GSCM 510:

Data Science for Supply Chain Excellence

School of Business and Management

3 Credits
Effective Date 1/1/2023
List any Pre-requisite or Co-Requisite: None

Access to the Internet is required.
All written assignments must be in Microsoft-Word-compatible formats.
See the library's APA Style Guide tutorial for a list of resources that can help you use APA style.

Faculty Information

Professional experience information for instructors is found under *Syllabus, Schedule, and Course Team* in the online course menu.

Contact Information

Contact information for instructors is found under *Syllabus, Schedule, and Course Team* in the online course menu.

Course Description

This course explores the application of data analytics to effectively assess and improve the supply chain processes including strategy, design, execution, and people. Students learn to evaluate the effectiveness of supply chain processes using data and analytical techniques to measure the quality-of-service delivery, decrease short order lead-times, improve ease of adapting to changing market and customer demands, increase efficiency of inventory management, and reduce operating costs. Mastery of relevant concepts enables students to assess organizational processes using supply chain data, establish and evaluate metrics for supply chain solutions, and provide compelling evidence to stakeholders to facilitate decision-making.

Course Resources

Robertson, P. W. (2020). *Supply Chain Analytics: Using Data to Optimise Supply Chain Processes.* United Kingdom: Taylor & Francis.

Required and recommended resources to complete coursework and assignments are found on the course Reading List. Access is provided through the *Reading List* link in your online course as well as from the library homepage ("Find Your Reading List" button).

Note: Required resources that must be purchased by the student are tagged "Purchase from a vendor of your choosing." Required resources with a direct link, "Available through CityU Library", are available electronically at no cost to students.

Students in Canada may purchase course resources from the Canada Bookstore, and students outside the U.S. and Canada should contact their advisor or textbook coordinator for additional information.

Course Outcomes

This course will prepare students to:

CO.1: Analyze supply chain data using a variety of descriptive, predictive, and/or prescriptive analytics techniques. **(Case Study Presentations and Final Project)**

CO.2: Assess supply chain strategy, design, execution, and people processes against the supply chain framework using the SCOR model. **(Final Project)**

CO.3: Justify the results of supply chain analytics analyses to stakeholders to effect organizational change. **(Case Study Presentations)**

CO.4: Generate data-driven recommendations to improve supply chain process metrics, such as lead time, customer satisfaction, safety, and queuing time. **(Case Study Presentations and Final Project)**

Additional Information

This is a new heading for our syllabus template. Programs are using this to list additional information required by accreditors, or core concepts/knowledge/skills.

Grading Scale

The grades earned for the course will be calculated using City University of Seattle's decimal grading system, found in the current University Catalog (https://www.cityu.edu/catalog/).

Grading rubrics with details on how each assignment will be graded are located under *Assignments* and/or in *My Grades* in the online course menu. Students should review the rubric for each assignment prior to completing their work in order to understand how it will be assessed.

Course Assignments and Grading

Overview of Required Assignments	*% of Final Grade*
Case Study Presentations (2)	40%
Final Project Milestones (2)	10%

Final Project	30%
Instructor Determined Assignments and Activities	20%
TOTAL	**100%**

Case Study Presentations (40% of Final Grade)

CO.1: Analyze supply chain data using a variety of descriptive, predictive, and/or prescriptive analytics techniques. **(Case Study Presentations and Final Project)**

CO.3: Justify the results of supply chain analytics analyses to stakeholders to effect organizational change. **(Case Study Presentations)**

CO.4: Generate data-driven recommendations to improve supply chain process metrics, such as lead time, customer satisfaction, safety, and queuing time. **(Case Study Presentations and Final Project)**

Instructors will assign two case studies for students to analyze. These assignments assess students' ability to sample, analyze, and interpret supply chain data to improve supply chain metrics. Specific techniques assessed may include economic analysis, queuing, forecasting, segmentation and clustering, and regression. The assignments will include analysis of supply chain data using Microsoft Excel, an interpretation of the data, and recommendations for improvement of supply chain metrics. Students present findings tailored to the appropriate stakeholders.

