



<b>Course</b>	<b>OPRE 6V99.002: Special Topics in Operations Research OPERATIONS ANALYTICS</b>
<b>Professor</b>	A. Serdar Simsek
<b>Term</b>	Spring 2017
<b>Meetings</b>	Tuesday 4:00pm-6:45pm, JSOM 12.218

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### **PROFESSOR'S CONTACT INFORMATION**

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<b>Office Hours</b>	Wednesday 3pm-4:30pm, or by appointment
<b>Other Information</b>	Please include "OPRE 6V99" in the title of your email to ensure my timely response.
<b>TA</b>	Xi Shan
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<b>TA Office Hours</b>	TBA

### **GENERAL COURSE INFORMATION**

<b>Pre-Requisites</b>	OPRE 6302 Operations Management.
<b>Course Description</b>	All businesses face operational and pricing challenges including: how to configure and operate their supply chain, what inventory levels to carry at various points in the supply chain, how to allocate products to sales channels and outlets, how to price their products over time to different market segments. These challenges are often addressed individually and in isolation but, in reality, all of these decisions interact with each other at a fundamental level. This class looks at the operations management challenges faced by companies in various industries through business cases and analytics exercises. We pay particular attention to incorporating data-driven decision making into companies' complex processes and the challenges involved in coordinating different decision areas across the firm.
<b>Learning Outcomes</b>	On successful completion of this course, a student will be able to (i) understand the complexity of and the interaction between various operational challenges faced by companies, (ii) develop a better understanding of current use of analytics in operations management, and (iii) identify relevant data, analyze it, and appropriately incorporate it in the companies' decision making process.
<b>Required Texts &amp; Materials</b>	<ul style="list-style-type: none"><li>Phillips, R. L. (2005) Pricing and Revenue Optimization (Stanford University Press, Palo Alto, CA).</li></ul> <p>You will need to purchase the required text. There are two purchasing options:</p> <p>Option 1: UTD Bookstore</p>

Option 2: <https://www.amazon.com/Pricing-Revenue-Optimization-Robert-Phillips/dp/0804746982/>

**Other Texts,  
Readings &  
Materials**

Other materials and lecture notes will be posted on eLearning.

If students would like to read another textbook, the following is recommended:

- (Optional) Bodea, T. and Ferguson, M. (2014) Segmentation, Revenue Management and Pricing Analytics (Routledge, 1<sup>st</sup> edition)
- (Optional) Ozer, O. and Phillips, R. L. (2012) Oxford Handbook of Pricing Management (Oxford University Press)

The required textbook, lecture notes, and other materials posted on eLearning should be sufficient for the students to learn the material. These optional textbooks are not required.

## **COURSE POLICIES**

**Course Format**

Classes will include a mixture of lectures, case discussions, published articles, student participation, and class presentation by students. The textbook and readings articles will provide the basis for lectures on various operations analytics topics. Students will be evaluated based on a mid-term exam, final project report and presentation, group case analysis and presentation, and in-class participation.

Lecture notes will be provided electronically via eLearning. Lecture notes are meant only for students who register for this course and will not be provided to students who are not registered. Students are expected to come prepared for the assigned readings prior to class.

**Grading  
(credit) Criteria**

**The total score (100 points) will be made up of five parts. I reserve the right to use my discretion to make minor adjustments on this distribution based on class enrollment. I will finalize the grading criteria once class add/drop process is over.**

- **Group case analysis and presentation (25%).**

The class will be split into several groups. Each group will present assigned case(s) in class. Case analysis and presentation is a group effort, and each group presentation should be approximately 25-30 minutes in duration. Each team will submit its presentation/analyses in the PowerPoint format to the Instructor at the eLearning submission page before the class. The schedule for case presentations will be provided in class once teams are finalized. Non-presenting teams are also responsible for 1) answering the case-related questions, and 2) preparing a question to be asked to the presenting team. In summary:

Presenting Group will

1. Submit a powerpoint file at eLearning that analyzes the case and answers the questions posed by the instructor (if any).
2. Present the case in class

All the Non-presenting Groups will

1. Answer questions assigned by the instructor (at eLearning) (if any)

2. In the same submission page, provide a question to be asked to the presenting group

See the “Group Cases” section for how to analyze the cases.

- **Individual assignments (15%).**

There will be two–four homework assignments throughout the course. You must turn in your own assignments. Each HW assignment is due by the class start time unless indicated otherwise. Assignments have to be submitted via the eLearning website. **Emailed assignments will not be accepted.** Late submissions will be penalized by 20% of the individual homework grade at the initial few hours and will not be accepted beyond the midnight the same day. If you are not in class when the assignment is given, it is your responsibility to check the elearning for the assignment. More details will be provided in class.

