HMGT 6325 & OPRE 6325:
Healthcare Operations Management
(Check eLearning for the latest version)

Course number:	HMGT 6325.501 & OPRE 6325.501
Pre-requisites:	Please refer to coursebook.utdallas.edu
Meeting time:	Wednesday 4:00 pm - 6:45 pm
Meeting place:	Microsoft Teams
Instructor:	Nan Wang (Nan.Wang@UTDallas.edu)
Instruction Mode:	100% Online
Office Hour:	Wednesday 1:00 pm – 2:30 pm
Location:	Microsoft Teams

COURSE DESCRIPTION:

Operations Management studies the design and management of the processes that transform inputs into finished goods or services. Operations are a primary function of any organization. This course teaches various methods and techniques to improve healthcare operations, with a specific focus on utilizing analytical approaches to enhance healthcare processes. Topics include reducing patient wait times, measuring productivity, streamlining process flows, tracking outcomes and performance metrics, and improving health management processes. The level of analysis varies considerably, from operations strategy to daily control of business processes. The objective of this course is to equip students with the skills to actively participate in decision-making in healthcare management.

STUDENT LEARNING OBJECTIVES:

The student should be able to determine performance measures of manufacturing/service processes/systems in key operational dimensions. The student should also be aware of the factors that affect these measures, how they can be calculated, and how they can be improved. More specific objectives are as follows:

- Describe and explain services, manufacturing, just-in-time, and total quality management strategies.
- Derive and compute optimal decisions, and performance measures such as costs and profits.
- Develop analytical thinking in operations practices.

CAHME DOMAINS AND COMPETENCY MAPPING:

Domain 1: Communication and Relationship Management

- Present data analysis results to decision makers (course coverage: healthcare analytics, group project)

Domain 2: Leadership

- Critically analyze organizational issues after a review of the evidence (course coverage: process flow analysis)

Domain 5: Business Knowledge and Skills

- Demonstrate critical thinking and analysis (course coverage: inventory management, linear programming)
- Outcomes measure and management (course coverage: queueing theory, quality control)

HMGT 6325 HEALTHCARE OPERATIONS MANAGEMENT								
Program Goals	**PSLO**	**CSLO**	**Domain**	**Domain Name**	**Competency**	**Measure**	**How to Measure**	**Higher Level Learning**
Are prepared to be skilled decision-makers through comprehensive analysis of internal and external factors in healthcare environments. (PSLO 4)	Analyze how healthcare organizaitons create sustainable strategies to stay competitive	Describe and explain services, manufacturing, just in time, and total quality management strategies	1	Communication and Relationship Management	Present data analysis results to decision makers	Able to simplify analysis and recommendations for decision-makers	Group Project	No
Are prepared to be skilled decision-makers through comprehensive analysis of internal and external factors in healthcare environments. (PSLO 4)	Analyze how healthcare organizaitons create sustainable strategies to stay competitive	Derive and compute optimal decisions, and performance measures such as costs and profits	2	Leadership	Critically analyze organizational issues after a review of the evidence	Use systems-thinking and analytic methods to assess operations performance and improve organization processes	Homework Assignments and Tests; Process Improvement; Performance Evaluation	Yes
Are prepared to be skilled decision-makers through comprehensive analysis of internal and external factors in healthcare environments. (PSLO 4)	Analyze how healthcare organizaitons create sustainable strategies to stay competitive	Develop analytical thinking in operations practices	5	Business Knowledge and Skills	Demonstrate critical thinking and analysis	Understand the importance of crtiical thinking decision-making	Linear Programing & Inventory Mgmt	Yes
Are prepared to be skilled decision-makers through comprehensive analysis of internal and external factors in healthcare environments. (PSLO 4)	Analyze how healthcare organizaitons create sustainable strategies to stay competitive	Describe and model key supply chain processes, participants' roles, procedures, tools, technology, information systems, operational considerations, analytics, and best practices in healthcare setting	5	Business Knowledge and Skills	Outcomes and Measures	Develop a schedule, budget, and goals for a project and manage project resources to meet goals.	Homework Assignments and Tests: Queueing Theory and Quality Evaluation	Yes

COURSE RESOURCES:

MS Teams:

To join synchronous online classes, open MS Teams, click "OPRE 6325.0W1/HMGT 6325.0W1," and then click "Join." You may find the same link in your calendar. If you are unable to join the course room, you may try using the link in the class announcement. Please use your real name, so we know who is in the course room. If you experience issues accessing MS Teams, please contact the JSOM Help Desk at somtechs@utdallas.edu or call 972-883-5800.

