

Advanced Operations Research (OR3)

Approximate Syllabus – DIW Masterclass

Monday 17 June (Instructor: Prof. Dr. Sauleh Siddiqui)

Morning: Optimality conditions for constrained problems: Karush-Kuhn-Tucker (KKT) conditions (will be seen as special case for mixed complementarity problems)

Afternoon: Definition of (mixed) complementarity problems and variational inequalities, producer duopoly, GAMS exercises

Tuesday 18 June (Instructor: Prof. Dr. Sauleh Siddiqui)

Morning: Wardrop traffic equilibrium, spatial price equilibrium, small natural gas market equilibrium, MPECs

Afternoon: GAMS exercises (Note: may start Integer Programming if ahead of schedule)

Wednesday 19 June (Instructor: Dr. Jeremy Eckhause)

Morning: Integer Programming (IP): Geometric aspects of IPs, Examples of IPs, Logic problems: Either-or, If-then formulations

Afternoon: IP Examples: piecewise approximations to nonlinear terms, Linearizing products of binary variables, Solving IPs using branch-and-bound, Solving 0-1 IPs using implicit enumeration

Thursday 20 June (Instructor: Dr. Jeremy Eckhause)

Early Morning: HW/In-Class Problems: Formulating IPs, IPs applied to clean energy case study

Late Morning-Early Afternoon: Real Options: concepts, examples, in-class exercises using simple stochastic dynamic programming (SDP) models, applications to clean energy

Late Afternoon: Project Discussions: Possible projects, Student preparation of presentation

Friday 21 June (Instructor: Dr. Jeremy Eckhause)

Morning: Morning: Project Proposal Presentations, Students present their proposed projects to the class (10-15 minutes) per group

Late Morning/Early Afternoon: Exam Review: Format, Review problems, etc.

Exam: tentatively 24 June, 0900-1300