

SYLLABUS, FALL 2020
SCM 7325 (24480): Process Analysis and Design
C. T. Bauer College of Business, University of Houston;
Department of Decision and Information Sciences
Version August 18, 2020

Instructor: Dr. Powell Robinson, Professor of Supply Chain Management
Office: 334 Melcher Hall-Room 260B
Phone: (713) 743-4296 (Note this is my office number at school.)
E-Mail: eprobinson@uh.edu Email is the most effective way to reach me.
Class Time: 6:00-9:00 pm, Wednesday: all class meetings will be on-line.
Office Hours: Wednesday 4:30-5:30 pm, immediately after class, and by appointment.
I will schedule additional office hours prior to each exam.

Course Description

This course introduces student to the concepts, issues and techniques used to plan, analyze and control business processes, including both production and service organizations. A special emphasis will be placed on quality management. We will examine business process from a strategic design and operational execution perspective. Organizations that do not continually improve their quality and productivity can rarely keep up with competition. Improvement requires a clear understanding of the business in which the firm competes, how to align its delivery processes such that the company excels on its core competencies, an ability to assess performance, and a plan to ensure continual improvement in the firm's products and processes. The essence of process management is to answer the questions, "How is the process doing?" and "How can it do better?"

The course consists of three Modules.

- Module 1 explores how firms seek to create and capture value for its stakeholders through their choice of business strategy and operating processes.
- Module 2 utilizes case study to examine alternative process types in order to understand the techniques and analytics that are most useful for process analysis and design.
- Module 3 explores quality management and process improvement, which is how firms design processes that meet customer expectations, insure that they continue to operate as designed, and techniques for process improvement.

Course Objectives

Upon completion of the course, the student will:

1. Understand business processes and how they should be designed to support competitive priorities in both manufacturing and service environments.
2. Be able to flow chart a business process in terms of inputs, outputs, activities, and related decisions
3. Recognize opportunities to significantly improve business performance by designing efficient and effective processes.
4. Benefit from further development of critical thinking skills to recognize, formulate, and analyze operational problems.
5. Be able to use analytical tools and methods to effectively model, measure and compare alternative business processes.
6. Be able to analytically determine a process' capability to meet customer specifications and methods for insuring that the process continues to provide an acceptable product.
7. Understand the basics of Six Sigma and its role in continual process improvement.

Course Materials

Textbook: select chapters from: *Operations and Supply Chain Management: The Core*, 5th edition, by F. Robert Jacobs and Richard B. Chase, McGraw-Hill Irwin, 2020. ISBN 978-1-260-23888-4. (This text is also used in SCM 6A01).

Case Studies/Readings: There is a course page created on Harvard Business Online for you, where you can purchase the cases and a reading required for the course. The link and content is listed below :

<https://hbsp.harvard.edu/import/748605>

HBS Packet Purchase from HBS

- Case: “Kristen’s Cookie Company (A) HBSP, 608037
- Read: “Process Analysis, Curriculum Core”, by Roy Shapiro (# 8007 in HBSP packet)
- Case: “AIC NetBook: Optimizing Product Assembly” (# 4245 in HBSP packet)
- Case: “National Cranberry Coop” (#9-688-122 in HBSP packet)
- Case: “Breakfast at the Paramount”, (#9-617-011 in HBSP packet)
- Case: “Toyota Motor Manufacturing, U.S.A., Inc.,” HBSP, 5-693-019
- Case: “Hank Kolb, Director of Quality Assurance” HBSP, 681083

Videos: Several videos will be included in the weekly schedule. There are two types of videos:

1. Topic focused videos introducing topics and clarifying process design techniques.
2. Business application videos illustrate how process analysis and design relates to business strategy, interfaces with other business functions, and provides competitive advantage.

Course Structure

This course meets once a week online via live (Zoom) sessions. In class we will discuss the material covered by the cases, readings and videos. Please keep in mind that class activities enhance understanding of the materials found in the course material, not replace them. You must review the assigned course material before class!