Course Notes:

Before each lecture, a PDF version of the slides will be posted on eLearning. Most of the time, these slides will be incomplete, and you will be expected to fill in the blanks in class.

Assignments and Solutions:

Homework assignments will be posted at least three days before their due date. Solutions will be posted within one week of a homework assignment being graded.

Practice Problems:

Practice problems and solutions will be made available before the tests.

Grades:

Grades on assignments and tests will be posted on eLearning.

GRADING:

The course grades will be assigned based on the following points,

Category	Weight
Participation	5%
Group Project	15%
Homework	20%
Test 1	20%
Test 2	20%
Test 3	20%

Your final letter grade will be determined relative to your classmates.

Participation

Class participation is required. A portion of the grade for this course is directly tied to your participation, which may include engaging in group activities or others that solicit your feedback on questions, readings, or materials covered in the lectures. Students who fail to participate regularly in class invite scholastic difficulties. Using phones, laptops, or tablets for non-class-related activities or eating snacks is strictly prohibited and regarded as class disruption. Class participation and disruption are documented by faculty.

Successful participation is defined as consistently adhering to University requirements, as presented in this syllabus. Failure to comply with these University requirements violates the Student Code of Conduct (https://policy.utdallas.edu/utdsp5003). Specifically, you are expected to review the required materials before the corresponding session (see the Course Outline for details). You are expected to participate actively in class discussions. You are responsible for all material discussed and all course schedule changes announced during class.

Homework

Homework assignments are to be done individually. You need to download them from eLearning, write your answers (scan if necessary), and upload your answers to eLearning. The due dates for homework are always 11:59 pm on the next Tuesday. **One point deduction per minute for late submission under any circumstance**. The lowest assignment score will be dropped.

Please follow these conventions when submitting homework assignments: (1) use either pdf or Word, (2) name the documents as <Homework#>_<Name>.docx or <Homework#>_<Name>.pdf (e.g., Homework1_FirstName_LastName.pdf), and (3) arrange the pages in sequence.

Group Project

The purpose of the group project is for students to understand real-world healthcare issues and policies, apply techniques learned in this course, and present the results to stakeholders. Details about the topic and group formation will be announced in class. Each group will perform original data analyses, survey existing studies, or a combination of both. Peer evaluation will be conducted at the end of the course.

The group project has two deliverables:

- Project proposal (due 11:59 pm on 3/24) – Each group needs to submit one 1-2 page proposal. The proposal should include the names and Net IDs of group members and the following components: (1) background and significance, (2) study design and methods, and (3, optional) preliminary results and implications.
- Final Report (due 11:59 pm on 4/28) – Each group is required to submit a 3-5 page final report. The report should include the names and Net IDs of group members and the following components: (1) introduction, (2) methodology, (3) results, and (4) discussion.

Tests

All tests will be held via Honorlock. You will need Google Chrome and download the Honorlock Chrome Extension to get started. You must remain in front of the computer for the test duration (e.g., no bathroom breaks). To successfully take a test, you will need a web camera with a microphone, a laptop or desktop computer (not a tablet or phone), a Chrome browser, a reliable internet connection, and a valid photo ID.

Test 1 (2/18, 4 – 6 pm) covers the materials from sessions 1 through 3 (weeks 1 through 3). Test 2 (3/25, 4 – 6 pm) covers the materials from sessions 4 through 6 (weeks 6 through 8). Test 3 (4/29, 4 – 6 pm) covers the materials from sessions 7 through 9 (weeks 12 through 14). This course does not have comprehensive exams. Both tests are closed-book and closed-notes, but you are allowed to bring one A4-size handwritten double-sided help sheet. Do remember to bring your scratch paper, calculator, ruler, etc.

