

SCM 340-001

**SUPPLY CHAIN ANALYTICS  
FALL 2019  
TENTATIVE SYLLABUS**

**Instructor:** Dr. Varun Gupta

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**Office hours:** MW 330 PM – 530PM, and by appointment

**Course website:** [Canvas](#)

**Class meeting times and locations:** MWF 1115 AM – 1205 PM, Burke 153 (lab)

**Prerequisites:** SCM 301

**Required Course Materials:** 1. (Textbook) *Business Analytics*, 3<sup>rd</sup> edition, Jeffrey D. Camm, James J. Cochran, Michael J. Fry, Jeffrey W. Ohlmann, David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Cengage, 2019.

2. Microsoft Excel (available via PSU) and Tableau (available for free at <https://www.tableau.com/academic/students> and all PSU labs).

**Course Description and Objectives:** Supply Chain Analytics studies key decision areas in supply chain design and operation using data driven methodologies. The course introduces students to strategic, tactical and operational supply chain problems including demand forecasting, risk analysis, revenue management, distribution and facility location. Through this course, application of data visualization and communicating data insights will be discussed. Finally, through the application, analysis, and discussion of data students will learn to obtain useful insights on how to optimize the value of supply chain processes and operations and present these findings in the most relevant way.

By completing this course, students will

- 1) understand classical supply chain problems including demand forecasting, risk analysis, revenue management, distribution and facility location,
- 2) learn how to use supply chain data to identify these supply chain problems,
- 3) acquire skills to utilize statistical software to analyze such supply chain problems,
- 4) work on data set and their application in supply chain problem solving,
- 5) be able to articulate and present the problem and the solution to the audience effectively.

**Grading Policy:** Your final grade will be based on your scores from the exams, in-class and online quizzes, in-class exercises, and clicker activities. The contribution of each item towards your final grade and the cut-off points for letter grades are as follows:

	Points	A	465
Midterm Exam I	80	A-	450
Midterm Exam II	80	B+	435
Final Exam	100	B	410
Online Exercises	120	B-	390
In-Class Case Study Exercises	80	C+	360
Class Participation	40	C	345
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Total Points	500		

In addition to these items, approximately ten Problem Sets will be assigned on the course website with the release/due date information and the solution key. Problem Sets will *not* be part of the final grade so students need not turn in them. However, quizzes will contain materials from these problem sets, and for this reason, students are expected to study them. Some bonus points may also be assigned for completion of assignments based on the Problem Sets.

- 1) *Exams:* There will be two midterm exams and one final exam. All midterm exams will be open-book and open-notes, containing problems based on data sets. You must also bring a calculator to the exams. For the tentative scopes of the midterm exams, see the course schedule at the end of the syllabus.
- 2) *Quizzes:* The quizzes will generally be comprised of short-answer question(s) and may test the recently-taught material in class, including questions from the Problem Sets and topics from the reading assignments. Some of the quizzes will be conducted in class but most will be delivered online. The quizzes will be individual work. I will use quizzes as means of encouraging attendance, *helping you* keep up with the course progress, and as learning tools. I aim to reward your attention in class and help avoid accumulation of topics to study right before the exams.
- 3) *In-Class Case Study Exercises:* There will be about five in-class case study exercises. These exercises are intended to give you an opportunity to practice for the exams; therefore one in-class exercise will be conducted during the *last class meeting before each exam*. You can work in groups to complete the in-class exercises.
- 4) *Class Participation:* Students should attend every lecture. There is incentive and reward for fully preparing for the class, attending, and participating in the class. Participation includes not just attendance but more importantly reading the assigned course materials and preparing for the cases before coming to the class, doing your homework, and actively and constructively participating in class discussions. During discussions quality matters more than quantity. I encourage you to be an active learner.

