

DSB 6200/GSC 7670: MANUFACTURING AND SUPPLY CHAIN ANALYTICS WINTER 2021 (ONLINE COURSE)

INSTRUCTOR:	Sachin Modi.
E-mail:	ge3918@wayne.edu or Sachin.modi@wayne.edu
OFFICE:	Mike Ilitch School of Business Room 275
DELIVERY TYPE:	Online
REMOTE OFFICE HOURS:	By Appointment via Microsoft Teams or Zoom.

COURSE DESCRIPTION AND OBJECTIVES

The purpose of this course is to provide you with skills and knowledge related to manufacturing and supply chain analytics. The focus of the class is twofold. First, an important objective is to learn the analytics concepts that enable managerial decision making. Second, a significant objective is to gain some proficiency on selected tools and techniques while applying them to related operations & supply chain decisions. We will cover the concepts and learn applied skills via readings, online instructional videos, executing hands on tutorials/activities, discussion board, and assessment of learning quizzes.

To obtain the full benefit of the class, it is necessary that you stay on schedule and cover the material by carefully going over the readings, and watching the instructional videos. In doing so, it is critical that you try to develop a comprehensive view of the topics we cover, as well as complete all hands on tutorials where applicable. Please note that this is a technical class that requires you to work with analytics tools. I will aim to cover most of the applications via the use of Microsoft Excel (and related software). The reason I rely on Excel (and associated Plugins) is because it is widely used in industry for day-to-day decision making. Further, it is also easily accessible and adequate to cover the concepts we cover in class. My hope that that on completing this course everyone will develop a strong understanding of the topics covered and gain tangible analytics skills for supply chain decision making.

COURSE LEARNING OUTCOMES

At the completion of the course students should be able to:

1. To understand the distinction between types of business analytics approaches (i.e. descriptive & diagnostic, predictive, and prescriptive), and corresponding tools that are used for these.
2. Learn about concepts related how analytics may be used for decision making in various operations and supply chain related settings
3. Acquire skills for applying the specific business analytics approaches (i.e. descriptive & diagnostic, predictive, and prescriptive) to operations and supply chain related decisions.
4. Learn about data visualization and its uses for managerial decision making

REQUIRED COURSE MATERIALS

1. **DSB 6200/GSC 7670 Book:** *Business Analytics: Data Analysis & Decision Making, 7th Edition, by Albright, S. Christian, and Wayne L. Winston + MindTap.* The Book is available via the bookstore and you have multiple options that you can consider for getting it. Following is some information on that, but please make sure you evaluate your options independently and pick the option that suites your needs best.

- a. If you use Cengage books across multiple courses this semester, the most economical option is to get the Cengage Unlimited card/code ISBN: 9780357700006. Please be sure to find out how long this is valid when you purchase it. If you already have Cengage Unlimited through another course, you should be able to use it for this book as well, as long as your access code is valid for the duration of our course.
- b. There are various formats available through the bookstore, e.g. loose leaf version + MindTap (ISBN: 9780357195925), etc. Please take a look and choose an option that suits your needs best.

2. DSB 6200/GSC 7670 Related Software: The following software will be used in class.

- a. **MS EXCEL:** The base software we use across all modules will be Microsoft Excel. I assume that everyone has excel 2016 installed along with standard Add-ins that come with Excel. All class examples are with Excel 2016 (or later).
- b. **EXCEL ADD-INS:** We will use various add-ins throughout the class. These include built-in standard Excel Add-ins (e.g. Solver, Analysis ToolPack, etc.) and customized Add-ins (e.g. SolverTable, DADM_Tools etc.). Instructions on how you can download these will be provided on canvas.
- c. **PALISADE DECISION TOOLS:** This software is available with the book. Please see the canvas site for more information/instructions on obtaining and installing this. We will be using this on an as-needed basis.
- d. **TABLEAU:** We will cover visualization via Tableau. I have procured a Tableau license key via the Tableau Learning Program for you. This key will work for this course for one Tableau installation per student. Instructions on access for the material and the Tableau license key will be provided via Canvas.

3. DSB 6200/GSC 7670 Articles and Other Materials: Articles and other material will be assigned for readings as needed. Information on these will be provided via Canvas as needed.

IMPORTANT NOTE REGARDING THE COURSE

Please do not miss the deadlines/due dates for any of the deliverables. All the material will be posted and available at least one week before the deadline/due date. You also have the flexibility of completing the work before the deadline. Given that this is a Master's level class; the expectation is that you are able to manage your time commitments to this class per the schedule.

1. Please do not miss the deadlines/due dates for the quizzes. The quiz will be made available at the beginning of the week in which it is due. You can take it anytime during the week. The deadline is at the end of the week (Saturday night). Because of this incredible flexibility, make up quizzes will not be offered.