- **Midterm exam (30%).**

There will be an in-class midterm exam. Students will be tested on the course material taught until that time.

- **Course Project (20%).**

The class will be split into groups. Each group will be responsible for selecting a project on applying analytics to an operations problem, presenting their findings to the class, and submitting a final report. There will be milestones for the project progress and groups will present their progress as indicated in the course schedule. The project may pertain to any topic related to operations **where analytics techniques are applied using data**. Students may choose to work on a real life problem, possibly collaborating with an organization, or acquire data from publicly available resources and identify a research problem. The instructor must approve the project that is selected for analysis before the group can proceed with developing the analysis. “We could not find a project to work on” or “we could not find data” will not be accepted as an excuse for delays in project progress. Group members will evaluate each other at the end of the semester. It is at the Professor’s discretion to how these evaluations will be used in case there is a strong negative evaluation on a group member.

- **Class participation (10%).**

Class attendance is highly encouraged. There will be 5-minute pop quizzes at the **beginning** of some randomly selected classes. These quizzes will not be graded and will be used only for the purpose of attendance record. If you must miss a class because of an emergency you will have to contact the professor in advance for permission and provide proof, and you may need to meet with the professor individually to make up the class. You are also expected to actively participate in the discussion of topics, cases and readings, and contribute to the learning experience of the class. Active participation includes asking questions about the lecture content when it is not clear to you and answering the questions the professor asks in class. I will occasionally use cold calls to increase the participation level. I reserve

the right to use my discretion in class participation score based on your “active participation”.

**Letter grade**

You will be evaluated relative to your classmates.

**Group Cases** The class will be divided into teams. Five - six cases (depending on class enrollment) will be used during the course of the semester for group case analyses and presentation. Four of these cases will be available at the Columbia CaseWorks and Harvard Business Publishing websites and students will need to purchase them from these websites using unique links that will be provided on eLearning. I will distribute the remaining two cases.

Following website provide some guidance on how the case can be analyzed. I will provide instructions on case analysis as we progress in the class.

<http://college.cengage.com/business/resources/casestudies/students/analyzing.htm>

**Make-Up Exams** **NO** make-up exam will be offered except in case of medical emergency (proof required).

**Extra Credit** Extra credit will **NOT** be offered.

**Late Work** **NO** late assignments will be accepted except in case of medical emergency (proof required) unless indicated otherwise.

**Class Attendance**

- You are expected to actively participate in the class. See “Strategies for Success” below on “Participation” for more details.
- You are expected to read the textbook chapters, cases and other required materials prior to the corresponding class lecture (required and optional reading materials will be posted on eLearning prior to each class).

- You are responsible for all materials discussed and all course schedule changes announced during class.

**Classroom Citizenship**

- Class begins on time. Please maintain class decorum and be respectful toward fellow students in the class. If you have a doubt or misunderstanding regarding course work feel free to discuss it with me.

- Using your phone during class is not permitted and is rude. Keep your phone on silent at all times and away from your desk. This includes no texting. Offenders will be asked to turn off their phones.

- Laptop computer policy: I will announce in advance when the students are encouraged to bring a laptop to class. Using a laptop in these lectures (for the purpose of obtaining the numbers) is permitted. All other features and their usage (such as e-mail, internet, games, and instant messenger) are **strictly prohibited** and regarded as class disruptions.

- These rules will be enforced.

**Accessibility Accommoda-** It is the policy and practice of the University of Texas at Dallas to make reasonable accommodations for students with properly documented

**tions** disabilities. However, written notification from the Office of Student AccessAbility (OSA) is required. If you are eligible to receive an accommodation and would like to request it for this course, please discuss it with me and allow one week advance notice. Students who have questions about receiving accommodations, as well as those who have or think they may have, a disability (mobility, sensory, health, psychological, learning, etc.) are invited to contact the Office of Student Access Ability for a confidential discussion. OSA is located in the Student Services Building, suite 3.200. They can be reached by phone at (972) 883-2098, or by email at [studentaccess@utdallas.edu](mailto:studentaccess@utdallas.edu).

**Software** The course will involve extensive use of Microsoft Excel, and in particular the data-analysis tool pack (a native Excel add-in). The use of each tool will be discussed in class but basic familiarity (such as copy and paste, entering formulae) with Microsoft Excel is assumed. We will also use the Premium Solver add-in of Excel for some case studies. This Excel add-in is available in 12.101 lab computers.

I expect that students will use Excel 2010 or 2013 (preferred). In case some students may have laptops with Office 2007, the lecture notes, classroom demonstrations, and screen shots will utilize features common for all versions of Excel.

**Mac Support** Microsoft Office 2011 for Mac does NOT have the same statistical tools that Office 2013 for Windows has. In particular, Office for Mac does not have regression tools. I recommend that students with Mac install Microsoft Office for Windows. As a UTD student, you are eligible to buy a student version at a deeply discounted price: check with the university technology store.

