

## Course Outline

<b>Course Code</b>	RSM 370 H1 F
<b>Course Name</b>	Supply Chain Management
<b>Term, Year</b>	Fall, 2022
<b>Course Meets</b>	Monday 11:00-1:00 – WO 25
<b>Web page URL</b>	<a href="https://q.utoronto.ca/courses/280823">https://q.utoronto.ca/courses/280823</a>

### Instructor Details

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<b>TAs</b>	<ul style="list-style-type: none"> <li>▪ Ranon Ng (He/his): <a href="mailto:ranon.ng@mail.utoronto.ca">ranon.ng@mail.utoronto.ca</a></li> <li>▪ Lucy Zhu (She/her): <a href="mailto:Lucylu.zhu@mail.utoronto.ca">Lucylu.zhu@mail.utoronto.ca</a></li> </ul>

- 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. I will let you know which TA is going to grade each deliverable so you can reach out to him/her for grade disputes or clarification.

## 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 Corequisites

The corequisite for the course RSM 370 is **RSM 270: Operations Management and the completion of 9.0 credits.** However, it is strongly recommended that RSM270H be taken before and not concurrent with RSM370H as most techniques that students use to analyze supply chain problems are based on theories and techniques that they have learned in the RSM 270. We extend the scope of these techniques beyond the operations of a single stage (supplier, manufacturer, distributor, wholesaler, or retailer) of a supply chain to those of all stages of a supply chain.

## 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/coursepack-sharing?coursepackId=a1R5c00000E8rXLEAZ>
- **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 **60.50 CAD: 10.56 CAD (cases) and 49.99CAD (e-text)**. 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	10%	Ongoing
Assignments (1 assignment)	10%	September. 30 <sup>th</sup>
Case Write Up (three cases, 10% each)	20%	Oct. 9 <sup>th</sup> and Oct. 30 <sup>th</sup>
Mid-Term Test	25%	Oct. 21 <sup>st</sup> to 23 <sup>rd</sup> , <b>Take-home</b>
Final Term Test	35%	TBD, <b>Take-home</b>

## 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 spend **4-7 hours** for solving the single assignment for this course. Do not postpone solving this assignment to a day before the due date in which case, you will probably find the assignment difficult to solve. Take the following steps to succeed in solving the assignment:
  - Attend the second lecture that is related to the spreadsheet model development for Network Design problems.
  - Watch the video/detailed spreadsheet model that I have prepared for the Network Design problems, posted on Quercus.
  - Quickly read all the questions of the assignment and try to solve them one at a time in each day. In case you encounter any difficulty solving any part of the assignment, reach out to me for help.
- Expect to spend around **7-10 hours** on each of the written case analyses. These are just guidelines – it may take you more or less time.
  - Case study 1 is completely related to assignment 1. Your performance on assignment 1 will determine how much you can contribute to case study 1. As such, the best decision is to spend good amount of time mastering assignment 1 so you can be an effective team member.
- Reading and analyzing cases help students develop a deeper understanding of the subject matter. The mid-term and final exams might include some questions from these cases.
- If you follow along with lectures precisely, preparing for the midterm/final exams should take little time.

**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 Newsvendor and the negotiation games. 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. 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 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*.

**Offline newsvendor game.** You are going to play this game before the start of the 6<sup>th</sup> lecture. The newsvendor game puts students in shoes of a bagel shop manager who needs to decide how many bagels to order for the next day. This game allows students to learn how to capture the too little versus too much tradeoff using the theories associated with the Newsvendor model.

