**THE OHIO STATE UNIVERSITY**
**FISHER COLLEGE OF BUSINESS**

# BUSML 4382
# LOGISTICS AND SUPPLY CHAIN ANALYTICS

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Email is the best method of reaching me on days outside of office hours.

## COURSE DESCRIPTION

BUSML 4382 can be described as a method course in Logistics and Supply Chain Management. We will cover a variety of logistics issues and discuss modeling approaches in supply chain management. The course is organized into five modules (Forecasting, Optimization, Inventory Management, Routing, and Network Design). Each module will consist of a series of lectures on analytical solution approaches to a class of problems.

## COURSE OBJECTIVES

The objectives of this course are to enable the students:

- be familiar with several modeling problems commonly faced in supply chain management,
- understand the uses of various methods to solve practical issues,
- be able to solve many of these problems using efficient heuristics (i.e. methods for finding good solutions to a problem) or optimization techniques (i.e. methods for finding the best solution),
- understand how companies address these problems in the "real world".

## COURSE MATERIALS

**Reference Books**

Render, Stair, and Hanna (2018). *Quantitative Analysis for Management* (*13th edition)*
Chopra and Meindl (2018). *Supply Chain Management: Strategy, Planning and Operation* (*7th edition)*

**Carmen** will be used to post course materials, announcements, changes to the course outline. Please check Carmen on a regular basis to stay current with the course.

## COURSE METHOD

**Method of delivery:** Hybrid delivery. This course is designed for hybrid delivery including in-person meetings, asynchronous lectures, and other online contents. There are required sessions when students must attend in-person meetings. Lectures will be designed to introduce or explain some of the principles being discussed. The teaching method will be a combination of lecture, class discussions on assigned topics, and some analysis/problems. Class meetings and lectures are required in this course. Reading course materials, but missing classes, does not guarantee a good performance in this course.

**Pace of activities:** This course is divided into weekly modules. Students are expected to keep pace with weekly deadlines but may schedule their efforts freely at their own pace within that time frame. In every week, lectures are in-person, live via Zoom, or recorded and posted online.

**Credit hours and work expectations:** This is a 3-credit-hour course. According to Ohio State policy, students should expect 3 hours per week of time spent on direct instruction (e.g., instructor content, Carmen activities, simulations, practice questions, etc.) in addition to 6 hours of homework (reading and assignment preparation, for example).

**Attendance and participation requirements:** The following is a summary of everyone's expected participation:

- **Participating in in-person meetings and online activities for attendance**: You are expected to attend in-person meetings and log in to the course in Carmen every week. During most weeks you will probably log in many times. If you have a situation that might cause you to miss an entire week of class, discuss it with me *as soon as possible.*
- **Office hours**: All office hours are optional.
- **Participating in class discussion**: Online class meetings will be as interactive as possible. Everyone is expected to participate in class discussion.
- **Dis-enrolled**: Any student who fails to complete an online assignment, without giving prior notification to the instructor, will be dis-enrolled after the third instructional day of the term, the first Friday of the term, or the second class meeting of the course, whichever occurs first.

## GRADES

Grades will be made up of the following items:

**Participation:** It is strongly suggested that you plan to attend every class during the semester. Each student is responsible for taking class notes and are expected to log in to the course in Carmen every week. If you must miss a class, it is your responsibility to gain an understanding of the material covered. Full attendance does not necessarily mean earning all the points for participation.

Your professional behavior and class participation/preparedness is also important. Each student is expected to conduct himself/herself in a professional manner as expected of business students, who are future participants of the business world. Disruptive, inappropriate, and/or unprofessional behavior will not be tolerated in any case.

In addition, each student is required to create a 5-minute presentation. The presentation should cover appropriate content regarding one or more Logistics applications. You can introduce a new application of data analysis in Logistics, summarize an article from BusinessWeek, WSJ, etc., or share your own experience associated with Logistics practice.

**Examinations**: There will be **Three** examinations to measure the mastery of material for content knowledge. All examinations will be closed book/closed note. The exams are not cumulative although some material will carry-over.

**Case Study:** The cases will be introduced in the first meeting for the case study and you will have additional days to work on the case. You are allowed to work on the case in teams of 3-5 individuals and hand in one write-up for the team. Student performance will be evaluated as a team, with each member receiving the same grade for the project.

**Issues associated with group effort or dynamic should be brought to the attention of the instructor as soon as possible. Waiting until the last minute to address these issues inevitably results in an unsatisfactory outcome of most parties involved.**

| Grade components | Percentage |
|---|---|
| Class Participation | 10% |
| Exam1 | 20% |
| Exam2 | 20% |
| Exam3 | 25% |
| Case Study | 25% |
| **Total** | **100%** |

In determining the final course grade, the following scale is used to convert points into letter grades:

| | |
|---|---|
| A = 93 - 100% | C = 73 - 76.99% |
| A- = 90 - 92.99% | C- = 70 - 72.99% |
| B+ = 87 - 89.99% | D+ = 67 - 69.99% |
| B = 83 - 86.99% | D = 60 - 66.99% |
| B- = 80 - 82.99% | E = 0 - 59.99% |
| C+ = 77 - 79.99% | |

## STUDENTS WITH DISABILITIES

Any student who feels she/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. In addition, you should contact the Office for Disability Services (ODS) at (614) 292-3307 or visit them at 150 Pomerene Hall. ODS will coordinate all accommodations for students with documented disabilities.