Homework/suggested problems, quizzes, case studies and exams provide an opportunity to apply the concepts developed in the course and demonstrate knowledge of the material.

Performance Evaluation

The following scale is used to convert points into letter grades:

A = 93 - 100 %	A- = 90 - 92 %
B+ = 88 - 89 %	B = 80 - 87 %
C+ = 78 - 79 %	C = 70 - 77 %
D = 60 - 69%	F = 0 - 59%

Grade components and weight:

Exam 1: 30%, Exam 2: 25%, Exam 3: 20%, Assignments: 15%, In class performance: 10%

1. Exams will be on line and will cover material from lectures, readings, cases and study problems. The exam format will be primarily multiple-choice questions, but may also include a take-home component. You will need a calculator (no cell phones) for the exams.

2. Assignments include pre-announced homework and quizzes. Preparing notes for the discussion questions and working assigned problems provides a solid foundation for success on the quizzes.
3. In class Performance: I view each class as a business meeting. During these meetings, I look for evidence of your preparation and understanding of the class material, which can only be exhibited by in-class contributions. Helping to advance the learning of classmates is an important component of in-class performance
1. **Study Groups**: I strongly encourage students to form study groups for the course. This will provide a resource for information should you miss class, a venue for discussing assignments, and a study group for exams.
2. **Blackboard**: Course materials, announcements, grades or changes to the course outline will be posted on Blackboard. Check Blackboard before every class for important announcements, class notes, emails, grades and changes to the course schedule.

I HOPE YOU HAVE A PRODUCTIVE AND ENJOYABLE SEMESTER!

SCM 7325 Process Analysis and Design

Course Schedule Fall 2020

MODULE 1: BUSINESS PROCESS FUNDAMENTALS

Aug 26 Course Overview: Process Fundamentals

- Lecture Notes (LN): Process Intro & Mapping (Lecture notes are posted on Blackboard)
- Videos:
 - 1a. What is a business process? <https://www.youtube.com/watch?v=NXbGIIFidA>
 - 1b. Pitfalls of process mapping. <https://www.youtube.com/watch?v=RQSh2CyxdIA>
 - 1c. Process documentation. https://www.youtube.com/watch?v=L5co8_S9BeU
 - 1d. Cycle Time Improvement <https://www.youtube.com/watch?v=ZJvJfVBYza8>
- In Class Exercise: Mini-case: Kristen's Cookie Company, HBS 608037
 1. Prepare a flow chart of the operation.
 2. What is the bottleneck operation of the process?
 3. What is the total throughput time of the process to produce:
 - An order for one dozen cookies?
 - An order of two dozen cookies of the same type.
 - Two orders of one dozen cookies of different types?

Sept 2 Process Flowcharting (continued) and Learning Curve Analysis

- Read: "Process Analysis, Curriculum Core", by Roy Shapiro (# 8007 in HBSP readings)
- Learning Curve Analysis
 1. Read: Learning Curves, Chapter 4A, pp. 114-123.
 2. Read: LN Learning Curves
 3. Practice Problems: 1, 2, 3, 4, 5, 7, 8 and 9 at the end of Chapter 4A.
- Video: History of the Assembly Line <https://www.youtube.com/watch?v=bhyXFn74NUI>

Sept 9 Process Strategy and Product/Process Matrix

- Read: Manufacturing Processes (Ch. 6, pp. 166-178)
- Read: LN Manufacturing Process Types
- Read: "Great Nuclear Fizzle at Old B&W", Fortune Magazine, 1969. (posted on Blackboard)
 1. Prepare a time line of the major events discussed in the reading.
 2. What went wrong? Why?