**Religious Holy Days** The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

## **STRATEGIES FOR SUCCESS**

### **1. Class preparation:**

The main topics, reading assignments, and suggested problems will be posted on eLearning. In each class you will be expected to:

- a) Complete required readings and skim lecture notes (prior to class).
- b) Read the relevant case studies (if any) and be ready to discuss it in class.
- c) Print a hardcopy of the lecture notes for each class and bring it with you to take additional notes.
- d) Read the appropriate portions of the textbook (before and after class).
- e) Bring a **nameplate** to every class.

I understand that you have limited time. However, I strongly urge you to devote adequate time to the course since this is not material you can cram over a day or two. If you are pressed for time for specific classes, prioritize your class preparation in the order given above.

### **2. Class participation:**

Please bring your **nameplate** to every class. The nature of the contributions students can make in class depends on whether we are covering basic tools, or asking for managerial conclusions. Excellent participation in this course means helping the entire class with salient questions, contributions, or clarifications. Less than excellent participation would include *disruptive entrances/departures, causing distraction to yourselves, colleagues, and instructors by inappropriate use of your laptop or cellphone, and/or taking class time to ask for information that would be redundant for students properly prepared for class.*

### **3. How to get help:**

In addition to my office hours, a TA will be available for additional office hours for those students who need help. This course is cumulative and moves rapidly. **DO NOT FALL BEHIND!** It is recommended that you see your instructor **immediately for any difficulties.**

## **TENTATIVE COURSE OUTLINE AND ASSIGNMENTS & EXAMS CALENDAR**

I will attempt to stick to this schedule as much as possible, although I reserve the right to modify the lecture contents and homework due dates depending on the evolution of the course. Sufficient notice will be given for any changes.

### **ORPE 6V99.002 Spring 2017 Course Outline**

<b>Week</b>	<b>Date</b>	<b>Lecture Topics</b>	<b>Cases</b>
1	Jan 10	Course overview and introduction to operations analytics – Price optimization I	
2	Jan 17	Price optimization II – Nonlinear Pricing	
3	Jan 24	Markdown management – Regression Analysis	Personal Training at the New York Health Club (A)
4	Jan 31	Choice modeling and assortment optimization	Markdown Pricing Optimization at Bloomingdale's (A)
5	Feb 7	Customized pricing	Personal Training at the New York Health Club (B)
6	Feb 14	Evaluating Logistic Models – Pricing with strategic customers	Fleet Sales Pricing at Fjord Motor
7	Feb 21	Behavioral economics and pricing – course review	
8	Feb 28	<b>MIDTERM EXAM</b>	
9	Mar 7	Introduction to supply analytics – Inventory Management I	
	Mar 14	<b>NO CLASSES: Spring break</b>	
10	Mar 21	Inventory Management II	Scientific Glass, Inc.
11	Mar 28	Inventory in multi-echelon supply chains – Supply chain design	
12	Apr 4	Supply chain design: Facility location problem	RestA Mattress Company (A)
13	Apr 11	Case Analysis: RestA Mattress Company	RestA Mattress Company (B)
14	Apr 18	Course review and project presentations	
15	Apr 25	Project presentations	

## **ACADEMIC INTEGRITY**

The faculty and administration of the School of Management expect from our students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work. We want to establish a reputation for the honorable behavior of our graduates, which extends throughout their careers. Both your individual reputation and the school's reputation matter to your success.

The Judicial Affairs website lists examples of academic dishonesty. Dishonesty includes, but is not limited to cheating, plagiarism, collusion, facilitating academic dishonesty, fabrication, failure to contribute to a collaborative project and sabotage. Some of the ways students may engage in academic dishonesty are:

- Coughing and/or using visual or auditory signals in a test;
- Concealing notes on hands, caps, shoes, in pockets or the back of beverage bottle labels;
- Writing in blue books prior to an examination;
- Writing information on blackboards, desks, or keeping notes on the floor;
- Obtaining copies of an exam in advance;
- Passing information from an earlier class to a later class;
- Leaving information in the bathroom;
- Exchanging exams so that neighbors have identical test forms;
- Having a substitute take a test and providing falsified identification for the substitute;
- Fabricating data for lab assignments;
- Changing a graded paper and requesting that it be regraded;
- Failing to turn in a test or assignment and later suggesting the faculty member lost the item;
- Stealing another student's graded test and affixing one's own name on it;
- Recording two answers, one on the test form, one on the answer sheet;
- Marking an answer sheet to enable another to see the answer;
- Encircling two adjacent answers and claiming to have had the correct answer;
- Stealing an exam for someone in another section or for placement in a test file;
- Using an electronic device to store test information, or to send or receive answers for a test;
- Destroying or removing library materials to gain an academic advantage;
- Consulting assignment solutions posted on websites of previous course offerings;
- Transferring a computer file from one person's account to another;
- Transmitting posted answers for an exam to a student in a testing area via electronic device;
- Downloading text from the Internet or other sources without proper attribution;
- Citing to false references or findings in research or other academic exercises;
- Unauthorized collaborating with another person in preparing academic exercises.

