SIE 462/562 Production Systems Analysis
Spring 2026

Department of Systems and Industrial Engineering
The University of Arizona

Course Number: SIE 462/562
Course Title: Production Systems Analysis
Time: MWF 12:00 PM – 12:50 PM
Location: Haury Anthro Bldg, Rm 129

Instructor: Dr. Yue Wang, Assistant Professor
Email: ywang23@arizona.edu
Office Location: ENGR 127
Office Hours: [In-person & Zoom] Mon. 2:00-3:00 PM MST, or by appointment
 (Zoom link: D2L -> UA Tools -> Zoom)

Teaching Assistant: Majed Alasiri
Email: malasiri@arizona.edu
Office Hours: [Zoom] Tue. & Thu. 3:00-4:00 PM MST (by D2L -> UA Tools -> Zoom)
 [In-person] By appointment

Prerequisites: SIE 305, SIE 340, knowledge of mathematical programming, basic
stochastic process and probability models, or consent of advisor.

Course Description:
Principles, models, and techniques for planning and analysis of production and distribution
systems; application of mathematical optimization models and solution methods for aggregate
planning, supply chain planning, push (MRP) and pull (JIT) material flow management, and
inventory control under deterministic and stochastic demands.

Learning Objectives:
At the end of the courses, students should be able to:
- Describe different types and levels of decision making in a production system.
- Model, formulate, solve, analyze problems arising in aggregate production and supply
  chain planning.
- Model and analyze fundamental inventory control systems with known and uncertain
  demand.
- Describe and analyze push (MRP) and pull (JIT) production systems.

Required Textbook: *Production and Operations Analytics, 8th Edition,* S. Nahmias and T.
Lennon Olsen, ISBN-13: 978-1-4786-3926-8, ISBN-10: 1-4786-3926-1.

Course Website: The course will use D2L (http://d2l.arizona.edu). You can login to the system using your NetID username and password. Please check the course website regularly, as it will be used to post announcements, quizzes and exams, homework assignments, lecture slides, and other course information. **<u>Any information posted on the course website will be treated as if it is announced in the class and you are responsible to be aware of it.</u>**

Video Recording of Lectures
Each class session will be recorded and uploaded to the Panopto folder assigned to the course. From the course D2L page you will see the "Panopto Video" options listed under UA Tools.

Course Assessment:

	Undergraduate	Graduate
Homework Assignments (1-8)	10%	10%
Quizzes (1-7)	15%	15%
Quantitative Case Studies	20%	Not required
Midterm Exam	25%	20%
Final Exam	30%	25%
Course Project	Not required	30%
Total	**100%**	**100%**

Remarks:
- Problems given in quizzes and exams will vary between 462 and 562 students.
- **Important dates and deadlines (by 11:59 PM MST)**:
  - Midterm Exam: **03/04** Wednesday 12:00-12:50 PM during regular class time
  - Final Exam: **05/13** Wednesday 10
  - :30AM-12:30PM (<u>university final schedule</u>)
- For remote students enrolled in Sections 462-010, 562-025, and 562-210
  - You may take the exams remotely through Honorlock. Be sure to read the <u>Honorlock instructions</u> in advance and confirm that your device and testing environment satisfy all system requirements.
- For students in Section 462-110 (main campus, online section)
  - In-person attendance for lectures is not required; however, you are expected to take the exams **in person** as scheduled.

Grading Scale:
- A = 90-100%
- B = 80-89%
- C = 70-79%
- D = 60-69%
- E = < 60%

Extra Credits Opportunities
Bonus exercises, based on textbook problems solved in class, will be available on D2L throughout the semester. By actively completing these exercises, students can earn up to 10 extra points.

Course Outline:
- Chapter 1 Strategy and Competition
- Chapter 2 Forecasting
  - Forecasting basics
  - Time series forecasting methods
    - Moving averages
    - Exponential smoothing
    - Linear regression
    - Trend-based methods
    - Seasonality-based methods
- Chapter 3 Sales and Operations Planning (S&OP)
  - Introduction to S&OP
  - Quantitative methods for S&OP
- Chapter 4 Inventory Management with Known Demand
  - Inventory fundamentals and the Economic Order Quantity (EOQ) model
  - EOQ with finite production rate and under quantity discounts
  - EOQ for multiproduct systems
  - EOQ models for production planning
- Chapter 5 Inventory Management with Uncertain Demand
  - Uncertainty and the Newsvendor problem
  - (Q, R) system and the service levels (Type 1 and Type 2)
- Chapter 6 Supply Chain Strategy
- Chapter 7 Supply Chain Analytics
  - Network design and facility location models
  - Transportation and routing problems and solution methods
- Chapter 8 Service Operations Management
  - Introduction to service systems
  - Poisson process, Queuing systems and general Queuing models
- Chapter 9 Production Control Systems: Push and Pull
  - Push (MRP) and Pull (JIT) basics
  - Lot sizing in MRP systems
  - JIT fundamentals

Homework Policies:
- The penalty for late submission (within 72 hours) is 30% of the points allocated to the assignment. Submission will not be accepted if it is more than three days late.
- Students may work together on homework assignments, **but identical submissions will receive zero points.**

Exam Policies:
- Exams are open book and open notes. However:
    - Use of email or any other communication apps (texting, Whatsapp, GroupMe, etc.) is prohibited during exam time.
    - Use of Generative AI (ChatGPT, etc.) or search engine (Google, Bing, etc.) is prohibited during exam time.
- Detailed exam instructions will be provided by the instructor prior to or during each exam.

Absence and Make-up Policies:
- Missing an exam or a regular quiz is only allowable with an excuse pre-approved by the UA Dean of Students office. For more information, please refer to Attendance Policies and Practices.
- Missing an exam or a regular quiz without an approved absence will result in a grade of zero with no option to retake.
- No make-ups will be provided for bonus quizzes.

Classroom Behavior Policy:
To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Code of Academic Integrity:
Graded work must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: https://deanofstudents.arizona.edu/policies/code-academic-integrity. There is zero tolerance towards plagiarism and any act of intellectual dishonesty.

Accessibility and Accommodations:
Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcomed to contact Disability Resources (520-621-3268) to establish reasonable accommodations. For additional information on Disability Resources and reasonable accommodations, please visit http://drc.arizona.edu/. If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Threatening Behavior Policy:

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

Nondiscrimination and Anti-harassment Policy:
The University is committed to creating and maintaining an environment free of discrimination; see http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy.

Subject to Change Statement:
Information contained in the course syllabus, except the grading policy, may be subject to change.