Introduction to Assembly Lines

- Read: Assembly Line Design, (Ch. 6, pp. 178-183) Practice problems 19 & 20 on page 192.
- Read: LN Assembly Lines
- Video: Ford 150 Assembly Line <https://www.youtube.com/watch?v=ze4MZbyLnm8>

MODULE 2: MATCHING PRODUCT AND PROCESS DESIGN

Sept 16 Assembly Line Analysis and Breakeven Analysis

- Case: AIC Netbook: Optimizing Product Assembly (# 4245 in HBS reading packet)
Discussion Questions: Be prepared to discuss the following questions in class.
 1. How efficient is netbook assembly at the Kaizhi plant?
 - a. What is the monthly output of the plant?
 - b. What is the theoretical efficiency of the planned line, looking only at direct labor on the assembly line?
 - c. What is the actual efficiency of the assembly line?
 2. How effective is the current operation?
 - a. What is the right criteria by which to evaluate it?
 - b. Is the operation designed appropriately to meet demand?
 3. What is the financial impact of bringing the operation closer to planned production levels?
 - a. What is the planned production level in terms of monthly output?
 - b. What is the financial impact of achieving the target cycle time?
 - c. How important is reducing direct labor as a means to improve financial performance? (assume each assembly line worker costs \$500 per month)

Assignment due prior to start of class: Prepare a 1-2 page report to your hypothetical boss detailing your analysis of the efficiency of netbook assembly at the Kaizhi plan (see question 1a, b & c above) and the implications for the firm. A possible format is: brief problem definition/issues, evaluation, and recommendation, if any. You may work in pairs for this assignment and turn in a single report.

Breakeven Analysis

- Read: Break-even Analysis, Chapter 6 supplement, pp. 198-201
- Practice Problems: 1, 2 and 3 on page 201.
- Read: LN Breakeven Analysis

Sept 23 Process Analysis: Flow Systems

- Case Analysis: “National Cranberry Co-op” (#9-688-122 in HBSP reading packet)
Discussion Questions: Be prepared to discuss the following questions in class. To simplify your analysis, assume 18,000 barrels arrive each day, 70 % are wet harvested and the berries arrive at a uniform rate over a 12-hour period.
 1. Prepare a 1-2 sentence describing the problem facing the firm, the alternatives available to solve the problem, and the evaluation criteria for selecting from the alternatives.
 2. Prepare a process flowchart for the cooperative.
 3. What is the maximum daily throughput capacity of the cooperative?
 4. What alternatives are available to meet the wet berry processing requirements?
 5. What evaluation criteria should be used in selecting an alternative?
 6. What time do trucks start waiting to unload because the storage bins are full?
 7. What recommendations do you have for the coop?

Assignment due prior to the start of class: Turn in your answers to discussion questions 1, 2 and 3 at the start of class. Use Word, Power Point or another software product to prepare the flowchart. Label the throughput and storage capacity of each process. Identify the process bottleneck. You may work in pairs to complete this assignment and turn in a single report.

**** Sept 30 Exam 1. Covers all material since the start of the semester.**

Oct 7 Know Your Numbers! and Introduction to Service Systems

- **Video:** "Billionaire Buyer: I'm Betting on Y'all" (Season 1, Episode 1)
<https://www.youtube.com/watch?v=2OEDLe0oACk&list=PL6FTxz1hKdWd2YIAQUq015rOi0LVdJRgF&index=3&t=0s>
 - a. Macaron by Patisse: Product-Process-People
 - b. Bravado Spice (Liquor mixes) : Product-Process-People

Video Assignment due prior to the start of class (2 page maximum length)

For each firm, briefly answer the following questions.

- a. What problem must the vendor overcome in order to gain Tillman's business?
- b. What was Tillman's suggestion for overcoming the problem? When possible, run the numbers.
- c. Did they make a deal? Why? Why not? If not, was there a potential solution?

Introduction to Service Systems and Waiting Line Management

- Read: Ch. 7, Service Systems and Economics of Waiting Lines, pp. 202- 219
- Read: LN Waiting Lines

Oct 14 Waiting Line Management (continued) and Know Your Numbers!

