

## Course Outline

<b>Course Code</b>	RSM 370 H1 F
<b>Course Name</b>	Supply Chain Management
<b>Term, Year</b>	Fall, 2024
<b>Course Meets</b>	Tuesday 3:00 - 5:00 pm – WO
<b>Web page URL</b>	<a href="https://q.utoronto.ca/courses/351756">https://q.utoronto.ca/courses/351756</a>

### Instructor Details

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- I will ***always*** be available after each lecture to take your questions. If this arrangement does not work for you, you can send me an email to arrange for in-person or online office hours. In-person office hours will be held in office 419 in the North building and online office hours will be held in zoom (<https://utoronto.zoom.us/j/6433982051>). **Please include RSM 370 in the title of your emails.** Emails will be responded to at most within 2 business days.
- TAs are responsible for the grading of all deliverables of this course.

### Scope, Mission, and Learning Outcomes

Supply chains are networks of organizations that supply and transform materials and distribute final products to customers. This course views the supply chain from a general manager's perspective. Supply chain management represents a great challenge as well as a tremendous opportunity for most firms. If designed and managed properly, supply chains are a crucial source of competitive advantage for both *manufacturing* and *service* enterprises. **There is a realization that no company can do any better than its supply chain.** This becomes even more important as product life cycles are shrinking, product and service variety is growing, and competition is intensifying. In this course, students will learn how to *coordinate decisions* among different stages of a supply chain such that the *surplus of the entire chain is maximized*.

### Course Prerequisites

The prerequisite for the course RSM 370 is **RSM 270: Operations Management and the completion of 9.0 credits.**

### Course Materials

#### Required Readings

- **Textbook:** "Supply Chain Management: Strategy, Planning, & Operation," Chopra & Meindl (C&M), 7<sup>th</sup> edition (*for North America*). The online version of this textbook would be a good choice for students.

*Important: All the cases, readings, and problems refer to this edition. If you have an older edition or choose to get the Global Edition, make sure to compare the reading references with someone who has access to the 7th edition for North America. Note that slides posted for each lecture are sufficient for exams and students do not require reading additional materials from the textbook if they do not wish to.*

- Further course materials made available on Quercus before/after the relevant sessions
  - Slides
  - Excel spreadsheets for C&M examples
  - Games
  - Cases

Other supply chain management textbooks that may be of interest:

- “Modeling the Supply Chain,” J. F. Shapiro.
- “Designing and Managing the Supply Chain,” D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi.
- “Inventory Management and Production Planning and Scheduling,” E. Silver, D.F. Pyke, R. Peterson.
- “Business logistics Management,” R. H. Ballou.
- “Strategic Logistics Management,” D.M. Lambert and J.R. Stock.
- “The Management of Business Logistics,” J.J Coyle, E.J. Bardi and C.J. Langley.
- “Logistical Management,” D.J. Bowersox, D.J. Closs, O.K. Helferich.

Other business books that may be of interest:

- “Clock Speed,” C.H. Fine
- “Mass Customization,” by B. J. Pine; “Markets of One,” J.H. Gilmore and B.J. Pine
- “Towards a Better Supply Chain,” C.C. Poirier
- “Time Based Competition,” J.D. Blackburn
- “Competing Against Time,” G. Stalk, Jr. and T.H. Hout
- “Balanced Sourcing,” T. M. Laseter

## Electronic Course Materials

This course will be using the following electronic course materials:

- **Cases:**
  - The Uncle Coco’s Magic Shop Game must be purchased via the following link:
  - The Rubicon Global case must be purchased via the following link:
    - The above two cases must be purchased using the following link:  
<https://www.iveypublishing.ca/s/ivey-coursepack/a1ROF00001TTkP2AW>
- **E-text:**
  - Supply Chain Management: Strategy, Planning, and Operation, 7th edition
    - <https://www.pearson.com/en-ca/subject-catalog/p/supply-chain-management-strategy-planning-and-operation/P200000005863/9780137502844>
- These materials will cost an approximate total of **79.88 CAD: 11.89 CAD (cases) and 67.99CAD (e-text)**. The use of these materials complies with all University of Toronto policies which govern fees for course materials. I highly recommend purchasing the e-text and sharing the cost with one of your teammates.
- **Games:** We play four online/offline games in this course:
  - Online Beer Distribution Game (**BDG**), offline Newsvendor Game (**NVG**), an in-person Contract **Negotiation Game**, and the offline Supply Chain Disruption Game (**SCDG**).
  - These games are paid for and available at: <https://games.fathomd.com/>
  - I will provide you with a pass code before each game is played.