- Submitting a substantial portion of the same academic work more than once without written authorization from the instructor.

<http://www.utdallas.edu/judicialaffairs/UTDJudicialAffairs-Basicexamples.html>

## **PLAGIARISM**

Plagiarism on written assignments, especially from the web, from portions of papers for other classes, and from any other source is unacceptable. On written assignments, this course will use the resources of turnitin.com, which searches the web for plagiarized content and is over 90% effective.

## **CONDUCT DURING COURSE EXAMS**

During tests and quizzes, students in this section are not allowed to have with them any food and drinks. When possible, students should sit in alternating seats, face forward at all times, and remove any clothing which might conceal eye movements, or reflect images of another's work. Exam proctors will monitor any communication or signaling between students by talking, whispering, or making sounds, or by using your hands, feet, other body movements, the test paper itself, your writing implement.

## **ACADEMIC DISHONESTY**

Students in this course suspected of academic dishonesty are subject to disciplinary proceedings, and if found responsible, the following minimum sanctions will be applied:

- **Homework – Zero for the Assignment**
- **Quizzes – Zero for the Quiz**
- **Presentations – Zero for the Assignment**
- **Group Assignments – Zero for the Assignment for all group members**
- **Exams – Zero for the Exam and a one letter grade reduction of the final course grade**

These sanctions will be administered only after a student has been found officially responsible for academic dishonesty, either through waiving their right for a disciplinary hearing, or being declared responsible after a hearing administered by Judicial Affairs and the Dean of Student's Office.

In the event that the student receives a failing grade for the course for academic dishonesty, the student is not allowed to withdraw as a way of preventing the grade from being entered on their record. Where a student receives an F in a course and chooses to take the course over to improve their grade, the original grade of F remains on their transcript, but does not count towards calculation of their GPA.

The School of Management also reserves the right to review a student's disciplinary record, on file with the Dean of Students, as one of the criteria for determining a student's eligibility for a scholarship.

## **JUDICIAL AFFAIRS PROCEDURES**

Under authority delegated by the Dean of Students, a faculty member who has reason to suspect that a student has engaged in academic dishonesty may conduct a conference with the student in compliance with the following procedures:

1. the student will be informed that he/she is believed to have committed an act or acts of academic dishonesty in violation of University rules;

2. the student will be presented with any information in the knowledge or possession of the instructor which tends to support the allegation(s) of academic dishonesty;
3. the student will be given an opportunity to present information on his/her behalf;
4. after meeting with the student, the faculty member may choose not to refer the allegation if he/she determines that the allegations are not supported by the evidence; or
5. after meeting with the student, the faculty member may refer the allegations to the dean of students along with a referral form and all supporting documentation of the alleged violation. Under separate cover, the faculty member should forward the appropriate grade to be assessed if a student is found to be responsible for academic dishonesty;
6. the faculty member may consult with the dean of students in determining the recommended grade;
7. the faculty member must not impose any independent sanctions upon the student in lieu of a referral to Judicial Affairs;
8. the faculty member may not impose a sanction of suspension or expulsion, but may make this recommendation in the referral documentation

If the faculty member chooses not to meet with the student and instead forwards the appropriate documentation directly to the dean of students, they should attempt to inform the student of the allegation and notify the student that the information has been forwarded to the Office of Dean of Students for investigation.

The student, pending a hearing, remains responsible for all academic exercises and syllabus requirements. The student may remain in class if the student's presence in the class does not interfere with the professor's ability to teach the class or the ability of other class members to learn. (See Section 49.07, page V-49-4 for information regarding the removal of a student from class).

Upon receipt of the referral form, class syllabus, and the supporting material/documentation from the faculty member, the dean shall proceed under the guidelines in the Handbook of Operating Procedures, Chapter 49, Subchapter C. If the respondent disputes the facts upon which the allegations are based, a fair and impartial disciplinary committee comprised of UTD faculty and students, shall hold a hearing and determine the responsibility of the student. If they find the student in violation of the code of conduct, the dean will then affirm the minimum sanction as provided in the syllabus, and share this information with the student. The dean will review the student's prior disciplinary record and assess additional sanctions where appropriate to the circumstances. The dean will inform the student and the faculty member of their decision.

### **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.

*The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor. Please check the course eLearning website regularly for following the announcements during the semester regarding such possible changes.*