Waiting Line Management (continued)

- Read: Ch. 7, Waiting Line Models, pp. 219-230
- **Video:** "Billionaire Buyer: Are You Jackin' With Me?" (Season 1, Episode 5)
<https://www.youtube.com/watch?v=0g19oPaTTEYY> (You may want to search for a better recording.)
 - a. Rossmore LA, (Jewelry)
 - b. Galanter & Jones, (Outdoor furniture)

Video Assignment due prior to the start of class. (2 page maximum length)

For each firm, briefly answer the following questions.

- a. What problem must the vendor overcome in order to gain Tillman's business?
- b. What was Tillman's suggestion for overcoming the problem? When possible, run the numbers.
- c. Did they make a deal? Why? Why not? If not, was there a potential solution?

Oct 21 Waiting Line Management (continued)

- Case Analysis: "Breakfast at the Paramount", HBS 9-617-011

Discussion Questions

1. What factors contribute to and detract from dine-in customers' service experiences waiting in line at the Paramount? How might Michael redesign the process to improve the experience?
2. Analyze the Paramount's seating policy. How does the seating policy contribute to the restaurant's capacity to serve customers? Why does it work? Know Your Numbers! (What is the bottleneck? process mapping, cycle time, capacity, and utilization are important)
3. Consider the M/M/1 queuing formulas shown in Exhibit 8, and calculate the length of the Paramount's line. What happens when the arrival rate (the number of customers arriving per hour) rises in relation to the service rate (the number of customers served per hour)? Know Your Numbers! Use the queuing worksheet to help analyze this question.
4. What advice do you have for Michael Conlon about how to respond to the increase in carryout orders at the Paramount?

Oct 28 Process Analysis: Just-in-Time and Lean Systems

- Read: Lean Supply Chains, Chapter 12.
- Read: LN Lean Systems
- Case: “Toyota Motor Manufacturing, U.S.A., Inc.,” HBS, 5-693-019

NOTE: The glossary of the case defines several important terms for understanding the case.

Discussion Questions.

1. As Doug Friesen, how would address the seat problem? Where would you focus your attention and solution efforts?
2. What options exist? What would you recommend? Why?
3. Where, if at all, does the current routine for handling defective seats deviate from the principles of the Toyota Production System?
4. What is the real problem facing Doug Friesen?

**** Nov 4 Exam 2. Covers all material since Exam 1**

MODULE 3: QUALITY MANAGEMNT AND PROCESS IMPROVEMENT

Nov 11 Establishing a Quality Attitude and Quality Management Systems

- Read: Quality Management, Chapter 10, (pp. 302-316, pp. 298-312)
- LN: Quality Management
- Mini-Case: “Hank Kolb, Director of Quality Assurance”, HBS 681083

Discussion Questions

- What are the causes of the quality problems on the Greasex line? Organize your answer by people, process and product.
- How should Hank address these problems?
- Videos: Process design and IT
 - 2a. How IT and Business Processes Fit Together (data management)
<https://www.youtube.com/watch?v=3iAp9me4P1c>
 - 2bc. Improving Business Process Handoffs (information flows)
https://www.youtube.com/watch?v=_2K-txcDteU

Nov 18 Process Capability and Statistical Process Control

- Read: Process Capability, Chapter 10, pp. 312-321. Problems 17-22 at end of the chapter.
- Read: Statistical Process Control, Chapter 10, pp. 321-329. Problems 23-26 at the end of the chapter.

Nov 25 – 29 Thanksgiving Holiday

Dec 2 Quality Management Systems and Course Wrap up

- Quality Management (continued)
- Videos: Process Improvement.
 - 3a. Process Improvement: Visibility <https://www.youtube.com/watch?v=65tgNkb5kN0>
 - 3b. Process Improvement: People <https://www.youtube.com/watch?v=OXHAVh7pEIM>
 - 3c. Process Improvement: Set Up for Success
<https://www.youtube.com/watch?v=DlsfCgONWNA>

**** Exam 3, December 9, Wednesday, covers all material since Exam 2.**