop a predictive model to ascertain the price of fuel in future
    - Judging whether the new asset (airplane) should have been acquired by the JetBlue Airways or not
    - Tackling the dilemma of JetBlue Airways on how to manage its growth deceleration process
- The set of **learning objectives 2** include:
    - Developing a spreadsheet (or Python) model to capture the ROIC Tree for the JetBlue Airways
    - Leveraging this automated spreadsheet (or Python) model to identifying factors (e.g., number of flights per day, yield, load factor, fuel price, and flight length) influencing the ROIC of the JetBlue Airways and pinpointing the one that has the greatest impact on its ROIC
    - Ascertaining the JetBlue Airways strategy going forward

Session 3: Ristorante D'O Case Debrief and Capabilities, Competition, and Tradeoffs (time permitting)
Submit: *Report for Ristorante D'O*
Read: VM&A Chapter 3
The first set of learning objectives includes:

- Debriefing the *Ristorante D'O* case and learning how to construct an ROIC tree for a one-star Michelin restaurant.
- Learning how to leverage the ROIC tree to identify operational changes that maximize ROIC.
- Learning how to perform sensitivity analysis on key operational parameters.
- Ascertaining whether such operational changes are aligned with the business strategy.
- Learning how to use the ROIC tree to guide expansion decisions for *Ristorante D'O*, either by introducing new products and services or by replicating the existing business model in new markets.

The second set of learning objectives include

- Assessing whether a firm's strategic market position is resilient to competitors' actions (attacks), introducing the concept of strategic position defensibility.
- Using the strategic position defensibility analysis to identify how assets and processes should be strengthened to withstand competitive attacks, ensuring a sufficiently differentiated and defensible market position.

Session 4: Process Analysis of Multiple Flow Units and Throughput Loss; Strategic Capacity Sizing I
Read: VM&A Chapter 4
The first set of learning objectives, building on our learning from ***Process Analysis in RSM 270***, includes:

- Calculating process capacity for a process that produces multiple product types with varying processing times at each stage.
- Extending this calculation to account for losses of input as the flow unit moves from upstream to downstream stages.

I will post separate lecture slides for the process analysis and expect students to rigorously review it before the lecture.
The second set of learning objectives include

- Explaining the concept of capacity strategy and discussing its challenges and importance.
- Envisioning the future using four levels of uncertainty.
- Incorporating uncertainty to value capacity and optimizing capacity investment.
- Picking a position in the **Capacity-Inventory-Waiting** strategy triangle.
- Choosing optimal sizing of product and service companies
- Leveraging pertinent tradeoffs to derive analytical solutions to find the optimal operations strategy:
    - Level or Make-to-Stock Strategy
    - Chase or Make-to-Order Strategy
    - Hybrid Level-Chase Strategy

Session 5: Case III: ScharffenBerger Chocolate Maker (A)
Submit: *Report for ScharffenBerger Chocolate Maker (A)*
In this session, I will debrief the ScharffenBerger (SB) Chocolate Maker (A) case. This case is about a chocolate manufacturer whose value proposition is to produce "**America's Finest Dark Chocolate**". The case suggests that this manufacturer has been able to deliver on its value proposition to its customers and due to this recognition, the demand for its products has increased substantially; demand is estimated to be continued this way at an even higher rate. One of the competencies of the SB is the way it has designed its manufacturing processes to produce chocolate products from "**beans to bar**". The management of SB has faced a strategic decision with regard to what fraction of the existing and future demands must be satisfied. In view of this decision, the SB management must ascertain the maximum amount of demand that can be satisfied by the existing number of shifts, human resources, and machineries, and also the required process changes needed for each level of demand satisfaction.
Learning objectives for this session include:

- Comparing the process-enabled business model of SB with other competitors in the market
- Understanding the operational details of a chocolate-making processes
- Determining the capacity of each subprocess and the entire process in terms of kg of chocolate
- Predicting the amount of demand increase for SB in future years
- Developing optimization spreadsheet (or Python) model to optimize cost for each level of demand prediction
- Developing optimization spreadsheet (or Python) model to decide whether the new machineries (the Ball Mill) must be purchased to increase capacity
- Learning about the challenges of integrating a new machinery (Asset) within an established manufacturing system
- Establishing the necessity of aligning operational decisions with a firm's strategic positioning

Having finished the case debrief, we continue our discussion on Strategic Capacity Sizing and we start talking about Capacity Timing.