## 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/quizzes	10%	Ongoing
2 Preparatory Assignments, each 2.5%	5%	<b>Oct. 1st</b> and <b>Oct. 11<sup>th</sup></b>
4 Simulation Games, each 2.5%	10%	Weekly Schedule, <b>page 8</b>
Case Write Up (two cases, 10% each)	20%	<b>Sep. 23<sup>rd</sup></b> and <b>Nov. 11<sup>th</sup></b>
Mid-Term Test	25%	<b>Oct. 22<sup>nd</sup> to 25<sup>th</sup></b> , <i>Take-home</i>
Final Term Test	30%	TBD, <i>Take-home</i>

## Course Format and Expectations

**Workload.** This course challenges you to think through and recommend important supply chain decisions based on thorough qualitative and quantitative analysis. ***Supply Chain Management 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 written case studies, assignments, midterm, and final exams is designed to develop the skills and understanding you need to gain significant supply chain management expertise.

- Expect to dedicate **2-3 hours** to designing successful strategies for winning each game we play in class. These strategies will be formulated based on the materials covered in the lecture slides and, potentially, relevant chapters from the textbook. To ensure your success in completing these assignments (games), please follow these steps:
  - **Active Lecture Participation:** Actively engage during lectures, where I will outline the educational goals associated with each game.
  - **Prompt Reading of Instructions:** As soon as I upload the game instructions on Quercus, make it a priority to thoroughly read and understand them.
  - **Strategy Formulation:** Develop an effective strategy to win each game by leveraging the concepts covered in relevant lectures.
  - **Submission to Quercus:** Share your winning strategy by submitting it to the Quercus platform.
  - **Participation in Game Debrief Lectures:** Attend the debrief lecture, during which I will provide insights into the successful strategy for the game.
- Each student should plan to allocate approximately **7-10 hours** for each written case analysis. However, please note that these timeframes are flexible, and your actual time investment might vary. It is strongly advised not to delay working on these assignments until the day before they are due. Doing so may result in finding the assignment considerably more challenging to tackle.
- Engaging in reading and dissecting these cases is instrumental in fostering a more profound comprehension of the subject matter. Notably, the mid-term and final exams could encompass questions drawn from these cases.
- Paying meticulous attention during lectures and staying in sync with the curriculum should streamline your preparation process for the midterm and final exams.

**Quantitative and qualitative analysis.** Good supply chain management 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 modeling and analysis***. 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 supply chain decisions and/or (2) to illustrate and discuss supply chain principles or practical phenomena.

**Class Participation** (individual, 10%). Your participation grade will depend on your preparedness for participating in class discussions; the quality of your contributions to other discussions; regular attendance in lectures and pop-up quizzes during lectures. 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. 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 farther 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 30% of class participation grade for in-person *attentive* lecture attendance and 70% for effective participation in discussions. If you do attend lectures, please observe the following rules: (i) *be on time* and (ii) *stay for the entire session*.

**Case Discussions.** Another method through which students can accrue class participation points is by actively engaging in discussions pertaining to the cases "**Seven Eleven Japan**" (first lecture) and "**Rubicon Global**" (last lecture), as well as by providing responses to *associated quizzes*.

**Case analyses** (group, 20%). There are two case analyses to be done in **groups of preferably 4 to 5 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 things already covered. This format is designed to help you develop important supply chain management problem-solving skills. See the "**Guidelines for Full Case Analyses**" at the end of this course syllabus and write your reports accordingly.

**Peer Evaluation for Group Work.** I highly recommend that each member of the group actively contributes to every facet of the group assignment. This approach is crucial as it ensures a comprehensive understanding of all aspects of the course, rather than only focusing on the assignment segment one personally handled. It is strongly advised that each team member thoroughly assesses the submitted report and offers constructive feedback to fellow team members. This collaborative practice serves to enhance the overall quality of the final submission and fosters awareness of the content incorporated by other team associates. *Importantly, the purpose of peer evaluation is not to assign grades to the work done by team members.*

**Mid-term Exam (Individual, 25%).** The mid-term exam will be administered as a take-home assessment, conducted online, and open-book in nature. This exam will encompass the material presented in **the first six lectures** of the course. Chapters 1-11, excluding Chapter 7, will be covered. The exam comprises two distinct sections:

