ILLINOIS
Gies College of Business

SYLLABUS

READINGS, SCHEDULE, AND ASSIGNMENTS SUBJECT TO CHANGE, AND WILL BE UPDATED ON CANVAS

BIOE 573: MANAGING BUSINESS OPERATIONS
FALL 2025

CLASS MEETS: TUESDAYS AND THURSDAYS, 12:30 PM – 01:50 PM
DAVID KINLEY HALL, 312
OFFICE HOURS: BY APPOINTMENT

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Course Description

Producing and delivering products – goods and services – involves interrelated activities such as developing new products and putting together a product portfolio, choosing the appropriate design and technology for producing them, ensuring that products are of high quality, planning and controlling the flow of materials or customers, and distributing finished products. This course provides an introduction to such decisions and an overview of related activities.

The first two modules, titled Operations Management and Process Improvement, focus on ways of developing, making, and delivering goods and services efficiently and effectively – generating value by satisfying ever-changing customer needs while improving profitability. An important question that follows is how a company should decide on what products, in its current portfolio, to keep producing, or what new products should it invest in innovating and developing. The third module – New Product Development – provides an overview of innovation management and new product development, focusing on decisions such as what products should a firm continue to produce, and what new products should it invest in innovating and developing.

Course Goals

Upon successful completion of the three modules of this course, you will be able to:

Module 1 – Operations Management
- understand decisions faced by operations managers,
- appreciate the significance of alignment of the operations function with other functions such as finance, marketing, and engineering,
- develop skills and use frameworks and techniques in analyzing operations.

Module 2 – Process Improvement
- assess and categorize variation in processes and compare process potential with customer requirements,
- conduct root cause analysis for improving processes,
- appreciate the use of process improvement frameworks used by firms.

Module 3 – New Product Development
- recognize why and how consumers adopt new products,
- point out barriers to the adoption of new products,
- gain basic understanding of the ‘New Product Development’ process,
- apply understanding of the consumer adoption process to develop successful new products.

Required Materials

1. Readings packet: Cases and articles to be purchased online from Harvard Business Publishing https://hbsp.harvard.edu/import/1325430
2. Library downloads: Articles from University of Illinois library databases
3. Canvas: Cases, articles, and class notes posted throughout the semester

Readings that can be accessed from Library Databases

1. Christensen CM, Anthony SD, Berstell G, Nitterhouse D. (2007). "Finding the Right Job for Your Product." MIT Sloan Management Review, 48(3), 38-47.
2. Coyne, K.P., Clifford P.G., and Dye R. (2007). "Breakthrough Thinking from Inside the Box." Harvard Business Review, 85(12), 70-78.

Performance Evaluation (See course schedule for due dates and Canvas for details)
Your final grade in the course will be based on the following:

Homework Assignments (6 * 5% each)	30%
Exam 1 – Operations Management	25%
Exam 2 – Process Improvement	25%
Take Home Case Exam – New Product Dev.	20%
TOTAL	100%

Course Website

We will be using Canvas: https://canvas.illinois.edu/ for readings, class slides, quizzes, assignments, grades, and any supplementary materials. PLEASE CHECK THE CANVAS WEBSITE REGULARLY, MAKE NOTE OF REGULAR MAINTENANCE HOURS WHEN CANVAS IS DOWN, AND ALLOW FOR THOSE TIMES AS YOU PLAN YOUR WORK AROUND ACCESS TO THE MATERIAL. All assignment- and exam- scores and your final grade will be available to you on this website.

Pedagogy

Classes will consist of lecture-discussions, expanding on concepts from assigned readings as well as analyzing assigned cases. You will be introduced to conceptual frameworks and tools that can help you to better understand and make operations and new product development decisions. The homework assignments are designed for you to gain an appreciation of the trade-offs in real world situations and to get practice in the use of established frameworks and tools and techniques. Your regular and active participation in the multiple modes of learning is critical for your success in this class and for you to get the most from this course. Our aim is to make this course value-added and interesting for you, so that at the end of the semester you are equipped with ways of thinking and a set of tools that you can utilize in your careers.

Homework Assignments

The purpose of the homework assignments is to provide a structured framework for applying concepts and tools from class and developing problem solving skills. Questions for cases used for class discussion and questions and instructions for the assignments will be provided in class and/or on Canvas. All homework assignments are due via Canvas at the start-time of class on the due date unless otherwise indicated in the assignment instructions.

Special Accommodations

If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work outlined in this syllabus or which will require academic accommodation, please notify us at the earliest. We will strive to accommodate you in collaboration with Disability Resources and Educational Services (DRES). Please visit the DRES website if you would like additional information on this topic.

