BIOE 573: MANAGING BUSINESS OPERATIONS
FALL 2024

CLASS MEETS: TUESDAYS AND THURSDAYS, 12:30 PM – 01:50 PM
LINCOLN HALL, 1064
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, insuring 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/1200941
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. Swank, C. K. (2003). "The Lean Service Machine." Harvard Business Review, 81(10), 123-130.
2. Christensen CM, Anthony SD, Berstell G, Nitterhouse D. (2007). "Finding the Right Job for Your Product." MIT Sloan Management Review, 48(3), 38-47.
3. 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 accommodations, please notify me at the earliest. We will strive to accommodate you in collaboration with Disability Resources and Educational Services (DRES). Please visit the DRES website http://www.disability.illinois.edu/ if you would like additional information on this topic.

Academic Integrity
Academic integrity is critical in order 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 and can be accessed at:

. Penalties for violations range from a zero on the assignment to failure for the course.

General Emergency Response Recommendations
These recommendations are provided by the Office of Campus Emergency Planning.
https://police.illinois.edu/emergency-preparedness/
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. 27   Session 1   Topic: Introduction to Operations Management

Aug. 29   Session 2   Topic: Operations Strategy, and Process Metrics
                        Analyze: *Ritz Carlton* (Pages 1-6 and Exhibits 1-3) (Readings Packet)

Sep. 3   Session 3   Topic: Process Flow
                        Read: *Business Processes …* (Readings Packet)
                        Submit: **Homework 1**
                                (See Canvas for details, Due 9:00 am)

Sep. 5   Session 4   Topic: Bottlenecks

Sep. 10   Session 5   Topic: Process Variability
                        Analyze: *Paediatric Orthopaedic Clinic* (Readings Packet)

Sep. 12   Session 6   Topic: Value Stream Management
                        Analyze: Case posted on Canvas

Sep. 17   Session 7   Topic: Inventory Management
                        Read: *Managing Inventories* (Readings Packet)
                        Submit: **Homework 2**
                                (See Canvas for details, Due 9:00 am)

Sep 19   Session 8   Topic: Supply Chain Management
                        Analyze: *Bergerac Systems* (Readings Packet)

Sep. 24   Session 9   Topic: Organization of Lean
                        Read: *Lean Service Machine* (Access from library database)

Sep. 26   Session 10   **In-class exam 1**

MODULE II: PROCESS IMPROVEMENT

Oct. 1   Session 11   Topic: Organizing Process Improvement Initiatives
                        Analyze: *Academic Medical Hospital* (Readings Packet)

Oct. 3   Session 12   Topic: Process Capability
                        Analyze: *Gati* (Readings Packet)

Oct. 8   Session 13   Topic: Statistical Process Control (SPC)
                        Analyze: *Gati*

Oct. 10   Session 14   Topic: Qualitative Analysis for Cause Effect

Oct. 15   Session 15   Topic: Qualitative Analysis for Cause Effect (continued)
                        Analyze: *It's A Dirty Job* (Readings Packet)
                        Submit: **Homework 3**
                                (See Canvas for details, Due 9:00 am)

Oct. 17   Session 16   Topic: Quantitative Analysis for Cause Effect
                        Analyze: *It's A Dirty Job*

Oct. 22	Session 17	Topic:	Quantitative Analysis for Cause Effect (Continued)
		Analyze:	*It's A Dirty Job*
		Submit:	**Homework 4**
			(See Canvas for details, Due 9:00 am)

| Oct. 24 | Session 18 | Topic: | Process Improvement |
| | | **Analyze:** | TBD (Readings Packet) |

| Oct. 29 | Session 19 | Topic: | Making Process Improvement a Habit |
| | | **Analyze:** | *Ritz Carlton* (Readings Packet) |

| Oct. 31 | Session 20 | | **In-class exam 2** |

MODULE III: NEW PRODUCT DEVELOPMENT

| Nov. 5 | Session 21 | Topic: | New Products: Introduction |

| Nov. 7 | Session 22 | Topic: | New Product Adoption |
| | | **Read:** | *Eager Sellers & Stony Buyers* (Readings Packet) |

Nov. 12	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. 14 | Session 24 | Topic: | Identifying Opportunities for New Product Development |
| | | **Read:** | *Finding the Right Job for Your Product (*Library Readings) |

| Nov. 19 | Session 25 | Topic: | Ideation |
| | | **Read:** | *Breakthrough Thinking from Inside the Box* (Library Readings) |

| Nov. 21 | Session 26 | Topic: | Concept Generation and Evaluation |
| | | **Read:** | *Researching and Monitoring Consumer Markets* (Readings Packet) |

| **Nov. 25 – Nov. 29** | | | **No Classes; Fall Break** |

Dec. 3	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. 5 | Session 28 | Topic: | Processes and Tools for New Product Development |

Dec. 10	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)**