No alternative test will be offered except in a medical emergency, which requires a medical certificate from a physician. Missing a test without the instructor's pre-authorization will result in a zero score and no alternative test will be offered.

Any concern regarding the grading of tests should be addressed to both your instructor and your TA no later than three days after the grade is posted. We will review all your test answers, which may lead to an increase or decrease in your final grade.

COURSE POLICIES:

- One point deduction per minute for late homework submission under any circumstance.
- **No** alternative test will be offered, except in the event of a medical emergency (a certificate is required).
- **No** extra credit work will be given under any circumstances.
- The use of generative AI tools for homework assignments, group projects, or tests is not permitted.
- Academic dishonesty results in a score of zero for the corresponding work. In particular, cheating on a homework assignment results in a score of zero for the assignment; cheating on a test results in a score of zero for the test.
- Course materials and resources may **not** be reproduced or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. Failure to comply with these University requirements is a violation of the Student Code of Conduct (https://policy.utdallas.edu/utdsp5003).

UT DALLAS SYLLABUS POLICIES AND PROCEDURES:

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to http://go.utdallas.edu/syllabus-policies for these policies.

ACADEMIC SUPPORT RESOURCES:

See https://provost.utdallas.edu/syllabus-policies/#academic-support-resources for a list of the University's academic resources for all students.

STUDENT ACCESSIBILITY RESOURCES:

See https://studentaccess.utdallas.edu/ for a list of the University's academic resources for students with disabilities.

COVID-19 GUIDELINES AND RESOURCES:

See http://go.utdallas.edu/syllabus-policies for the University's COVID-19 resources.

COMET CREED:

The Comet creed was voted on by the The University of Texas at Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: "*As a Comet, I pledge honesty, integrity, and service in all that I do*."

TENTATIVE COURSE OUTLINE

Week	Date	Session-Topic	Homework	Group Project
1	1/21	1-Introduction & Process Flow Analysis I	0 & 1	
2	1/28	2-Process Flow Analysis II	2	
3	2/4	3-Process Flow Analysis III	3	
4	2/11	Review Session I (Weeks 1 – 3)		Self-enroll in a group
5	2/18	Test I (Weeks 1 – 3)		
6	2/25	4-Project Management	4	
7	3/4	5-Inventory Management	5	
8	3/11	6-Queueing Theory	6	
9	3/18	No Class: Spring Break		
10	3/25	Review Session II (Weeks 6 – 8)		Proposal due 3/24
11	4/1	Test II (Weeks 6 – 8)		
12	4/8	7-Linear Programming	7	
13	4/15	8-Healthcare Analytics	8	
14	4/22	9-Quality Control / Supply Chain	9	
15	4/29	Review Session III (Weeks 12 – 14)		Report due 4/28
16	5/6	Test III (Weeks 12 – 14)		

The descriptions and guidelines contained in this syllabus are subject to change at the discretion of the Professor. The latest version is available at eLearning.

OPTIONAL REFERENCE READING

All the material covered in the assignments and tests will be available on the slides. The books below are optional, although the first book is strongly recommended.

"Matching Supply with Demand: An Introduction to Operations Management" by Cachon, G. and C. Terwiesch. New York, NY: McGraw&Hill / Irwin, 3rd edition. ISBN: 978-0073525204.

"Healthcare Operations Management" by McLaughlin, B. and J. Olson. Chicago, IL: Health Administration Press, 3rd edition. ISBN: 978-1567938517.

"Fundamentals of Linear Optimization: A Hopefully Uplifting Treatment" by Topaloglu, H. The book is available at https://people.orie.cornell.edu/huseyin/lp_book.pdf.

"Health Care Supply Chain Management" by Ledlow, G., K. Manrodt, and D. Schott. Jones & Bartlett Learning, 1st edition. ISBN: 978-1284081855.