- **Multiple-Choice Questions (MCQ):** The MCQ section must be completed within 60 minutes from the time of initiation.
- **Descriptive/Numerical Questions:** For the descriptive/numerical segment, students will be granted less than 60 hours, contingent on the specific questions included in the exam. Responses must be uploaded to Quercus, either in a doc or pdf file, prior to the stipulated deadline. **Late submissions will not be considered for grading.** The exam will encompass both conceptual and quantitative questions. When addressing quantitative questions, students are encouraged to reference the spreadsheet models provided for each lecture. Conceptual questions will encompass all subject matter explored in lectures, case studies, and class discussions.

The fundamental aim of the take-home exam is to enable you to review and synthesize the course concepts you have acquired. This approach is designed not solely to evaluate your capacity to respond within time constraints, but rather to assess your ability to comprehend and synthesize the key supply chain principles. Consequently, the exam will gauge your grasp of core concepts, prioritizing understanding over rote memorization.

**Final assessment** (individual, 30%). The final exam will be **take-home and online**, and it will include lectures covered after the mid-term exam (**Chapters 4, 12-15, and 17**). It will consist of conceptual and quantitative questions. For quantitative questions included in the exam, students can consult with the spreadsheet's models provided for each lecture. Conceptual questions include all topics covered in the lectures, case studies, and class discussions.

**Potential grade disputes.** All grade disputes must be submitted in writing within a week of an assignment/exam being returned. I reserve the right to regrade the entire assignment/exam, and possibly lower your grade if I find that I overlooked a mistake.

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. You can [book an appointment with a writing or presentation coach](#) through the RC Centre for Professional Skills Writing Centre. For more information about writing centres, student supports, and study resources, see the [Writing and Presentation Coaching academic support page](#).

## Team or Group Assignments

To solve case studies, students require to work in teams of 3-4. 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.

## Missed Tests and Assignments

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, e.g., 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.

*The weight of the midterm exam will be transferred to the final exam for those students who have missed the mid-term exam due to plausible and approved reasons. I, however, strongly encourage students not to miss the mid-term exam as the final exam covers more technical contents.*

### *Late Assignments*

All assignments are due on the date and at the time specified in Quercus. Late submissions will normally be **penalized by 20%** if the assignment is not received on the specified date, at the specified time. A **further penalty of 50%** will be applied to each subsequent day. 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.

## 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 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 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	Topics & Required Readings	Submit/due-date
Mid-term coverage		<b>Framework: Supply Chain Design, Planning &amp; Operation</b>	
	<u>1</u> Sep. 3	C&M 1 – 3; <i>Seven-Eleven Japan Case</i>	Respond to MCQs, Sep. 9 <sup>th</sup> , 11:59 pm
		<b>Designing the Supply Chain Network: Facility Decisions</b>	
	<u>2</u> Sep. 10	C&M 4 - 5; Network Design Under <i>Deterministic</i> Demand	<i>Bio Pharma, Inc.</i> , Finalize groups by Sep. 10 <sup>th</sup>
	<u>3</u> Sep. 17	C&M 6; Global Network Design Under <i>Stochastic</i> Factors	
		<b>Planning Demand and Supply in a Supply Chain</b>	
	<u>4</u> Sep. 24	C&M 8 - 9; Sales & Operations (S&OP) Planning	<i>Bio Pharma report</i> , Sep. 23 <sup>th</sup> , 11:59 pm
		<b>Coordination &amp; Managing Cycle Inventories</b>	
Final exam coverage	<u>5</u> Oct. 1	C&M 10; Lack of Coordination, Bullwhip Effect, and Remedial Strategies; Beer Distribution Game (BDG)	<i>Upload your winning BDG strategy, Assignment 1</i>
	<u>6</u> Oct. 8	C&M 11; Coordination and Economies of Scale in a Supply Chain (Cycle Inventory)	<i>ALKO</i> , Finalize groups by Oct. 7 <sup>th</sup> , <i>Assignment 2</i>
		<b>Managing Safety Inventories</b>	
	<u>7</u> Oct. 15	C&M 12; Managing Uncertainty in a Supply Chain: <b>Safety Stock</b>	<i>Upload your winning Newsvendor Game strategy</i> , 11:59 pm, Oct. 14 <sup>th</sup>
	<u>8</u> Oct. 22	<b>No lecture; Take-home Mid-term Exam: the exam covers the first six lectures: Chapters 1-11, excluding chapter 7.</b>	Release 3 pm on Oct. 22 <sup>nd</sup> , due on Oct. 25 <sup>th</sup> , 11:59 pm
	<b>Study Week</b>	No lecture	
	<u>9</u> Nov. 5	C&M 13; Linking Product Availability To Profits <b>Guest Speaker</b>	<i>ALKO report</i> , Nov. 11 <sup>th</sup> , 11:59 pm
		<b>Sourcing and Supply Chain Coordination</b>	
	<u>10</u> Nov. 12	Supply Chain Coordination through Contracts; C&M 15	<i>Upload your practiced contract</i>
	<u>11</u> Nov. 19	Exercising the Uncle Coco's Magic Shop game in class: 25 minutes Debrief of the Uncle Coco's Magic Shop game: 45 minutes Supply Chain Disruption Game (SCDG): 40 minutes	<i>Upload real contract Practice Disruption Game</i>
		<b>Sustainability and the Supply Chain:</b>	
	<u>12</u> Nov. 26	Debrief of the SCDG C&M 17; Rubicon Global Case Discussion	Respond to MCQs, Dec. 7 <sup>th</sup> , 11:59 pm
<b>Final Exam</b>	<b>Take-home/online</b> final exam; Chapters 4; 12-15, and 17	TBA, Between Dec. 6 <sup>th</sup> to Dec. 21 <sup>st</sup>	