Session 6: Strategic Capacity Timing and Investment

Read**:** VM&A Chapter 5 and case *Athletic Knit (AK)*
In this lecture, I will talk about economies of scale in strategic capacity acquisition. I will familiarize you with the time value of money and its relationship to the timing of capacity acquisition. I will reintroduce the concepts of first- and second-order variability that you have learned in the course of Operations Management, RSM 270. We discuss the operational challenges pertinent to having the two sources of variability in the manufacturing processes. You will learn how to use QMacros software to quantify the amount of variability in the supply and demand processes of a firm. Specifically, you will use QMacros for the queueing systems you learned in RSM 270. QMacros software will enable you to optimize capacity given the acceptable average wait time for your customers or given the average lead-time you have promised them.

Session 7: Debrief of Athletic Knit Case and Continuation of Capacity Timing
Submit: *Report for Athletic Knit (AK).*
In this session, I will debrief the "Athletic Knit (AK)" case. AK is a manufacturer of sportwear located in downtown Toronto. The AK management is contemplating improving its financial performance by improving the effectiveness of its production strategy and inventory policies. There is a conflict between two members of the AK management team regarding which production strategy must be adopted to improve the financial profitability of the firm while maintaining the strategic position of this firm in terms of **timeliness**. One of AK's value propositions to its customers is that it produces and delivers orders within two weeks during the season. The choice of the production strategy must ensure the lowest cost of production while achieving an average two weeks of leadtime for customers.
Using the AK data, the learning objectives of this session include:

- Understanding the business strategy of AK
- Getting familiar with various production strategies: (i) Level Strategy, (ii) Chase Strategy, and (iii) a hybrid level-chase strategy
- Getting familiar with operational requirements associated with each of these strategies
- Quantifying the cost of above production strategies and designing a tailored production-inventory strategy for AK, while accounting for its leadtime promise to customers
- Putting together all these analyses and resolve the problem using QMacros and Excel Solver (linear programing model)
- Developing a linear programming model (which can be formulated in Excel or Python) that optimizes the aggregate production plan of the Athletic Knit.

Session 8: Asset and Network Flexibility and Resource Pooling
Read: VM&A Chapter 6 and Teaching Notes
In this lecture, you will learn about the sources of flexibility in assets and processes. You will learn further about the negative impact of second-order variability on the performance of a firm. You will learn how incorporating flexibility into processes will help drastically mitigate the negative impact of first- and second-order variability. When encountered with high customers demand volumes, which usually culminates in excessive wait time, you will learn which part of the process must be redesigned or influenced so you can reduce this wait time to an acceptable level. This lecture addresses the system design for those customers who are willing to wait long enough to receive their service or products. That is, no customer will leave the system due to long wait time (e.g., a patient requiring a kidney transplant).
The additional learning objectives of this session include:

- Understanding the factors contributing to the necessity of choosing a flexible asset to create competitive edge,
- Distinguishing the circumstances under which multiple dedicated assets are as useful as having one flexible asset,
- Understanding the levers that a flexible asset provides to minimize costs: economies of scale, pooling effect, and switching options,
- Leveraging Excel Solver (and Python) to develop a stochastic linear programming model to determine the optimal level of flexibility, learning that "a little flexibility goes a long way",
- Leveraging Excel (and Python) to simulate many correlated demand scenarios for multiple products and using this demand input for our larger-scale stochastic optimization problem to determine the optimal asset flexibility level, and
- Understanding sources of flexibility in supply chain network design: unidirectional, short chain, long chain, and full flexibility.
- Comprehending how asset flexibility in the presence of multiple products can create different hedging positions for a firm, and getting thus familiar with mean-variance analysis given the optimized level of asset flexibility.