SESSION TOPIC	**OPTIONAL READING**
Introduction & Process Flow Analysis I	Cachon and Terwiesch 2.1, 2.2, 3.1, 3.2, 3.3
Process Flow Analysis II	Cachon and Terwiesch 3.4, 3.5, 4.1 to 4.4
Process Flow Analysis III	Cachon and Terwiesch 3.6, 7.1 to 7.3
Project Management	Cachon and Terwiesch 5.1 to 5.7
Inventory Management	Cachon and Terwiesch 2.3, 2.4, 7.6 and 7.7
Queueing Theory	Cachon and Terwiesch 8.1 to 8.6, 8.9
Linear Programming	Topaloglu Chapters 1-2
Healthcare Analytics	McLaughlin and Olson Chapter 7
Quality Control	Cachon and Terwiesch 10.1 to 10.5, Chapter 11
Supply Chain Management	Cachon and Terwiesch Chapter 17

STRATEGIES FOR SUCCESS

Workload Expectation

The key to success in this course is **PRACTICE**. You will have the opportunity to work on numerous practice problems. The university guidelines specify that you study at least two hours per week for every credit hour you are enrolled. Because this course is worth three semester credit hours, you should allocate **at least six hours** per week outside of class to prepare for and review class materials, complete homework assignments, work on group projects, and study for tests. Trimming this time input will diminish the value of the educational experience for everyone. Please recognize the importance of advance preparation, and begin now to level-load your course time input.

Class Preparation

The learning objectives, pre-class preparations, and post-class activities are outlined below. In and after each class, you will be expected to:

a. Be completely up to date with the materials covered so far. Many of the materials in this course build upon those taught earlier, so significant recall will be required.
b. Follow along with the professor as concepts are explained and examples are worked out on paper and using software.
c. Ask questions, contribute to class discussions, and be prepared to answer questions posted by the professor.
d. After class, review the covered materials thoroughly and refer to the optional textbooks or additional readings if necessary.

I understand you have limited time. However, I strongly urge you to devote adequate time to the course, as this is not material that can be covered in a day or two.

Homework

Because the weekly homework assignments are designed to improve your problem-solving skills further, they are usually more difficult than in-class examples and problems. I strongly encourage you to start working on these homework assignments early and submit them to eLearning on time. One point deduction per minute for late homework submission under any circumstance.

Group Project

You are strongly encouraged to actively participate and contribute to the group project and submit the deliverables on time. Peer evaluation may be conducted at the end of the course.

Tests

Each test will consist of quantitative questions related to the course materials and homework assignments. Practice problems and solutions will be provided to prepare you for the tests. The combination of course notes, homework assignments, and practice problems will fully prepare you to take the tests. Both tests will be held in the classroom. Students are responsible for ensuring they appear for the tests on time. No alternative test will be offered except in a medical emergency.

How to Get Help

In addition to my office hours, your TA will hold additional office hours for those who need help. This course moves rapidly. **DO NOT FALL BEHIND**! It is recommended that you see your TA or your professor **immediately for any difficulties**.

DETAILED SESSION SCHEDULE (TENTATIVE)

A session-by-session outline of the entire course is provided below, which includes the learning objectives, pre-class preparations, and post-class activities for each session. I will attempt to follow this schedule as closely as possible, although I reserve the right to modify it depending on the course's progress. Details about the textbooks are provided in other parts of the syllabus.

WEEK 1
1/21

INTRODUCTION AND PROCESS FLOW ANALYSIS I

Learning Objectives:

- Understand process views of organizations
- Understand the difference between manufacture and service processes
- Learn to draw a process flow diagram
- Learn to determine the capacity of a process

Preparation:

- Complete the JSOM Virtual Learning Launchpad at eLearning.
- Complete homework 0 and submit it to eLearning by 11:59 pm on 1/27.
- Read optional textbooks: Cachon and Terwiesch 2.1, 2.2, 3.1, 3.2, 3.3.
- Watch the optional video: Operations Management.

After Class:

- Complete homework 0 and 1 and submit them to eLearning by 11:59 pm on 1/27.
- Read optional textbooks: Cachon and Terwiesch 3.4, 3.5, 4.1 to 4.4.