Please note that the last day you can drop this course without academic penalty is **November 4, 2024**.

### **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 C&M 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.

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### **Session 1: A Framework for Supply Chain Design, Planning, and Operation**

We will discuss supply chain management and its importance for business success. We will discuss different views of a supply chain and raise a variety of supply chain related questions that need to be answered by any firm. Our goal is to develop a framework within which supply chain decisions may be analyzed and appropriate tradeoffs considered. We will define overall performance measures for a supply chain and establish initial links to the drivers that a supply chain designer or manager may control. We will introduce the notion and importance of tailoring the supply chain. This will be an important concept that we will refine in the context of different drivers throughout the course. Supply chain decisions will be divided into three categories - strategic/design, planning, and operational. We will illustrate the framework in the context of the **Seven-Eleven Japan** case.

Read: C&M Chapters 1 – 3, *Seven-Eleven Japan* [Chapter 3 of C&M]

Read: *Seven-Eleven Japan* case.

Respond: To MCQs posted in Quercus regarding this case.

### **Session 2: Designing the Supply Chain Network: Facility Decisions Planning**

We will first discuss relevant issues in designing the supply chain network. We will develop a framework for facility decisions that allow for a multi-plant, multi-warehouse network to supply a large and diverse customer base. Our objective will be to optimally structure the distribution network, considering cost and customer service factors. We will continue the network design discussion by considering various network design optimization models.

Read: C&M Chapters 4-5

Read: **BioPharma Inc.** case at the end of Chapter 6.

Group: For the BioPharma Inc. case.

### **Session 3: Designing the Global Supply Chain Network Under Uncertainty**

We will study the impact of uncertainty on network design decisions. Specifically, we address uncertainty in demand exchange rates on the network design. We will learn how to use *decision trees* in order to design a network under uncertainty.

Read: C&M Chapters 6

Read: **BioPharma Inc.** Case at the end of Chapter 6.

### **Session 4: Sales & Operations Planning (SOP)**

We will address supply chain planning decisions. The supply chain network design decisions define the resources available and tend to stay in place for years. On a more regular basis (monthly or quarterly), management must make decisions regarding the near-term use of these resources. Our goal is to understand the role of planning in the success of a supply chain. We will not cover forecasting methods. (You can read about forecasting methods in chapter 7 of C&M.) Our discussion will focus on aggregate supply planning (concepts, methodologies, and strategies) and the link between supply planning and demand management actions such as promotions.



