

**AAE422**  
**Food Systems and Supply Chains: Strategy, Planning, and Operation**  
**Syllabus**

Fall 2025  
T/Th, 9:30 – 10:45pm  
103 Taylor Hall

**Instructor:** Guanming Shi  
334 Taylor Hall  
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**Office Hours:** T/Th: 12 – 1:00pm

**Credit hours: 3 credits**

This class meets for two 75-minute class periods each week over the fall semester and carries the expectation that students will work on course learning activities (reading, writing, problem sets, studying, etc.) for about 3 hours out of classroom for every class period. The syllabus includes more information about meeting times and expectations for student work.

**Instructional mode: Face to face**

**Prerequisites:**

AAE 215, Econ 101 or 111, or instructor's consent.

**Learning Goals and Outcomes:**

This course will draw upon concepts from economics, business and management to accomplish its objectives. Activities in this course will focus on the use of these concepts to support quantitative assessment (that is, based on data) to inform decision making for individual businesses, supply chain partners, government policy makers, or society more generally.

Learning outcomes:

1. Describe food supply chain (network) components, processes, objectives, drivers and performance metrics, and the main differences in characteristics and management practices for food and agricultural supply chains compared to supply chains for non-food manufactured products;
2. Analyze sourcing, purchasing and inventory management decisions for raw materials or finished goods;
3. Describe the metrics and processes that food businesses use to monitor and improve sustainability, in the context of Corporate Social Responsibility;
4. For graduate student credit: Undertake a review of a subset of relevant literature on a topic or issue related to food supply chains or food systems (with pre-approval of the instructor), and relate the content of that review to the concepts covered in this course.

**Textbook:** *Supply Chain Management: Strategy, Planning, and Operation*, 8e, Sunil Chopra, Pearson 2026. <https://www.pearson.com/store/p/supply-chain-management-strategy-planning-andoperation/P100000803793/9780137502844>

This textbook is available from Pearson at the websites provided. The most cost effective way to access them is to rent eText.

## Grades

60% homework - 15% each: Homework will consist of 4 problem sets that tie into the lectures. They will be comprised of both mathematics as well as some short answers and readings. Feel free to work together, but make sure your answers are your own.

30% final project: The final project is the main deliverable of this course. The goal is to perform an analysis of a topic related to the agricultural and food system supply chain for a particular innovation, organization, company, or region. The final project deliverables are a written report due the last week of class (25%) and an in-class presentation (5%). We will go over the project requirements and details more thoroughly as the semester progresses. You may work individually or in groups of up to 3 people.

Individuals: 7-minute presentation, 10-11 page paper

Group of 2: 9-minute presentation, 14-15 page paper

Group of 3: 11-minute presentation, 18-20 page paper

10% in-class participation and attendance: Participation is invaluable for making the most of this course. We all participate in various ways - this may involve speaking during class discussion, asking questions, attending office hours, assisting a classmate, or even bringing in outside material relevant to the course. All of these are acceptable.

Grading Scale: 100-90 A, 89-85 AB, 84-76 B, 75-72 BC, 71-63 C, 62-56 D, 55-0 F

## Overview of Contents:

1. Introduction (Lectures 1&2)
  - a. Economics background and Concepts
  - b. Components, decisions and performance metrics in Supply Chain Management
2. What is different about food and agriculture supply chains? (Lecture 3&4)
  - a. Environment, climate, and globalization
  - b. *Guest speaker on Global Food Supply Chain System* (tentative)

3. Network Design in the supply chain (Lecture 5)
  - a. Factors influencing supply chain network design decisions.
  - b. Framework for making network design decisions.
4. Demand Forecasting in a Supply Chain (Lectures 6, 7, 8)
  - a. Components and basic approaches
  - b. Time-series forecasting models
  - c. Risk, uncertainty, and forecasting errors
5. Supply Planning in a Supply Chain (Lectures 9, 10, 11)
  - a. Components and basic approaches
  - b. Linear programming models
  - c. Risk, uncertainty, and sales and operations planning
6. Managing Economies of Scale in a Supply Chain (Lectures 12, 13, 14)
  - a. Lot size vs. cycle inventory
  - b. Discounting schemes and trade promotions
  - c. Replenishment policies and managerial levers
7. Managing Uncertainty in a Supply Chain (Lectures 15, 16, 17)
  - a. Role of safety inventory
    - i. How they matter
  - b. Factors and impact analysis
8. Transportation in a Supply Chain (Lectures 18, 19)
  - a. Concepts and Issues
  - b. Economics and influencing factors
  - c. Product availability
9. Sourcing Decisions in a Supply Chain (Lectures 20, 21)
  - a. Supplier portfolio and outsourcing decisions
  - b. Resilience and risks
10. Sustainability and the Supply Chain (Lectures 22, 23)
  - a. Challenges and opportunities
    - i. Environmental pillars and key metrics
  - b. Segmentation and tailoring
11. *Guest Speaker from Culvers: Business Practices in the Real World* (tentative) (Lecture 24)
12. Information Technology and Supply Chain Management (Lectures 25, 26)
  - a. Challenges and opportunities with new technology
    - i. Big data, machine learning, AI, blockchain and automation technologies
  - b. *Guest speaker on digital economy and food system supply chain* (tentative)

## **ACADEMIC INTEGRITY**

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to [studentconduct.wiscweb.wisc.edu/academic-integrity/](http://studentconduct.wiscweb.wisc.edu/academic-integrity/).

## **PLAGIARISM**

Plagiarism is a serious offense. All sources and assistance used in preparing documents must be precisely and explicitly acknowledged. Ignorance of what constitutes plagiarism or academic misconduct is not a defense. It is your responsibility to be sure. The internet and artificial intelligence create special risks. Cutting and pasting even a few words from a web page or paraphrasing material without a reference constitutes plagiarism. If you are not sure how to refer to something you find on the internet, you can always give the URL. It is generally better to quote than to paraphrase from material on the web, because in the absence of page numbers it can be hard to find passages that are paraphrased rather than quoted. For more information on writing and source citation, the following may be helpful:

<http://writing.wisc.edu/Handbook/Documentation.html>

## **ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES**

McBurney Disability Resource Center syllabus statement: "The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform faculty [me] of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. Faculty [I], will work either directly with the student [you] or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA." <http://mcburney.wisc.edu/facstaffother/faculty/syllabus.php>