## MAKE-UP EXAM POLICY

Exams should not be missed for the convenience of the student. The dates of the major exams are shown on the Course Schedule. It is expected that you will schedule your activities around these exam dates. If a major exam is missed due to an approved university absence, you must inform the instructor before the exam. The format of the exam can be different from the exam given in class. Original documentation supporting your absence must be furnished to the professor. There will be no make-ups for missed exams without a university-approved excuse. An exam, whether regularly scheduled or make-up, that is missed without an approved excuse will be assigned a grade of ZERO.

## GENERAL

Students are STRONGLY encouraged to see the professor at the first sign of any problem or lack of understanding. Do not wait until it is too late!

## ACADEMIC INTEGRITY

The Fisher College Honor Code and the University Academic Misconduct Policy are strictly enforced. Please familiarize yourself with both. A useful description of academic misconduct is available at http://oaa.osu.edu/coam.html.

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. If a student is suspected of, or reported to have committed, academic misconduct in this course, I am obligated by University Rules to report my suspicions to COAM.. For additional information, see the Code of Student Conduct - Section 3335-23-04(A).

## SAFETY AND HEALTH REQUIREMENTS

All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

## COURSE TECHNOLOGY

For IT help contact the Ohio State IT Service Desk ocio.osu.edu/help servicedesk@osu.edu

1. Baseline technical skills for online courses.
    - Basic computer and web-browsing skills
    - Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.
2. Required Software. Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365 ProPlus through Microsoft's Student Advantage program.
3. Carmen Access. You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:
    - Register multiple devices in case something happens to your primary device. Visit the Duo Mobile application help article for step-by-step instructions.
    - Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click Enter a Passcode and then click the Text me new codes button that appears. This will text you ten passcodes good for 365 days that can each be used once.
    - Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options meet the needs of your situation, contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

## COURSE SCHEDULE

| *Week* | *Date* | *Topic* | *Readings* |
|---|---|---|---|
| 1 | Aug. 24 | Course Introduction | |
| 2 | Aug. 29 | Basic Decision Theory | |
| | Aug. 31 | Introduction to Forecasting | |
| 3 | Sep. 05 | Labor Day – No Class | |
| | Sep. 07 | Forecast Performance Measures | #1 |
| 4 | Sep. 12 | Time Series for Stationary Data | |
| | Sep. 14 | Time Series for Non-Stationary Data | |
| 5 | Sep. 19 | Regression and Decomposition | #2 |
| | Sep. 21 | Forecasting in Practice | |
| 6 | Sep. 26 | Practice Question Solutions & Exam I Review | |
| | Sep. 28 | **EXAM I** | |
| 7 | Oct. 03 | Heuristics & Vehicle Routing | #3 |
| | Oct. 05 | Introduction to Optimization | |
| 8 | Oct. 10 | Linear programming (LP) Graphical Solution I | #4 |
| | Oct. 12 | Linear programming (LP) Graphical Solution II | |
| 9 | Oct. 17 | Integer programming (IP) | |
| | Oct. 19 | Linear & Integer Programming Excel Solution | |
| 10 | Oct. 24 | Introduction to Case Study & Team up | |
| | Oct. 26 | Practice Question Solutions & Exam II Review | |
| 11 | Oct. 31 | **EXAM II** | |
| | Nov. 02 | Inventory Management I | |
| 12 | Nov. 07 | Inventory Management II | |
| | Nov. 09 | Inventory Management III | |
| 13 | Nov. 14 | Simulation I | #5,#6 |
| | Nov. 16 | Simulation II | |
| 14 | Nov. 21 | Inventory & Simulation Practice Questions | |
| | Nov. 23 | Thanksgiving Break – No Classes | |
| 15 | Nov. 28 | Network Design and Facility Location | #7 |
| | Nov. 30 | Case Study | Case Report Due |
| 16 | Dec. 05 | Practice Question Solutions & Exam III Review | on Dec. 07 |
| | Dec. 13 | **EXAM III** | |

## BUSML 4382 Course Reading Materials

My papers are available at https://www.researchgate.net/profile/Xiang_Wan4/research

Other readings are available through Business Source Complete on the library website.

#1. The Demand Management Process, Croxton et. al., IJLM, Vol. 13, #2.

#2. Too Much of a Good Thing? The Impact of Product Variety on Operations and Sales Performance. Xiang Wan, Philip Evers, and Martin Dresner. Journal of Operations Management Vol. 30(4), 316-324.

#3. Heuristics: Rules of Thumb for Logistics Decision Making, Ballou, JBL, Vol. 10, #1.

#4. Optimization Models for Logistics Decisions, Powers, JBL, Vol. 10, #1.

#5. Simulation in Logistics: A Review of Present Practice and a Look to the Future, Bowersox & Closs, JBL, Vol. 10, #1.

#6. System Analysis using Simulation. Philip Evers, Xiang Wan. Journal of Business Logistics Vol.33(2), 80-89.

#7. Supply Chains Networks with Multiple Retailers: A Test of Emerging Theory on Inventories, Stockouts, and Bullwhips. Xiang Wan and Philip Evers. Journal of Business Logistics Vol.32 (1), 27-39.

#8. Designing an Integrated Distribution System at DowBrands, Inc., Robinson, Gao & Muggenborg, Interfaces, Vol. 23, #3.

#9. Strategic Service Network Design for DHL Hong Kong, Cheung, Leung & Wong, Interfaces, Vol. 31, #4.

Note: JBL is the *Journal of Business Logistics*, IJLM is the *International Journal of Logistics Management*.

All articles can be found in the library or on-line through Business Source Complete. To find them with BSC, go to http://www.lib.ohio-state.edu/ and click on "Research Database List" on the right, go to "B" and click on "Business Source Complete." From there you can conduct a search using any combination of the author, the article title, or the journal title. Once you find the article, you should be able to click on "PDF Full Text" to download the article in PDF format. For some readings, you will have to click on the “Find It!” Button.