Components	*% of Grade*	
Analysis	20%	
Interpretation	30%	
Recommendations		20%
Presentation	30%	
TOTAL	**100%**	

	% of Grade	Below Standard	Approaching Standard	At Standard	Exceeds Standard

Analysis (CO.1)	20	Analysis may be inappropriate, inaccurate, or incomplete as per assignment instructions or analysis is missing.	Analysis is mostly appropriate and accurate but may be incomplete as per assignment instructions. Labeling of data may be confusing or inaccurate.	Analysis is appropriate, mostly accurate and comprehensive as per assignment instructions. Data is clearly and accurately labeled.	Analysis is appropriate, accurate, and comprehensive as per assignment instructions. Data is clearly and accurately labeled.
Interpretation (CO.3)	30	Interpretation of the analysis is incomplete, inaccurate, and unclear or the interpretation of the analysis is missing.	Interpretation of the analysis is oversimplified, inaccurate or unclear. Major details are missing that would help the reader understand the analysis according to the assignment instructions.	Interpretation of analysis is complete and accurate. Minor details are missing that would help the reader understand the analysis according to assignment instructions.	Interpretation of analysis is comprehensive, accurate, and detailed, explaining the connections between the analysis and applicability of the data according to assignment instructions.
Recommendations (CO.4)	30	Generates a limited action plan of final recommendations that is not fully informed by relevant analysis. Proposed recommendations for implementation may be lacking clear rationale.	Generates some recommendations, but connections to the internal/external analyses or use of appropriate tools are somewhat unclear; Recommendations for implementation have some rationale.	Generates multiple recommendations, each mostly informed by the internal/external analyses and use of appropriate tools; Recommendations for implementation have a somewhat strong and persuasive rationale.	Generates multiple recommendations, each clearly informed by the internal/external analyses and use of appropriate tools; Recommendations for implementation have a strong and persuasive rationale.

Presentation	30	Presentation of the analysis is difficult to follow, lacks important details. Visuals are absent or confusing to the audience or presentation is missing. Messages are articulated verbally, but language and time in inconsistent, stilted, and/or student is simply reading the slides or script.	Presentation of the analysis is disjointed or confusing and missing important details. Visuals may be inappropriately used or inaccurate. Messages are articulated verbally, but with inconsistencies in terms of pacing and/or projecting.	Presentation of the analysis explains the story the data are telling but may be missing details and/or clear visuals that allow the audience to understand the analysis. Narration is generally well-articulated, well-paced, and appropriately projected.	Presentation of the analysis clearly explains the story the data are telling, provides important details, and contains compelling visuals that allow the audience to completely understand the analysis. Narration is clear, well-articulated, well-paced, and appropriately projected.
TOTAL	100%				

Final Project (30% of Final Grade)

CO.1: Analyze supply chain data using a variety of descriptive, predictive, and/or prescriptive analytics techniques. **(Final Project and Case Study Presentations)**

CO.2: Assess supply chain strategy, design, execution, and people processes against the supply chain framework using the SCOR model. **(Final Project)**

CO.4: Generate data driven recommendations to improve supply chain process metrics, such as lead time, customer satisfaction, safety, and queuing time. **(Case Study Presentations and Final Project)**

For the final project, students will research a problem in the supply chain industry that can be addressed using supply chain analytics, analyze the data, and make recommendations based on the analysis of problem based on their study. The option(s) or the case and a template for the final submission will be provided by the instructor.

The purpose of this assignment is to evaluate a supply chain analytics problem using the Supply Chain Operations Reference (SCOR) model or other alternatives. This course focuses on choosing the appropriate SCOR metrics for a supply chain organization to optimize business performance. Students will highlight a minimum of two metrics for each component in the SCOR

model. Students will then practice utilizing a variety of data analytical tools and techniques to measure each area in the SCOR model. Next, the students will explain the data and develop conclusions from the data. The students will make recommendations based on their analysis.