Session 9: Capacity Planning for Service Systems: Sequential Servers, Blocking, and Queue Disciplines (Scheduling)
Read: Teaching Notes and Case Study *Baria Planning Solutions, Inc.: Fixing the Sales Process*
In this lecture, you will extend your knowledge of second-order variability to (i) *heterogenous* customers, (ii) systems with *finite* spaces (number of servers and waiting area), which leads to blocking of customers, (iii) *impatient customers* who may leave the system due to long wait time or queue length before they receive their services, and (iv) systems with *sequential servers*. You will learn, among other objectives, when parallel-server systems are preferred over sequentially-positioned-sever systems. You will also learn how a firm can achieve operational effectiveness via *scheduling* of its customers (changing the queue discipline from First-Come-First-Served to other suitable queue disciplines) if it can take advantage of prior information regarding its customers (e.g., non-random arrivals of orders, orders with a specific due date, their specific

processing time, etc.). This lecture will teach you how to integrate theories in queueing and scheduling to design a system that is robust to the first- and second-order variability.

Session 10: Baria Planning Solutions, Inc.: Fixing the Sales Process
Submit: *Report for Baria Planning Solutions, Inc.: Fixing the Sales Process*
In this session, I will debrief the Baria case. This case is the pinnacle of this course in which you will be required to synthesize all the techniques you learned in previous lectures. The Baria case integrates eclectic complexities pertinent to a real operational decision-making process. That is, students must be able to integrate descriptive, predictive, and prescriptive analytics models to be able to provide a reasonable managerial recommendation for improving the process of Baria Consulting Firm Having solved the Baria case, you will be able to tackle various real-world operational problems because this case will expose you to many operational trade-offs that have concurrently befallen a firm.
The additional learning objectives of this session include:

- Leveraging Excel to expand our knowledge from a single-stage process to a multiple-stage process, considering the propagation of variability from one stage to another.
- Learning how to compute the aggregate variance of service times for different flow units given their individual averages and standard deviations.
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Session 11: Demand and Revenue Management
Read: VM&A Chapter 9
This lecture is a soft introduction to the "Service Operations Analytics" course. In this lecture, you will learn that when the amount of supply cannot be changed, you have to change the amount of demand. You will learn pricing strategies: *cost-based*, *market-based*, and *value-based*. In this lecture, you will be familiarized with the ***predict (estimate)-then-prescribe (optimize)*** approach to pricing. You will learn that the relationship between price and demand can be approximated using different functional forms: (i) *linear*, (ii) *constant elasticity*, and (iii) *logit*. To ascertain the true relationship between price and demand, you will learn how to employ **predictive models to estimate demand** for varying values of price. Once such determination is made, you will learn how to leverage this functional demand form to develop **prescriptive models to optimize prices** of a product in different markets and the timing of promotions to maximize profitability.
The additional learning objectives of this session include:

- Learning the first prescriptive model that demand
- Learning the first prescriptive model that simultaneously optimizes the fraction of demand given the price.

Session 12: Case Debrief VI: TBD
Read: *Instacart and New Wave of Grocery Startups*
In this session, I will debrief the following cases:

- Case VI: Instacart and New Wave of Grocery Startups

In these cases, you will learn about a firm which has taken a pioneering initiative to develop an uberized model for grocery shopping. You will learn how an asset-light business model can be developed in an industry whose major players have long adopted an asset-heavy business model (e.g., Webvan and Peapod). We will discuss the **Value Proposition** of Instacart and its **Operational Business Model** using the VCAP framework we learned during the semester. In particular, you will learn about **Scale** and **Uncertainty** of Instacart order picking and delivery operations and their impact on the profitability of the Instacart business model. Additionally, you will learn the operational levers that enable such a business model and their adequacy.

Additional Recommended Readings

- *Managing Business Process Flows: Principles of Operations Management* by Anupindi, Chopra, Deshmukh, Van Mieghem, and Zemel (2nd edition, Pearson Prentice Hall).
- **Matching Supply with Demand: An Introduction to Operations Management**, 4th Edition, By Gerard Cachon and Christian Terwiesch (available at the UofT bookstore).

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