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2. Passing withdrawal will be approved through the return of the first Quiz regardless of performance-to-date. After this date, a passing withdrawal will be issued only if the student is achieving a passing grade.
3. Discussion boards will also be available in the beginning of the week and are due at the end of the week (Saturday night). Any responses submitted late will be penalized 25% per overdue 12-hour period [100 % straight line penalty for being late over a 48-hour period], beginning at the due date-time for the discussion.
4. No extra credit assignments are possible

GRADING

Grading Scale: [95-100 A], [90-94.9 A-], [88-89.9 B+], [82-87.9 B], [80-81.9 B-], [78-79.9 C+], [72-77.9 C], [70-71.9 C-], [68-69.9 D+], [62-67.9 D], [60-61.9 D-], [0-59.9 F]

Grading Criteria:

Grading areas	Points
Discussion Boards (7 @ 5 points each)	35
Quizzes (1 @ 10 points; and 2 @ 20 points)	50
Tableau Assignment	15
Total	100%

ALL DUE DATES ARE ON SATURDAY THE WEEK OF THE MODULE AT 11:59 PM

Discussion Boards (35 points: 7 discussions @ 5 points each [4 points for your post and 1 point for replying to someone else's post])

There are seven discussion boards that you are expected to engage in. By participating actively in the online discussions, you will sharpen your own insights, and contribute to the learning environment of others. To earn full points, you must post your initial response, as well as reply to at least one other post by your classmates. Discussion boards submitted late will be penalized 25% per overdue 12-hour period [100 % straight line penalty for being late over a 48-hour period], beginning at the due time for the discussion.

Assessment of Learning Quizzes (50 points: 1 @ 10 points; and 2 @ 20 points)

There are three quizzes that are needed to complete the course. Given the online nature of our course this semester, assessment of learning quizzes serve as the primary vehicle of assessment. These are aimed at assessing your grasp of concepts covered in the readings/lectures as well as implementation skills for the problems covered in excel. **All quizzes are timed and you have one attempt per quiz.** The quiz will be available at the beginning of the week it is due in. The due date for the quiz will be Saturday night for that week. **Late submissions will result in a grade of zero. There are no makeup quizzes or extra credit possible.** You do NOT need lockdown browser for the quiz.

Visualization Assignment (15 points: 1 @ 15 points)

There is only one assignment submission. This is for the Tableau Visualization. Instructions on the assignment and its submission will be provided via Canvas.

GENERAL POLICIES

POLICY ON WITHDRAWAL

Students must **drop** classes via the Web by logging into Academica. If a student has a hold and needs help dropping a class then they should send an e-mail request from their WSU e-mail account to registration@wayne.edu with the appropriate course information. Students should check the registration website for the last date to drop classes. Classes that are dropped do not appear on the transcript.

Students who withdraw from a course after the deadline to drop classes will receive a grade of WP, WF, or WN.

- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Academica. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved.

Please review the university's Withdrawal Policy at:

<https://wayne.edu/students/register/dropping/>

RELIGIOUS OBSERVANCE POLICY

Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual.

Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements as suitable as possible may be worked out.

ACADEMIC DISHONESTY

Academic dishonesty will not be tolerated in any form. Academic dishonesty includes, but is **NOT** limited to: cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized prior possession of examinations, submitting work of another person or work previously used without informing the instructor and securing written approval, or tampering with the academic work of other students. It is simple: don't cheat.

All acts of academic dishonesty including cheating and plagiarism will be viewed as violations of appropriate student conduct and they will be dealt with following student due process policies in effect. Disciplinary actions will be taken as warranted. An act of academic dishonesty in this course will automatically result in a grade of F on the test or assignment at issue, and possibly for the course itself. Please, give credit where credit is due, specifically and consistently. The appropriate use of technology is expected. Please refer to the material posted on the WSU website regarding academic integrity and acceptable student conduct and appropriate use of technology resources. The following website provides clarification and examples of the behaviors that are prohibited (<http://doso.wayne.edu/academic-integrity.html>).

In this regard, please be advised that written assignments, such as essay exam answers, papers, and other submissions if required by the course, may be submitted to SafeAssign software (or similar software or services) for an evaluation of the originality of your work, for assurance that these assignments contain no plagiarism, and for proper attribution of published sources, and may be included in the restricted databases of providers such as SafeAssign, solely for the purpose of detecting plagiarism. Plagiarism is a form of cheating and, consistent with the University's [Student Code of Conduct](#) and our School's [Code of Ethics](#) evidence of plagiarism in written assignments, or evidence of other violations, are grounds for further disciplinary action.

DISABILITY ACCOMMODATION

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. The SDS telephone number is 313-577-1851 or 313-202-4216 for videophone use. Once you have met with your disability specialist, I will be glad to meet with you privately during my office hours to discuss your accommodations. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University. You can learn more about the disability office at www.studentdisability.wayne.edu.

To register with Student Disability Services, complete the online registration form at: https://wayne-accommodate.symplicity.com/public_accommodation/

MANUFACTURING AND SUPPLY CHAIN ANALYTICS: COURSE SCHEDULE

TIMES FOR DUE DATES ARE EASTERN STANDARD TIMES
PLEASE CHECK CANVAS REGULARLY FOR UPDATES.