Students will utilize the case materials to evaluate the six SCOR model areas:

- **Plan**: Resource allocation, requirements development, and communication plan
- **Source**: Assessing market demand and purchasing
- **Make**: Manufacturing, equipment, and facilities
- **Deliver**: Order, transportation, and distribution management
- **Return**: Post-delivery returns, and customer support
- **Enable**: Business rules, performance, compliance, and risk management

Complete the final report of findings and make proper recommendations. Incorporate all suggested revisions and corrections from previous checkpoints.

The final paper will be 5-7 pages (excluding cover page and reference page); APA writing conventions should be followed with a minimum of 5 sources referenced and cited. Students must familiarize themselves with the meaning of plagiarism and the University's policies on academic dishonesty.

Components	*% of Grade*
Data Analysis and Analytical Tools	25%
Interpretation	25%
Recommendations	35%
Writing Quality and Format	15%
TOTAL	**100%**

	% of Grade	Below Standard	Approaching Standard	At Standard	Exceeds Standard

Data Analysis and Analytical Tools (CO.1)	25	Analysis may be inappropriate, inaccurate, or incomplete. Data analysis tools are used inappropriately or inaccurately OR data analysis tools are not used at all.	Analysis is mostly appropriate and accurate but may be incomplete. A limited number of commonly used data analysis tools are utilized to appropriately assess data problems and challenges accurately.	Analysis is appropriate, mostly accurate and comprehensive. A variety of appropriate analytical tools are utilized to appropriately assess data problems and challenges accurately.	Data analysis is appropriate, accurate, and comprehensive A variety of appropriate analytical tools are utilized to assess data problems and challenges accurately. Expanded use of tools exhibits innovation and agility when conducting the data analysis.
Interpretation (CO.2)	25	Incorrectly explains data presented and/or draws incorrect inferences or conclusions.	Partially explains data presented with some inferences and conclusions.	Accurately explains data presented with appropriate inferences and conclusions.	Accurately explains data presented with nuanced inferences and conclusions.
Recommendations (CO.4) (PO.4)	35	Generates a limited action plan of final recommendations that is not fully informed by relevant analysis. Proposed recommendations for implementation may be lacking clear rationale.	Generates some recommendations, but connections to the internal/external analyses or use of appropriate tools are somewhat unclear; Recommendations for implementation have some rationale.	Generates multiple recommendations, each mostly informed by the internal/external analyses and use of appropriate tools; Recommendations for implementation have a somewhat strong and persuasive rationale.	Generates recommendations, each clearly informed by the internal/external analyses and use of appropriate tools; Recommendations for implementation have a strong and persuasive rationale.

| Writing Quality and Format | 15 | Frequent problems with organization, clarity and/or conventions make the paper hard to read.

APA conventions are not followed. | Numerous mechanical errors are distracting; and organization of ideas are lacking, but not enough to interfere with meaning.

APA conventions are only sometimes followed. | There are few problems with organization, clarity or conventions that should have been fixed.

APA conventions are consistently followed. | The writing clearly communicates the message(s) with a high degree of fluency throughout; near mastery of writing organization and writing conventions. There are minimal problems with spelling, punctuation, and grammar.

APA conventions are strictly followed. |
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| TOTAL | 100% | | | | |

Final Project Milestones (10% of Final Grade)

Students submit portions of their final project for the instructor to review. Instructors provide feedback for clarification and improvement on the final project. There are two milestones during the course:

- **Milestone 1 (due at end of module 3):** Sample selected data and perform initial analysis. The goal of this checkpoint is to become familiar with the data and establish the initial SCOR framework. Students will perform an initial review of the company's financial statements.

- **Milestone 2 (due at end of module 7):** Establish initial metrics and methodologies for assessing each SCOR category. The goal of this checkpoint is to ensure that students make continual progress toward their completed final project.