WEEK 2
1/28

PROCESS FLOW ANALYSIS II

Learning Objectives:

- Understand batch process
- Learn how to calculate setup time, batch size, and capacity with setup
- Understand the mismatch between capacity and demand
- Learn to calculate flow rate, utilization, and labor cost

Preparation:

- Read optional textbooks: Cachon and Terwiesch 3.4, 3.5, 4.1 to 4.4.
- Watch the optional video: Shared Medical Appointments at Aravind Pondicherry.

After Class:

- Complete homework 2 and submit it to eLearning by 11:59 pm on 2/3.
- Read optional textbooks: Cachon and Terwiesch 3.6, 7.1 to 7.3.

WEEK 3 2/4

PROCESS FLOW ANALYSIS III

Learning Objectives:

- Understand theoretical flow time versus actual flow time
- Learn to draw inventory dynamics
- Determine waiting time based on inventory dynamics
- Determine the potential bottleneck from the utilization profile

Preparation:

- Read optional textbooks: Cachon and Terwiesch 3.6, 7.1 to 7.3.

After Class:

- Complete homework 3 and submit it to eLearning by 11:59 pm on 2/10.
- Read optional textbooks: Cachon and Terwiesch 5.1 to 5.7.
- Watch the optional videos: Project Network Diagrams and Project Acceleration.
- Self-enroll in a group project at eLearning by 11:59 pm on 2/10.

WEEK 4 2/11

REVIEW SESSION I

Learning Objectives:

- Review the materials from sessions 1-3 (weeks 1-3)
- Go through practice problems for test 1

Preparation:

- Prepare for test 1 by reviewing the lecture notes, homework, and practice problems for sessions 1-3 (weeks 1-3).

After Class:

- Read optional textbooks: Cachon and Terwiesch 8.1 to 8.6, 8.9.
- Read the optional article: The Poisson Distribution and Poisson Process Explained.
- Prepare for test 1 by reviewing the lecture notes, homework, and practice problems for sessions 1-3 (weeks 1-3).

WEEK 5
2/18

TEST I

Test 1 will be held via Honorlock from 4:00-6:00 pm on 2/18. It covers the materials from sessions 1-3 (weeks 1-3). The test is closed-book and closed-note, but you are allowed to bring one A4-size, handwritten, double-sided help sheet. Do remember to bring your calculator. Any electronics or communication among students during the test is strictly prohibited.

WEEK 6
2/25

PROJECT MANAGEMENT

Learning Objectives:

- Represent a project with a network diagram
- Compute the project duration and determine the critical activities
- Reduce the duration of the project in an economical way
- Learn to deal with randomness

Preparation:

- Read optional textbooks: Cachon and Terwiesch 5.1 to 5.7.
- Watch the optional videos: Project Network Diagrams and Project Acceleration.

After Class:

- Complete homework 4 and submit it to eLearning by 11:59 pm on 3/3.
- Read optional textbooks: Cachon and Terwiesch 2.3, 2.4, 7.6, and 7.7.

WEEK 7 3/4

INVENTORY MANAGEMENT

Learning Objectives:

- Understand holding cost and fixed cost
- Learn to calculate the optimal order quantity (EOQ)
- Learn to calculate lead time and reorder point
- Learn to calculate the reorder point under random demand
- Learn to calculate economic production quality (EPQ)

Preparation:

- Read optional textbooks: Cachon and Terwiesch 2.3, 2.4, 7.6, and 7.7.

After Class:

- Complete homework 5 and submit it to eLearning by 11:59 pm on 3/10.

WEEK 8
3/11

QUEUEING THEORY

Learning Objectives:

- Understand variability causes queues
- Learn process performance measures
- Learn Little's Law and its applications
- Solve waiting problems in practice

Preparation:

- Read optional textbooks: Cachon and Terwiesch 8.1 to 8.6, 8.9.
- Read the optional article: The Poisson Distribution and Poisson Process Explained.