Academic Integrity

Academic integrity is critical to maintain a fair atmosphere for learning. Sections I-401 through 406 of the student code contains details of the university policy regarding academic integrity. Penalties for violations range from a zero on the assignment to failure for the course.

Artificial Intelligence (AI) Usage

Generative AI, such as OpenAI ChatGPT, Microsoft Copilot/Bing Chat, Google Gemini, and others, can answer questions and generate text, images, and media. The appropriate use of generative AI will vary from course to course. The general guidelines for using generative AI in any course are:

Document and attribute all AI contributions to your coursework.
Take full responsibility for AI contributions, ensuring the accuracy of facts and sources.

In this course, AI usage is not permitted for work on the exams, quizzes, and assignments (except when explicitly instructed in the assignment to refer to Internet resources).

You may use AI resources limited to the following:

Shortening your text on the slides for the team project
Checking your own text for spelling and grammar on any submission
Creating study aids (e.g., flash cards, reference sheet) in preparation for exams
Testing and practicing your knowledge of course topics
Conducting basic research on course and assignment topics

When using generative AI, keep a journal documenting prompts, AI responses, and your usage, or, if possible, share a link to your chat history.

Refer to the APA style guide for citing generative AI, including the text of your prompt to the AI. Remember, a generative AI conversation in and of itself is not a valid source for facts. Always work to find, verify, and cite the original source of ideas, rather than citing the AI directly. Review the University of Illinois System's Generative AI Guidance for Students.

You are responsible for verifying sources and facts and attributing ideas generated by the AI. Generative AI tools sometimes invent facts and sources. Failure to abide by these guidelines is a violation of academic integrity.

Generative AI and Data Privacy

When using online services, including generative AI platforms, please realize that companies may store, share, or sell your data. Be wary of sharing private personal information. Learn to develop safe online habits (Illinois Privacy & Cybersecurity).

AI Analysis Disclaimer

Your assignments may be stored in various online data repositories in an anonymous form and may be searchable and analyzable. Please be aware of this possibility and do not include proprietary information

relating to companies or organizations, your personal private information, or personal and private information of others.

General Emergency Response Recommendations

These recommendations are provided by the Office of Campus Emergency Planning.
https://police.illinois.edu/em/emergency-response-guide/
There are two basic methods to respond in emergencies that may affect persons on campus, and more specifically, individual buildings: Building Evacuation (**GET OUT**) and Shelter-In-Place (**STAY IN**). **ONLY FOLLOW THESE ACTIONS IF SAFE TO DO SO.** When in doubt, follow your instincts - you are your best advocate!

Building Evacuation (GET OUT) — Action taken to leave an area for personal safety.

- Take the time to learn the different ways to leave your building **BEFORE** there is an emergency.
- Evacuations are mandatory for fire alarms and when directed by authorities! No exceptions!
- Evacuate immediately. Pull manual fire alarm to prompt a response for others to evacuate.
- Take critical personal items only (keys, purse, and outerwear) and close doors behind you.
- Assist those who need help, but carefully consider whether you may put yourself at risk.
- Look for **EXIT** signs indicating potential egress/escape routes.
- If you are not able to evacuate, go to an Area of Rescue Assistance, as indicated on the front page of this plan.
- Evacuate to Evacuation Assembly Area, as indicated on front page of this plan.
- Remain at Evacuation Assembly Area until additional instructions are given.
- Alert authorities to those who may need assistance.
- Do not re-enter building until informed by emergency response personnel that it is safe to return.

Shelter-in-Place (STAY IN) — Action taken to seek immediate shelter indoors when emergency conditions do not warrant or allow evacuation.

Severe Weather

- If you are outside, proceed to the nearest protective building.
- If sheltering-in-place due to severe weather, proceed to the identified Storm Refuge Area or to the lowest, most interior area of the building away from windows or hazardous equipment or materials.
- Storm refuge location for BIF is the basement.

How to respond to an emergency https://police.illinois.edu/emergency-preparedness/run-hide-fight/

Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.

Run

Leaving the area quickly is the best option if it is safe to do so.

☐ Take time now to learn the different ways to leave your building.

- Leave personal items behind.
- Assist those who need help, but consider whether doing so puts yourself at risk.
- Alert authorities of the emergency when it is safe to do so.

Hide

When you can't or don't want to run, take shelter indoors.

- Take time now to learn different ways to seek shelter in your building.
- If severe weather is imminent, go to the nearest indoor storm refuge area.
- If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area if possible, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.

Fight

As a last resort, you may need to fight to increase your chances of survival.

- Think about what kind of common items are in your area which you can use to defend yourself.
- Team up with others to fight if the situation allows.
- Mentally prepare yourself – you may be in a fight for your life.