Components	*% of Grade*
Milestone Content	85%
Writing Quality and Format	15%
TOTAL	**100%**

	% of Grade	Below Standard	Approaching Standard	At Standard	Exceeds Standard
Milestone Content	85	Content submitted does not address the majority of milestone instructions.	Content submitted somewhat addresses milestone instructions.	Content submitted mostly addresses milestone instructions.	Content submitted fully addresses milestone instructions.
Writing Quality and Format	15	Frequent problems with organization, clarity and/or conventions make the paper hard to read. APA conventions are not followed.	Numerous mechanical errors are distracting; and organization of ideas are lacking, but not enough to interfere with meaning. APA conventions are only sometimes followed.	There are few problems with organization, clarity or conventions that should have been fixed. APA conventions are consistently followed.	The writing clearly communicates the message(s) with a high degree of fluency throughout; near mastery of writing organization and writing conventions. There are minimal problems with spelling, punctuation, and grammar. APA conventions are strictly followed.
TOTAL	100%				

Instructor Determined Assignments and Activities (20% of Final Grade)

The instructor will determine a set of activities that support the course outcomes and major assignments of the class. These activities could include collaboration, discussion, participation, peer-review, learning reflections, learning checks or other activities online or in-class. Descriptions are provided by the instructor in the course.

Components:	*% of Grade*
Quality of Responses	50%
Quantity of Responses	30%
Timeliness	20%
TOTAL	**100%**

	% of Grade	Below Standard	Approaching Standard	At Standard	Exceeds Standard
Quality of Responses	50	Superficial, undeveloped and unsupported analysis that lacks insight or thoughtfulness. Never addresses instructor's comments to original posts; no connections are made to previous and current sessions' concepts and materials. No references to readings. Obvious grammatical or stylistic errors, making understanding difficult.	Scattered and poorly developed analysis rarely supported by academically appropriate resources. Sometimes addresses instructor's comments to original posts; offers few new ideas or connections made to previous and current sessions' concepts and materials. Mostly anecdotal examples with no references to readings; may rephrase or summarize other postings.	Generally competent analysis, supported by various academically appropriate resources. Usually addresses instructor's comments to original posts; offers some new ideas or connections to previous and current sessions' concepts and materials. References readings provided by instructor. Grammatical or stylistic errors do not interfere with content.	Rich, thoughtful and insightful problem analysis well supported by various academically appropriate resources. Always addresses instructor's comments to original posts; offers detailed new ideas and connections to previous sessions' concepts and/or real-life situations. References materials beyond those provided by instructor. Almost entirely free of grammatical or stylistic errors.
Quantity of Responses	30	Some, or all, required quality posts missing.	Initial post and fewer than minimum number of	Required minimum number of quality posts.	Exceeds minimum number of required quality posts.

		required quality posts.		
Timeliness of Responses	20	All posts submitted at the last minute without allowing for response time.	Posts submitted on fewer than three days of the discussion time.	Posts submitted on three different days of the discussion time.	Posts submitted on more than three days of the discussion time.
TOTAL	100 %			

Course Policies

Late Assignments

A critical aspect of management is to meet predefined deadlines. Therefore, all assignments are expected to be submitted when due. No late assignments are accepted. Life-situations do occur. When an issue arises, coordinate with the instructor prior to the assignment's due date and the due date may be adjusted. It is in the best interest of the student to ensure that all assignments are submitted on time.

Participation

Class participation will be evaluated during class. Participation includes being prepared for class discussions and contributing meaningful content when appropriate. It also includes individual effort contributed to the team project.

Professional Writing

Assignments require error-free writing that uses standard English conventions and logical flow of organization to address topics clearly, completely, and concisely. CityU requires the use of APA style.

University Policies

Students are responsible for understanding and adhering to all of City University of Seattle's academic policies. The most current versions of these policies can be found in the University Catalog that is linked from the CityU Web site.

Antidiscrimination

City University of Seattle and its staff and faculty are committed to supporting our students. We value equity, diversity, and inclusion as a way of life as well as the educational opportunities it provides. City U will not tolerate any form of discrimination based on race, color, ethnicity, sexual orientation, gender identification, socioeconomic status, or religious values. If you have experienced any discrimination based on any of the above, we encourage you to report this to the University. Please report this to your instructor. If you do not feel safe reporting this to your instructor, please report to the Provost or to the Vice President of Student Affairs.

