COURSE DETAIL

MATHEMATICAL PROGRAMMING IN ADVANCED ANALYTICS

Country
United Kingdom - Scotland

Host Institution
University of Edinburgh

Program(s)
University of Edinburgh

UCEAP Course Level
Upper Division

UCEAP Subject Area(s)
Mathematics

UCEAP Course Number
101

UCEAP Course Suffix

UCEAP Official Title
MATHEMATICAL PROGRAMMING IN ADVANCED ANALYTICS

UCEAP Transcript Title
MATH PRGMG & ANLYTC

UCEAP Quarter Units
8.00

UCEAP Semester Units
5.30

Course Description

Optimization problems are concerned with optimizing an objective function subject to a set of constraints. When optimization problems are translated in algebraic form, we refer to them as mathematical programs. Mathematical programming, as an area within Operational Research (OR), Management Science (MS) and Business Analytics (BA), is concerned with model building and strategies and methods for solving mathematical programs. In this course, we address model building in OR/MS/BA, present a variety of typical OR/MS/BA problems and their mathematical programming formulations, provide general tips on how to model managerial situations, and discuss solution strategies for a class of deterministic and/or under uncertainty problems. Last, but not least, students will learn how to use/build prescriptive analytics tools in the context of decision problems faced by business managers. The four main topics covered in this course are: Syllabus 1. Introduction to OR/MS and Model Building; 2. Linear Programming (LP): Review of basic concepts and methods; namely, the simplex method and the dual simplex method, sensitivity analysis, and duality theory; 3. Integer Programming (IP): Basic concepts, relationship with linear programming, strategies and methods of solving integer programs; namely, brand-and-bound algorithms, cutting plane algorithms, and brand-and-cut algorithms; 4. Optimization under Uncertainty: Basic concepts in two-stage stochastic programming and robust optimization, relationship with deterministic equivalent formulations, and applications.

Language(s) of Instruction

English

Host Institution Course Number

BUST10134

Host Institution Course Title

MATHEMATICAL PROGRAMMING IN ADVANCED ANALYTICS

Host Institution Campus

University of Edinburgh

Host Institution Faculty

Host Institution Degree

Host Institution Department
Business Studies

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