Online Module 1 (Feb 8th – Feb 13th) Introduction to Manufacturing & Supply Chain Analytics

- Reading: Class Slides
- Activity: Obtain Course Material and Install Course Based Software → Software Information Page
- *Analytics Tools*: Refresh Excel Basics (Review Excel Tutorial – as needed)
- *Discussion board #1*

Online Module 2 (Feb 15th – Feb 20th) - Prescriptive Analytics: Introduction to Optimization

- *Reading*: Chapter 13 & Class Slides
- *Analytics Application Topic*: The Product Mix Decision
- *Analytics Tools*: Introduction to Optimization in Excel
- *Discussion board #2*

Online Module 3 (Feb 22nd – Feb 27th) – Prescriptive Analytics: Manufacturing Applications

- *Reading*: Chapter 13, 14 & Class Slides
- *Analytics Application Topics*: Product Mix Decision, Production Planning (Multiple period and S&OP) Decisions, Fixed Cost Considerations in Production Decisions
- *Analytics Tools*: Optimization in Excel with Solver and Solver Table
- *Discussion Board #3*

Online Module 4 (March 1st – March 6th) – Prescriptive Analytics: Supply Chain Applications

- *Reading*: Chapter 13, 14 & Class Slides
- *Analytics Application Topics*: Logistics Decisions and Network Design Decisions
- *Analytics Tools*: Optimization in Excel with Solver and Solver Table
- *Quiz on material from Module 1 Module, 2, Module 3, & Module 4*

Online Module 5 (March 8th - March 13th) – Descriptive & Diagnostic Analytics

- *Reading*: Chapter 2, & 3 & Class Slides
- *Analytics Application Topics*: *Summarizing Data for various general business descriptive*
- *Analytics Tool*: Describing & Summarizing Data in Excel with built-in tools and add-ins (as needed)
- *Discussion board #4*

Spring Break (March 15th – March 20th) - No Class

Please take time this week to independently Review/Refresh Basic Statistics Concepts → Review chapters 7, 8, and 9 in the book. These would have been covered in your basic statistics foundation course. I will not cover these in our class, but assume that everyone is familiar with the basic concepts and terminology.

Online Module 6 (March 22nd – March 27th) – Predictive Analytics: Estimating Relationships in

Data

- *Reading:* Chapter 3, 10 & Class Slides
- *Hands on Work:* Various general business/operations mgt. topics
- *Analytics Tools:* Data Analysis in Excel with StatTools and/or DADM_Tools
- *Quiz on material from Module 5 & Module 6*

Online Module 7 (March 29th – April 3rd) – Predictive Analytics: Estimating Relationships &

Forecasting

- *Reading:* Chapter 11 & Class Slides
- *Analytics Application Topics:* Various business/operations mgt. topics
- *Analytics Tools:* Data Analysis in Excel with StatTools and/or DADM_Tools
- *Discussion Board # 5*

Online Module 8 (April 5th – April 10th) - Predictive Analytics: Forecasting & Time Series Analysis

- *Reading:* Chapter 12 & Class Slides
- *Analytics Application Topics:* Demand Forecasting
- *Analytics Tools:* Data Analysis in Excel with StatTools and/or DADM_Tools
- *Discussion Board #6*

Online Module 9 (April 12th – April 17th) Predictive Analytics: Data Mining & Pattern Recognition

- *Reading:* Chapter 17 & Class Slides
- *Analytics Application Topics:* Various business/operations mgt. topics
- *Analytics Application Topic:* Data Analysis in Excel with StatTools and/or NeuralTools
- *Quiz on material from Module 7, Module 8, & Module 9*

Online Module 10 - (April 19th – April 24th) – Data Visualization: Tableau

- *Reading:* Class Slides
- *Analytics Application Topics:* Various business/operations mgt. topics
- *Analytics Tool:* Tableau for Visualization
- *Discussion Board # 7*

Online Module 11 – (April 26th – May 1st Last official module of class) Data Visualization: Tableau

- *Reading:* Class Slides
- *Analytics Application Topics:* Various business/operations mgt. topics
- *Analytics Tool:* Tableau for Visualization
- *Tableau Assignment Due May 1st @ 11:59 PM.*

Extra Optional Module - Online Module O1 – Prescriptive Analytics: Decision Making Under Uncertainty

- *Reading: Chapter 5, 6, & Class Slides*
- *Analytics Application Topics: TBD*
- *Analytics Tool: Decision Analysis Excel with Precision Tree and/or DADM_Tools*

Extra Optional Module - Online Module O2 - Monte Carlo Simulations

- *Reading: Chapter 15, 16 & Class Slides*
- *Analytics Application Topics: TBD*
- *Analytics Tool: Simulation in Excel with @risk and/or DADM_Tools*