Read: C&M Chapters 8-9

### **Session 5: Lack of Coordination in a Supply Chain and the Bullwhip Effect**

We explore the significance of information sharing in achieving coordination within supply chains. Our discourse encompasses the effects stemming from insufficient information sharing, the existence of information distortion, extended lead times, and delays in information processing, all culminating in the bullwhip effect within a supply chain. We delve into the driving forces behind this phenomenon and its repercussions across all stages of the supply chain. Additionally, we put forth strategies to counteract the adverse effects of the bullwhip effect at various points within the supply chain. To solidify understanding regarding the negative impact of inadequate information sharing and decision coordination within a supply chain, we play the Beer Distribution Game (BDG) during the first hour of the lecture. In the second hour, I will provide a comprehensive debrief of the BDG, its pedagogical goals, and the associated winning strategy.

Read: C&M Chapter 10

Read: Instructions for the **Beer Distribution Game (BDG)**.

Submit: a paragraph about how you would play the game to achieve the lowest possible cost.

Play during class: BDG. **You will be graded for this game.**

### **Session 6: Coordination and Economies of Scale in a Supply Chain (Cycle Inventory)**

We discuss how the effective management of inventory will ensure fit with stated strategic goals. Our first goal is to understand the buildup of cycle inventory and managerial actions that can improve supply chain performance in this respect. After briefly reviewing the basic EOQ model, we will investigate its application and implications for multi-product, multi-location inventory management. We will then start considering the role and value of pricing incentives in managing cycle inventories, specifically how quantity discounts and trade promotions impact order sizes, inventory levels and cycle times. We will later discuss how lower inventory costs and faster responsiveness can be achieved when different stages of supply chain coordinate their decisions.

Read: C&M Chapter 11

### **Session 7:**

#### **Part (1): Managing Uncertainty in a Supply Chain Safety Inventory (1)**

We will consider how to manage safety inventory to respond to uncertainty, which is the major obstacle to matching supply and demand in a supply chain. Our goal is to discuss strategies that allow a supply chain to provide high availability and variety at reasonable costs.

#### **Part 2: Managing Uncertainty in a Supply Chain Safety Inventory (2): Tailored Pooling**

In this part, we briefly review and then further develop the basic analytics of safety inventory as a basis for the *ALKO* assignment. We will discuss various measures of customer service such as cycle service level and fill rate and will then derive precise relationships between these product availability measures and safety inventory. We will discuss the *ALKO* case to identify the factors that affect the location of inventories within the distribution system. **The case illustrates the inventory, transportation, and facility tradeoffs when designing a supply chain.** We will discuss various business models that rely on this ability to pool uncertainty, including the concepts of postponement and levers for mass customization. A key objective will be to develop an understanding of *how to tailor* safety and cycle inventory locations in a network based on demand and supply characteristics.

Read: C&M Chapter 12

Read: **ALKO** case at the end of Chapter 12.

Submit: a paragraph about how you would play the game to achieve the highest possible profit.

Play: Read instructions of the Newsvendor Game (NVG). Play the offline NVG before the lecture.

**You will be graded for this game.**

### **Session 8: No lecture, online take-home exam**

**Mid-term exam coverage:** The mid-term exam will be released on Tuesday, **Oct. 22<sup>nd</sup>** at **3:00 pm**. The mid-term exam will cover **the first 6 lectures**. Specifically, **Chapters 1-11** (excluding Chapter 7). The due date for submitting your mid-term exam is Friday **Oct. 25<sup>th</sup>** at **11:59 pm**.

### **Session 9: Linking Product Availability to Profits**

We will discuss how a firm determines the optimal level of product availability, particularly for short life-cycle products in markets with significant uncertainty, and how to make these ordering decisions in the presence of capacity constraints. We will first briefly review and then further develop the analytics of the newsvendor model as a basis for decision making. We will have a guest speaker for the last 40 minutes of this lecture.

Read: C&M Chapters 13

### **Session 10: Sourcing and Supply Chain Coordination through Contracts**

Having discussed the logistical drivers, facilities, inventories, and transportation, we will turn to sourcing and supply chain coordination and we will practice contract design and negotiation in the context of the **Uncle Coco's Magic Shop** negotiation game. In this game, each student negotiates individually with another student. We will consider the design of supply chain contracts to share risk and rewards among supply chain partners, as a foundation for the negotiation game *Uncle Coco's Magic Shop* that we will play in session 10.