Non-Discrimination & Prohibition of Sexual Harassment

City University of Seattle adheres to all federal, state, and local civil rights laws prohibiting discrimination in employment and education. The University is committed to ensuring that the education environment is bounded by standards of mutual respect and safety and is free from discriminatory practices.

In the U.S., the University is required by Title IX of the Education Amendments of 1972 to ensure that all of its education programs and activities do not discriminate on the basis of sex/gender. Sex include sex, sex stereotypes, gender identity, gender expression, sexual orientation, and pregnancy or parenting status. Sexual harassment, sexual assault, dating and domestic violence, and stalking are forms of sex discrimination, which are prohibited under Title IX and by City University of Seattle policy. City University of Seattle also prohibits retaliation against any person opposing discrimination or participating in any discrimination investigation or complaint process internal or external to the institution. Questions regarding Title IX, including its application and/or concerns about noncompliance, should be directed to the Title IX Coordinator. For a complete copy of the policy or for more information, visit https://my.cityu.edu/titleix or contact the Title IX Coordinator.

In Canada, in compliance with the British Columbia Human Rights Code, the Alberta Human Rights Act, WorksafeBC, and the Workers' Compensation Board of Alberta, the University believes that its environment should at all times be supportive and respectful of the dignity and self-esteem of individuals. Discrimination, harassment and bullying conduct, whether through person to person behaviour or via electronic communications such as email or social media is not acceptable and will not be tolerated. As an educational institution, it is our responsibility to cultivate an environment of excellence, equity, mutual respect and to recognize the value and potential of every individual. The University will take all necessary steps to meet or exceed the requirements of the law to prevent discrimination, harassment and bullying. The Respectful Workplace Policy and Procedure for the prevention of discrimination, harassment and bullying can be found on the CityU in Canada website.

Religious Accommodations

City University of Seattle has a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The

University's policy, including more information about how to request an accommodation, is available in the University Catalog and on the my.cityu.edu student portal. Accommodations must be requested by the 20% mark of this course (e.g. day 14 of a ten-week course, day 7 of a 5-week course) using the Religious Accommodations Request Form found on the student dashboard in the my.cityu.edu student portal.

Academic Integrity

Academic integrity in students requires the pursuit of scholarly activity that is free from fraud, deception and unauthorized collaboration with other individuals. Students are responsible for understanding CityU's policy on academic integrity and adhering to its standards in meeting all course requirements. A complete copy of this policy can be found in the [University Catalog](#) under *Student Rights and Responsibilities* on the page titled *Academic Integrity Policy.*

Attendance

Students taking courses in any format at the University are expected to be diligent in their studies and to attend class regularly.

Regular class attendance is important in achieving learning outcomes in the course and may be a valid consideration in determining the final grade. For classes where a physical presence is required, a student has attended if they are present at any time during the class session. For online classes, a student has attended if they have posted or submitted an assignment. A complete copy of this policy can be in the [University Catalog](#) under *Student Rights and Responsibilities* on the page titled *Attendance.*

Final Assignment Due Date

Final assignments for each class at CityU must be due on or before the final date of the course as indicated in the university's course information system. Due dates that extend beyond the final date of the course may negatively impact tuition funding for students.

Support Services

Disability Services Accommodations Statement

Students with a documented disability who wish to request academic accommodations are encouraged to contact Disability Support Services to discuss accommodation requests and eligibility requirements. Please contact Disability Support Services at *disability@cityu.edu* or 206.239.4752 or visit the [Disability Support Services](#) page in the my.cityu.edu portal. Confidentiality will be observed in all inquiries. Once approved, information about academic accommodations will be shared with course instructors.

Library Services

CityU librarians are available to help students find the resources and information they need to succeed in this course. Contact a CityU librarian through the [Ask a Librarian](#) service, or access [library resources and services online](#), 24 hours a day, seven days a week.

Smarthinking Tutoring

CityU students have access to free online tutoring offered through Smarthinking, including writing support, from certified tutors 24 hours a day, seven days a week. Contact CityU's Student Support Center at mycityusupport@cityu.ed to request a user name and password.