FE 501 Optimization Models in Economics and Finance

Fall 2020, Ilhan OR

Course Description

Overview of optimization concepts: examples from linear programming, non-linear programming, and integer programming. Linear programming: modeling, solution procedures, duality, sensitivity analysis; economic interpretations. Integer Programming: modeling possibilities through integer variables; solution procedures. Nonlinear Programming: modeling possibilities, unconstrained & constrained cases.

Modeling-analysis-decision loop in financial and economic practice; modeling and treatment of risk; applications in finance and economics; applications in portfolio management; realistic examples from finance by using of linear and nonlinear programming software.

Course Outline

1.	Week Oct. 28	Introduction; Linear Optimization: Basics
2.	Week Nov. 04	Linear Optimization: Applications to Finance & Economics.
3.	Week Nov. 11	Duality and Sensitivity.
4.	Week Nov. 18	Integer - Optimization: Basics; Appl. to Fin. & Econ.
6.	Week Nov. 25	Nonlinear Optimization: Basics &Applications.
7.	Week Dec. 02	Excel-Solver; GAMS Optimization Package.
7.	Week Dec. 09	Intro Mean-Variance Portfolio Theory.
8.	Week Dec. 16	Delineating Efficient Portfolios.
9.	Week Dec. 23	Techniques for Calculating the Efficient Frontier.
10.	Week Dec. 30	General Mean-Variance Portfolio Model with Constraints. The Single Index Model.
11.	Week Jan. 06	The Single Index Model.
12.	Week Jan. 13	General Modeling & Treatment of Risk.
13.	Week Jan. 20	

Textbook

- Modern Portfolio Theory & Investment Analysis (E. Elton, M. Gruber, S. Brown, W. Goetzmann, 9th Ed., 2017)
- Operations Research, Lecture Notes (Ilhan Or, 2018)

References

- Operations Research, An Introduction (H. Taha, Prentice Hall, 10th Ed., 2017)

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WebPage: https://moodle.ie.boun.edu.tr/course/view.php?id=44 Enrollment Key: FE501Fall2020

Grading

Homework Assignments 30 %; Final Exam 70 %

Class Hours/Classroom: WWW 11 12 13; MF/VYKM 4

Course Structure and Basic Information:

- Throughout the course there will be 3 hours of lectures per week.
- The topics to be covered are announced in the Syllabus.
- We will have a teaching assistant, he will grade the homeworks, manage the course Moodle website and deliver 1-2 problem/application sessions via zoom.
- In all lectures, I will use my own lecture notes.
- All lectures, assignments and other documents will be uploaded to the course Moodle Site. The students may download all course material at will.
- Course evaluations will depend on 1 final and 7-8 homework assignments.
- The final exam is expected to be held in-class. One A4 size formula sheet will be allowed in the in-class final exam (written in student's own handwriting).
- I will communicate with you (exam dates, homeworks, announcements etc.) through your e-mail addresses registered at the registerers office and through the course Moodle Site. Make sure that address is up to date.

Course Delivery:

- The course delivery will be fully on-line and real time via the University's "Zoom System". Recordings of the lectures will not be available.
- My office hours will be on-line via Zoom and e-mail; the teaching assistant will not hold office hours. However, he will be available (regarding homework assignments) via e-mail and zoom.
- Every student is expected to have access to a camera equipped computer and to internet during class hours.
- The final exam is expected to be held in class.