Read: C&M Chapter 15 (review); *Uncle Coco's Magic Shop: A Negotiation Exercise* [online course pack]

Read: *Uncle Coco's Magic Shop: A Negotiation Exercise* [online course packet]

Practice before class: *Excel file for the game*

### **Session 11: Uncle Coco's Magic Shop, In-class Game Exercise**

Students will play an in-class negotiation game related to Uncle Coco's Magic Shop using the provided excel file. Students must play this game for 25 minutes to find the optimal contract parameters. After playing this game, I will debrief the educational goals associated with playing this negotiation game.

Play during class: ***Uncle Coco's Magic Shop: A Negotiation Exercise***. You will be graded for this game.

Practice before class: Supply Chain Disruption Game (SCDG): <https://games.fathomd.com>

Play during class: Supply Chain Disruption Game (SCDG): You will be graded for this game.

### **Session 12: Sustainability in the Supply Chains**

We will discuss sustainability as a key priority in the design of operation of supply chains in the twenty-first century. A focus on sustainability allows a supply chain to better serve more environmentally conscious customers while often improving supply chain performance. In this lecture, we will explore the importance of sustainability, some challenges to designing and operating more sustainable supply chains, and the role of different supply chain drivers in improving sustainability.

Read: C&M Chapter 17

Read: ***Rubicon Global*** case [online course packet]

**Final-term exam coverage:** The final exam will be in take-home and online. The final exam will cover lectures 6-12 plus chapter 4 of the textbook. Specifically, Chapters 4,12-15, and 17. The final exam is of **3-hour duration** and its exact date is to be announced by ATS and it is between Dec. 6 to Dec 21.

## Guidelines for Full Case Analyses

The reports are graded for both content and presentation. A good paper should start with a clear and succinct statement of recommendations (on the first page) to provide the reader with a framework. (If a lengthy description of the recommendation seems necessary, append it to the report.) The remaining paragraphs should each present a major part of the rationale for the recommendation in terms of the desirable and undesirable consequences of adopting it. The rationale must consider capabilities that the supply chain under study needs to excel at, and how the current system either provides these capabilities or fails to provide them.

Some common problems in preparing reports result from inadequate analysis. Analysis for a report is a time consuming and intellectually challenging task. Each case has a set of questions that are a guide to help you with the analysis. However, do not limit your analysis to narrowly answering these questions. The objective is to evaluate a complete range of alternatives and discuss the full consequences of your recommendation. Students will therefore be evaluated compared to the performance of their peers in each case study.

A good report is not a chronology of analysis, but a clearly articulated statement of recommendations and support. Case facts need not be restated unless used to make a point. If you recommend against certain options under consideration, provide a clear rationale for doing so. I will assume that all alternatives and options left out of the report are not important to you. You must clearly discuss how your recommendations aid in the development of capabilities that are important for the supply chain under study. You should identify and explain desirable and undesirable consequences of your recommendations. In the overall evaluation of your report I place the greatest importance on how well you justify and explain your recommendations.

Per the honor code, an individual should sign the report only if he or she has contributed to the analysis.

### Written Case Analyses: Deadlines, Submission and Format Guidelines

- **Deadline:** Written case analyses are due at 11:59 pm on the day specified as due date (unless otherwise stated). **Late assignments are not acceptable - no credit will be given.** For exceptional circumstances see “Course Work & Academic Honesty.”
- **Submission:** Submit your report in the designated page in Quercus before the deadline.
- **Format & length:** About 3 to 4 pages (typed, one-half-spaced, 11pt font size), not including appendices and exhibits. Recommendations should be summarized on 1 page. Each recommendation should be supported by a crystal-clear discussion of how it follows from your analysis.
- **Exhibits:** Must be neat and easy to understand. Excel spreadsheets should be self-explanatory and consistent with any references in the main text. Structure spreadsheets so that I can easily track how the aggregate performance (e.g., profit) of a decision alternative follows from intermediate calculations (e.g., supply chain actions, cost, and revenue drivers.)
- **Grading:** I will take the perspective of a consulting client and evaluate how well your report measures up against these 3 questions: 1) Did you ask all the relevant questions?, 2) Do your answers to these questions adequately account for the relevant data, information and tradeoffs?, and 3) Do you make it crystal clear how you reach your answers, i.e., is the link clear from data to analysis to recommendations?

## 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

- 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>
- Request for Special Consideration Form: <https://rotmancommerce.utoronto.ca/current-students/forms-requests-and-appeals/forms/>
- ACORN: <http://www.acorn.utoronto.ca/>
- Email Accessibility Services: [accessibility.services@utoronto.ca](mailto: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/>