Please note: This is a preliminary syllabus and is subject to change. It provides useful introductory detail and additional course insight as you prepare for the application process.

OID A:

Prescriptive Analytics: Making Business Decisions using Optimization and Simulation

Course Details

Instructor:	Tan Lekwijit	Course Dates:	March 15-April 29, 2021
Office Hours:	TBD (online)	Meeting Days:	TBD
Term:	Spring 2	Meeting Times:	TBD (posted in EST)

Course Description & Objectives

In this course, we will explore the subject of quantitative business decision making. Specifically, we will study optimization and simulation tools and provide you with a set of key skills in the area of prescriptive analytics. We will illustrate the use of these tools in a variety of business applications, including manufacturing, logistics, inventory management, capital budgeting, insurance, and revenue management.

The course assumes no specific mathematical background beyond basic algebra and probability concepts. Familiarity with the basic functioning of Excel is helpful, but not required as we will introduce and review the Excel skills as needed. No prior experience with programming or statistics is expected.

Course Overview

Each week, the course will have two class sessions.

The first session is an online, pre-recorded video lecture where the professor will cover the modeling concepts and examples of their use. The recording of each lecture will be posted at 10:30am EST on the days indicated in the course schedule below.

The second session, a "recitation," will reinforce the concepts introduced in the week's lecture. Recitations will be held at 10:30am EST on the days indicated in the course schedule below and will last 90 minutes. Each recitation will be divided into two halves: during the first half the instructor will work through an additional example of the concept introduced in lecture, and during the second half you will complete a "recitation exercise" that will be graded.

Course Materials

Online:
The course Canvas site will be the source for all class materials and assignments. In particular, lecture recordings and accompanying slides and Excel files, as well as recitation materials, will be posted on Canvas.

Software:

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In this course we will use Excel, and, in particular, two "add-ins" that are built into Excel: "Solver" and "Data Analysis."

Course Content & Schedule

Week	Topic	Lecture	Recitation	Assignment
1	Introduction to Optimization	March 16	March 19	A1: distributed March 16
2	Linear Network Models with Applications to Logistics and Inventory Management	March 23	March 26	
3	Sensitivity Analysis: Answering "What if" Questions	March 30	April 2	A1: due March 30 A2: distributed March 30
4	Linear Optimization with Integer Variables: Capital Budgeting Example	April 6	April 9	
5	Introduction to Simulation: Evaluating Medical Insurance Plan	April 13	April 16	A2: due April 13 A3: distributed April 13 A3: due April 27
6	Using Simulation to Make Business Decisions: Revenue Management Example	April 20	April 23	

Assessments & Grading

Your final score will be determined by your performance on graded assignments, recitation exercises, and the final exam, with the following weights:

	% of total
1. Three graded assignments	20
2. Recitation Exercises	20
3. Final Exam	60

Your final score will be normalized to 100 points, and your course grade will be calculated as follows:

Normalized Score Interval (out of 100)	Course Grade
[95, 100)	A+

[85, 95)	A
[80, 85)	A-
[75, 80)	B+
[70,75)	B
[65,70)	B-
[60, 65)	C+
[0, 60)	C or lower

We will not round final scores to determine your grade.

Assignments:

There will be three graded assignments during this course. The questions on these assignments are similar in nature to the questions you can expect to see on the final exam. While completing these assignments, you are allowed to collaborate with other students registered this semester in our course. However, each student must submit their own assignment.

All assignments are due by 11:30 p.m. EST of the assigned due date (see the course schedule below). Late assignments are not accepted, even for partial credit. You must submit your assignments electronically via Canvas.

Final Exam:

Your final exam will be delivered in the form of a 2-hour Canvas quiz (date and time to be announced later).

During your final exam, you may not communicate with anyone and you may only use class materials posted on Canvas. You may use a calculator (which includes graphing or programmable calculators) during the exam. However, you may not use any electronic device that can run Excel or communicate with another electronic device.