After Class:

- Complete homework 6 and submit it to eLearning by 11:59 pm on 3/17.
- Read optional textbooks: Topaloglu Chapters 1-2.
- Install the Solver Add-in by reading the instruction and watching the video.
- Prepare for test 2 by reviewing the lecture notes, homework, and practice problems for sessions 4-6 (weeks 6-8).
- Submit a group project proposal to eLearning by 11:59 pm on 3/24.

WEEK 9 3/18

NO CLASS

WEEK 10 3/25

REVIEW SESSION II

Learning Objectives:

- Review the materials from sessions 4-6 (weeks 6-8)
- Go through practice problems for test 2

Preparation:

- Prepare for test 2 by reviewing the lecture notes, homework, and practice problems for sessions 4-6 (weeks 6-8).

After Class:

- Read optional textbooks: Cachon and Terwiesch 8.1 to 8.6, 8.9.
- Read the optional article: The Poisson Distribution and Poisson Process Explained.
- Prepare for test 2 by reviewing the lecture notes, homework, and practice problems for sessions 4-6 (weeks 6-8).

WEEK 11

4/1

TEST II

Test 2 will be held via Honorlock from 4:00-6:00 pm on 4/1. It covers the materials from sessions 4-6 (weeks 6-8). The test is closed-book and closed-note, but you are allowed to bring one A4-size, handwritten, double-sided help sheet. Do remember to bring your calculator. Any electronics or communication among students during the test is strictly prohibited.

WEEK 12 4/8

LINEAR PROGRAMMING

Learning Objectives:

- Identify decision variables
- Learn to write the objective function and constraints
- Understand optimal solutions and feasible solutions
- Learn to solve a linear programming (LP) problem graphically
- Learn to use Excel Solver to solve an LP problem

Preparation:
- Read optional textbooks: Topaloglu Chapters 1-2.
- Install the Solver Add-in by reading instruction and watching video.
- Bring your laptop with the Solver Add-in to the class.

After Class:
- Complete homework 7 and submit it to eLearning by 11:59 pm on 4/14.
- Read optional textbooks: McLaughlin and Olson, Chapter 7.

WEEK 13
4/15

HEALTHCARE ANALYTICS

Learning Objectives:
- Learn the simple linear regression model
- Learn to use Excel to solve a regression problem
- Learn the multiple regression model
- Understand the general linear model

Preparation:
- Read optional textbooks: McLaughlin and Olson Chapter 7.
- Install the Analysis ToolPak in Excel by reading the instruction and watching the video.
- Bring your laptop with the Analysis ToolPak to the class.

After Class:
- Complete homework 8 and submit it to eLearning by 11:59 pm on 4/21.
- Read optional textbooks: Cachon and Terwiesch 10.1 to 10.5, Chapters 11 and 17.

WEEK 14
4/22

QUALITY CONTROL / SUPPLY CHAIN

Learning Objectives:
- Understand variability in quality
- Determine whether a process is in control
- Measure a process's performance in quality
- Understand the bullwhip effect in the supply chain

Preparation:
- Read optional textbooks: Cachon and Terwiesch 10.1 to 10.5, Chapters 11 and 17.

After Class:

- Complete homework 9 and submit it to eLearning by 11:59 pm on 4/28.
- Submit a group project final report to eLearning by 11:59 pm on 4/28.
- Prepare for test 3 by reviewing the lecture notes, homework, and practice problems for sessions 7-9 (weeks 12-14).

WEEK 15 4/29

REVIEW SESSION III

Learning Objectives:

- Review the materials from sessions 7-9 (weeks 12-14)
- Go through practice problems for test 3

Preparation:

- Prepare for test 3 by reviewing the lecture notes, homework, and practice problems for sessions 7-9 (weeks 12-14).

After Class:

- Prepare for test 3 by reviewing the lecture notes, homework, and practice problems for sessions 7-9 (weeks 12-14).

WEEK 16

5/6

TEST III

Test 3 will be held via Honorlock from 4:00-6:00 pm on 5/6. It covers the materials from sessions 7-9 (weeks 12-14). The test is closed-book and closed-note, but you are allowed to bring one A4-size, handwritten, double-sided help sheet. Do remember to bring your calculator. Any electronics or communication among students during the test is strictly prohibited.