Please be aware of people with disabilities who may need additional assistance in emergency situations.

Other resources

- https://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/
- police.illinois.edu/safe for more information on how to prepare for emergencies.
- emergency.illinois.edu to sign up for Illini-Alert text messages.
- Follow the University of Illinois Police Department on Twitter and Facebook

COURSE OUTLINE (Minor changes, if any, will be announced in class, and posted on Canvas)

MODULE I: OPERATIONS MANAGEMENT

Aug. 26	Session 1	Topic:	Introduction to Operations Management
Aug. 28	Session 2	Topic:	Operations Strategy, and Process Metrics
		Analyze:	*Ritz Carlton* (Pages 1-6 and Exhibits 1-3) (Readings Packet)
Sep. 2	Session 3	Topic:	Process Flow
		Read:	*Business Processes …* (Readings Packet)
Sep. 4	Session 4	Topic:	Bottlenecks
		Submit:	**Homework 1 (See Canvas for details, Due 9:00 am)**
Sep. 9	Session 5	Topic:	Process Variability
		Analyze:	*Paediatric Orthopaedic Clinic* (Readings Packet)
Sep. 11	Session 6	Topic:	Value Stream Management
		Analyze:	Case posted on Canvas
Sep. 16	Session 7	Topic:	Inventory Management
		Read:	*Managing Inventories* (Readings Packet)
		Submit:	**Homework 2 (See Canvas for details, Due 9:00 am)**
Sep 18	Session 8	Topic:	Supply Chain Management
		Analyze:	*Bergerac Systems* (Readings Packet)
Sep. 23	Session 9	Topic:	Project Management
Sep. 25	Session 10		**In-class exam 1**

MODULE II: PROCESS IMPROVEMENT

Sep 30	Session 11	Topic:	Product and Process Quality
		Analyze:	*Paul Chesler* (Readings Packet)
Oct. 2	Session 12	Topic:	Statistical Process Control (SPC)
		Read (Optional):	Managing Quality with Process Control (Reading Packet)
Oct. 7	Session 13	Topic:	Process Capability
Oct. 9	Session 14	Topic:	Qualitative Root Cause Analysis (RCA)
Oct. 14	Session 15	Topic:	Qualitative Analysis (continued) and Defining Project
		Analyze:	Objectives
		Submit:	*It's A Dirty Job* (Readings Packet)
			Homework 3 (See Canvas for details, Due 12:30 pm)
Oct. 16	Session 16	Topic:	Quantitative RCA using ANOVA
Oct. 21	Session 17	Topic:	Quantitative RCA using Regression
		Analyze:	*It's A Dirty Job* (Readings Packet)
		Submit:	**Homework 4 (See Canvas for details, Due 12:30 pm)**
Oct. 23	Session 18	Topic:	Organizing Process Improvement Initiatives
		Analyze:	*Six Sigma at Academic Medical Hospital* (Readings Packet)

Oct. 28	Session 19	Topic:	Making Process Improvement a Habit
		Discuss:	*Ritz Carlton* (Readings Packet)
Oct. 30	Session 20		**In-class exam 2**

MODULE III: NEW PRODUCT DEVELOPMENT

Nov. 4	Session 21	Topic:	New Products: Introduction
Nov. 6	Session 22	Topic:	New Product Adoption
		Read:	*Eager Sellers & Stony Buyers* (Readings Packet)
Nov. 11	Session 23	Topic:	Case Discussion
		Analyze:	*Aqualisa Quartz* (Readings Packet)
		Submit:	**Homework 5: Case Analysis – Aqualisa Quartz (See Canvas for details, Due 12:30 pm)**
Nov. 13	Session 24	Topic:	Identifying Opportunities for New Product Development
		Read:	*Finding the Right Job for Your Product (*Library Readings)
Nov. 18	Session 25	Topic:	Ideation
		Read:	*Breakthrough Thinking from Inside the Box* (Library Readings)
Nov. 20	Session 26	Topic:	Concept Generation and Evaluation
		Read:	*Researching and Monitoring Consumer Markets* (Readings Packet)
Nov. 22 – Nov. 30			**No Classes; Fall Break**
Dec. 2	Session 27	Topic:	Case Discussion
		Analyze:	*Nestle Contadina* (Readings Packet)
		Submit:	**Homework 6: Case Analysis – Nestle Contadina** (Readings Packet) **(See Canvas for details, Due 12.30 pm)**
Dec. 4	Session 28	Topic:	Processes and Tools for New Product Development
Dec. 9	Session 29		Final take home case exam - submission
		Analyze:	*Innovation at 3M Corp. (A)* (Readings Packet)
		Submit:	**Take-home Case Exam (See Canvas for details, Due 5:00 pm)**