**In-class negotiation game.** We are going to play a negotiation game in class that mimics a real-world negotiation process that occurs between a Manufacturer and a Retailer. The Manufacturer aspires to charge higher prices to the retailer to maximize its profit; greedy pricing decisions by the manufacturer will negatively impact the order quantity that will be requested by its retailer and hence reduces the profitability of the manufacturer. The retailer, on the other hand, has more accurate information about demand, which helps bargain for a better price. ***The parties will be involved in a negotiation process to find the right price and order quantity.***

- **Excel file:** Students will be given an excel file for different contracts, including wholesale, buyback, revenue-sharing, and profit-sharing that they have learned in the sourcing lecture. The goal of playing with such an excel file is that students learn how to find optimal contract parameters that maximize a supply chain surplus.
- **In-class game exercise:** During the in-class game exercise, each student is randomly assigned to the role of a manufacturer or a retailer. I will pair each manufacturer with a retailer. Each pair of manufacturer/retailer will be sent to different study rooms and they must come back with a signed contract stating parameters of the contracts. If students fail to come up with a mutually agreed upon contract, the parameter values of the benchmark contracts are considered for them.

**Case discussions.** Another way that students can obtain class participation points is to participate in discussions related to cases **Seven Eleven Japan** (first lecture) and **Rubicon Global** (last lecture).

**Assignment** (Individual, 10%). This course will have only one assignment. This assignment enables you to develop spreadsheet models for supply chains' network design problems. Once you are done with this assignment, you need to undertake a bigger challenge of solving the case study 1 that builds on your knowledge that you have developed on this assignment.

**Case analyses** (group, 20%). There are two 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 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 strongly advise each group member to actively work on every part of the group assignment. Otherwise, I find that students only come to understand the part of the course dealing with assignments they worked on, and do not learn the other parts. *I strongly advise that each group member reviews the (submitted) report and provides his/her teammates with constructive feedback so the quality of the final submission increases. Also this practice helps all members be aware of what contents other team members have included in the report.*

**Mid-term exam** (individual, 25%). The mid-term exam will be a **take-home, online, and open book** that covers **the first five lectures** of the course (**Chapters 1-11**, Chapter 7 excluded). The exam has two parts: (i) MCQ and (ii) descriptive/numerical. The MCQ part of the mid-term exam must be finished within 60 minutes after you click on it. For the descriptive/numerical part of the exam, students will be given at least 48 hours to complete the exam, depending on the questions that will be included in the exam. Students will be required to upload their responses (either a doc or pdf file) into Quercus before the designated deadline. **No grade will be considered for late submissions.**

The exam 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. ***The main objective for choosing a take-home exam is for you to review and synthesize all the course concepts that you have learned and not only to test your abilities to respond to questions under time pressure.*** It will test your understanding of the main concepts, not your ability to memorize information.

**Final assessment** (individual, 35%). 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 (including mid-term and final-term assessments)

Students who miss a test or assignment for reasons entirely beyond their control (e.g., illness) may request special consideration.

In such cases, students must:

1. Notify the instructor AND the Rotman Commerce Program Office **on the date** of the missed course deliverable, e.g. missed test, final assessments, assignment or class (in the case of participation marks).
2. Complete a [Request for Special Consideration Form](#) and submit it along with your Absence Declaration on [ACORN](#) (please read the instructions on how to use the Absence Declaration in ACORN) within **2 business days** of the originally scheduled course deliverable.

Students who do not provide this information will be given a grade of 0 (zero) for the missed course deliverable.

*A make-up test will be arranged for those students who have missed the mid-term and final exam due to plausible and approved reasons.*