### **Class Policies:**

- 1) *Office Hours:* You are encouraged to utilize the office hours to discuss your questions or comments. You are also welcome to reach me through email (best way!) and phone.
- 2) *Lectures:* Class sessions will consist of instructor's lecturing, dialogue and discussions, interactive class exercises, classroom games, case discussions, and activities all of which target you to be active learners.
- 3) *Lecture Notes and Handouts:* Lecture notes and handouts will be distributed frequently. They will often include partly-finished learning material. For example, I may introduce problems and discussion questions in the notes, but present the answers during the class sessions. Such additional materials (solutions, answers, etc.) will *not* be posted or distributed, and it is your responsibility to be informed about them. The best way to do this is to be present in class and take your own notes.
- 4) *Course Webpage:* The course webpage will be used to make announcements and post lecture notes, assignments, and other relevant course materials. You are responsible for all the content posted on the webpage. Announcements will be communicated electronically. I encourage you to use the Discussion Forum to post your questions about the course that may be of interest to all students. Posts that include discussions, news, or any information related with the subject matter are also welcome.
- 5) *Missed Exams:* No make-up exam will be given unless you have excuses due to regularly scheduled, University-approved curricular and extracurricular activities and other legitimate but unavoidable reasons. You must notify the instructor via written documentation prior to the exam date, if a prior notification is not possible, as soon as possible. If you miss the final exam due to illness, a doctor's verification is required for a make-up final exam.
- 6) *Missed Quizzes and/or In-class Case Study Exercises:* No make-up quizzes or in-class exercises will be given unless you have excuses due to regularly scheduled, University-approved curricular and extracurricular activities. You must notify the instructor via written documentation prior to the quiz or in-class exercise date.
- 7) *Grades:* If you have any questions regarding your grade received on exams, quizzes, in-class exercises, you must contact the instructor within a week of getting the grade. All grades will be posted online.
- 8) *Disabilities:* Students with disabilities should inform me about their needs as soon as possible.
- 9) *Miscellaneous:* Professional attitude is expected in all communications and during class sessions. Please refrain from any activities including texting, having side conversations, and reading non-course related materials which may jeopardize not only your own learning but also distract your class mates. Please take responsibility in creating a positive learning environment.

**Academic Integrity:** Each student must adhere to the Penn State Erie Academic Integrity principle provided at <http://psbehrend.psu.edu/intranet/faculty-resources/academic-integrity>. This policy will be *strictly enforced*. Violators will receive academic sanctions and may receive disciplinary sanctions, including the awarding of an XF grade. Violations of academic integrity include but are not limited to: Cheating, Copying on a Test, Plagiarism, Acts of Aiding or Abetting, Unauthorized Possession, Submitting Previous Work, Tampering with Work, Ghosting or Misrepresentation, Altering Exams, Computer Theft.

**Course Content and Schedule (subject to change):**

<b>Week/Date</b>	<b>Topic</b>	<b>Text</b>
1) August 26, 28,30	Classical supply chain issues, models and overview of analytics	Chapter 1
2) September 2 September 4, 6	<b>Labor day (no class)</b> Descriptive analytics	Chapter 2
3) September 9, 11, 13	Application of data visualization Case 1: Visualization in supply chains Introduction to Tableau	Chapter 3
4) September 16, 18, 20	Application of Advanced Regression Models and Predictive Analytics	Chapter 7
5) September 23, 25, 27	Time Series Models and Forecasting Case 2: Forecasting in supply chains	Chapter 8
6) September 30, October 2, 4	Review Session <b>Midterm Exam I: October 2</b>	
7) October 7, 9, 11	Probability: An Introduction to Modeling Uncertainty Case 3: Probability in supply chains	Chapter 5
8) October 14, 16, 18	Spreadsheet models	Chapter 10
9) October 21, 23, 25	Supply chain performance measurement SCOR framework	
10) October 28, 30, November 1	Monte Carlo simulations Case 4: Simulation of supply chain	Chapter 11
11) November 4, 6, 8	Review Session <b>Midterm Exam II: November 5</b>	
12) November 11, 13, 15	Introduction to Prescriptive Analytics	
13) November 18, 20, 22	Linear Optimization Models Case 4: Transportation problems	Chapter 12
14) November 25-29	<b>Thanksgiving Break (no classes)</b>	
15) December 2, 4, 6	Integer Linear Optimization Models Case 5: Scheduling problems in supply chain management	Chapter 13
16) December 9, 11, 13	Sensitivity analysis and its application in decision making Catch-up and Review Sessions	
	<b>Final Exam</b> (Exact date/time/venue to be announced)	