### **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.

### **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.

### **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.

## 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

	Session	Topics & Required Readings	Submit/due-date
Mid-term coverage	<u>1</u> Sep. 12	<b>Framework: Supply Chain Design, Planning &amp; Operation</b> C&M 1 – 3; <i>Seven-Eleven Japan (mini case)</i>	
	<u>2</u> Sep. 19	<b>Designing the Supply Chain Network: Facility Decisions</b> C&M 4 - 5; Network Design Under <i>Deterministic</i> Demand	<b>Bio Pharma, Inc.</b> , Finalize groups by Sep. 19 <sup>th</sup>
	<u>3</u> Sep. 26	C&M 6; Global Network Design Under <i>Stochastic</i> Factors	<b>Assignment 1, Sep. 30, 11:59 pm</b>
	<u>4</u> Oct. 3	<b>Planning Demand and Supply in a Supply Chain</b> C&M 8 - 9; Sales & Operations (S&OP) Planning	<b>Bio Pharma report</b> , Oct. 9 <sup>th</sup> , 11:59 pm
	<b>No Lec.</b> Oct. 10	Thanksgiving	<b>ALKO</b> , Finalize groups by Oct. 10 <sup>th</sup>
	<u>5</u> Oct. 17	<b>Coordination &amp; Managing Inventories</b> C&M 10-11; Coordination and Economies of Scale in a Supply Chain (Cycle Inventory);	
	<b>Mid-term Exam</b>	<b>Take-home online mid-term exam: the exam covers the first five lectures: Chapters 1-11, excluding chapter 7.</b>	From 9 am on Oct. 21 <sup>st</sup> to 11:59 pm on Oct. 23 <sup>rd</sup>
Final exam coverage	<u>6</u> Oct. 24	<b>Managing Safety Inventories</b> C&M 12; Managing Uncertainty in a Supply Chain: <b>Safety Stock 1</b>	<b>News vendor Game</b> by 11:59 pm, Oct. 23 <sup>rd</sup>
	<u>7</u> Oct. 31	C&M 12; Managing Uncertainty in a Supply Chain: <b>Safety Stock 2</b>	<b>ALKO report</b> , Oct. 30 <sup>th</sup> . 11:59 pm
	<b>No Lec.</b> Nov. 7	Study Week	
	<u>8</u> Nov. 14	C&M 13; Linking Product Availability To Profits	
	<u>9</u> Nov. 21	<b>Sourcing and Supply Chain Coordination</b>	
		<b>Cost Optimization Through Multi-Tiered Inventory Storage</b> Supply Chain Coordination through Contracts; C&M 15	Guest speaker*
	<u>10</u> Nov. 28	<b>Exercising the Uncle Coco's Magic Shop game in class</b>	An Excel file will be provided for the game.
	<u>11</u> Dec. 5	<b>Managing Transportation: C&amp;M 14</b>	
	<u>12</u> Dec. 8	<b>Sustainability and the Supply Chain: C&amp;M 17</b>	<b>Rubicon Global</b>
	<b>Final Test</b>	<b>Take-home/online final exam; Chapters 4; 12-15, and 17</b>	TBA, Between Dec. 10 <sup>th</sup> to Dec. 20 <sup>th</sup>

\*This date is tentative and may be subject to change. You'll be informed of such a change at least one week ahead of time.



Please note that the last day you can drop this course without academic penalty is **November 16, 2022**.

### **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 mini case* (questions at the end of the 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

### **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: Aggregate and Sales & Operations (SOP) Planning**

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: 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 Chapters 10-11

**Mid-term exam coverage:** The mid-term exam will be released on Friday, Oct. 21<sup>st</sup> at 9:00 am. The mid-term exam will cover **the first 5 lectures**. Specifically, Chapters 1-11 (excluding Chapter 7). The due date for submitting your mid-term exam is Sunday Oct. 23<sup>rd</sup> at 11:59 pm.

### **Session 6: 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.

Read: C&M Chapter 12

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

### **Session 7: Managing Uncertainty in a Supply Chain Safety Inventory (2): Tailored Pooling**

In this session, we will first 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 (continuation of Chapter 12)

### **Session 8: 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.

Read: C&M Chapters 13

Read: Read the case of **Ventilator Stockpiling Decisions**. This case will be posted in Querqus.

### **Session 9: 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*

Prepare: *Excel file for the game*

### **Session 10: 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 30 minutes to find the optimal contract parameters. After playing this game, I will debrief the educational goals associated with playing this negotiation game.

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

### **Session 11: Managing Transportation**

We will discuss how to match supply and demand, considering how to allocate speculative and reactive capacity to different products and suppliers. This will introduce the notion of tailoring sourcing decisions based on product demand uncertainty and supplier capabilities. We will then turn our focus to transportation decisions. We will briefly look at the main transportation modes and then investigate the link between transportation and inventory costs in the design of transportation networks.

Read: C&M Chapter 14

### **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. 10 to Dec 20.

### **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. **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, double-spaced, max. 12pt 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/>