

Singapore IEMBA July/August 2017 -- Analytical Techniques

Date	Day	Projected Start Time	Projected End Time	Class Activity	Material	Preparation/Homework
7/29/2017	Saturday	9:00 AM	10:40 AM	Introduction, basic concepts, overview of course, administrative issues	Lecture	<b>Read</b> Ragsdale chapter 1
7/29/2017	Saturday	11:10 AM	1:30 PM	Introducing optimization models and linear programming: Blue Ridge Hot Tub Visualizing optimization models and solutions Special conditions: nonuniqueness, redundancy, infeasibility, unboundedness <i>Kinds of optimization models: linear/nonlinear, continuous/integer</i> Spreadsheet modeling "What if" versus spreadsheet optimization via Solver, design guidelines A slightly more complicated problem: Make or buy; substituting out variables <i>In-class group work / problem solving</i>	Ragsdale 2.5-2.7 Ragsdale 2.10 (partial) Ragsdale 2.11 Lecture Ragsdale 3-3.4 Lecture, Ragsdale 3.5-3.8 Ragsdale 3.9 and alternate solution in coursepack <i>Ragsdale problems 3.22/weed wackers and 3.20/Valu-Com (time permitting)</i>	Optional: Read Ragsdale chapters 2, 3-3.13
7/29/2017	Saturday	2:30 PM	3:30 PM	Transportation modeling and variable grids Multiple time periods and inventory	Ragsdale 3.11 Ragsdale 3.13	
7/29/2017	Saturday	4:00 PM	6:00 PM	<i>In-class group work / problem solving</i> Go over group work solutions in class	<i>Ragsdale problem 3.35/paper recycling</i> <i>Ragsdale problem 3.43/gas trading -- time permitting or as ungraded homework</i>	
7/30/2017	Sunday	9:00 AM	10:05 AM	Go over solution to gas trading problem		
7/30/2017	Sunday	10:30 AM	12:45 PM	Introducing integer programming: employee scheduling Binary variables: capital budgeting <i>If necessary, review Net Present Value</i> Binary variables and logical conditions/constraints "Carryover" version of capital budgeting with discounting <i>In-class group work / problem solving</i> <i>In-class group work / problem solving</i> <i>People were slow getting back from lunch -- congregated in snack area</i>	Ragsdale 6.9 Ragsdale 6.10-6.11 Lecture Ragsdale 6.12 CAPITAL-BUDGETING-CARRYOVER (coursepack) <i>Ragsdale problem 6.16/video game development</i> <i>Ragsdale problems 6.18/apartment building layout (with data change)</i>	Optional: read Ragsdale chapters 6-6.12, 8-8.4
7/30/2017	Sunday	1:45 PM	3:45 PM	Assignment: grids of binary variables More grids of binary variables <i>In-class group work / problem solving</i> Go over solution to REACTORS problem Remington fixed-charge problem	MACHINCO (coursepack) MILKEM (coursepack) REACTORS (coursepack)	
7/30/2017	Sunday	4:15 PM	6:00 PM	Brief lecture on constraint logic programming The dangers of allocated costs 1 Introduction to nonlinear models EOQ inventory replenishment model (without calculus) One-product pricing model The dangers of allocated costs 2 Go over setup for homework assignment	Ragsdale 6.13 Lecture ALLOCATED (coursepack) Lecture, Ragsdale 8-8.3 Ragsdale 8.4 PRICING (coursepack) Lecture	
8/1/2017	Tuesday	7:00 PM	8:00 PM	Review assignment case solution Decision support systems	Electronically distributed files (BlackBoard) Lecture, Repaired for Takeoff (coursepack)	<b>Assignment:</b> Ragsdale Case 6.4 Optional: read Ragsdale 14-14.7 Optional: read Repaired for Takeoff (coursepack)
8/1/2017	Tuesday	8:20 PM	9:20 PM	Time permitting: Pricing with multiple products and resources Optimization with multiple objectives: Blackstone Mining	MULTIPRICING (coursepack) Ragsdale 7.5 and modified spreadsheet in coursepack	
8/1/2017	Tuesday	9:20 PM	10:00 PM	Weighting multiple objectives, Pareto optimality Begin decision making under uncertainty: hotel site example, EMV criterion <i>Discuss upcoming exam</i>	Lecture Ragsdale 14-14.7	
8/3/2017	Thursday	7:00 PM	8:30 PM	<i>Exam 1 -- deterministic models (first 90 minutes)</i>		Study for exam
8/3/2017	Thursday	8:40 PM	10:00 PM	Decision trees Multi-stage decisions, conditional probabilities, sample information: Colonial Motors Caveats about EMV: risk aversion	Ragsdale 14.11 Ragsdale 14.13 Lecture	Optional: read Ragsdale 14.9, 14.11, 14.13
8/5/2017	Saturday	9:00 AM	10:20 AM	Review first exam Bayes' theorem EVPI	Exam handout Ragsdale 14.14, Problem 14.25, Bayes' theorem notes (coursepack)	<b>Assignment:</b> Freemark Abbey case (coursepack)
1/0/1900	Saturday	10:50 AM	12:00 PM	<i>Help people install YASAI</i> Introduction to simulation Classic newsvendor problem (via simulation)	YASAI User Guide Lecture NEWSPAPER (coursepack)	
8/5/2017	Saturday	1:00 PM	3:10PM	Binomial distributions: Piedmont Commuter Airlines Statistics and simulation <i>In-class group work / problem solving</i> Go over solution to TRANSLATORS problem	Ragsdale 12.14, Binomial and Poisson distributions (coursepack) Ragsdale 12.10 TRANSLATORS (coursepack)	
8/5/2017	Saturday	3:20 PM	5:15PM	Poisson distributions Poisson, binomial, and multiple decisions: OVERBOOK Lecture on continuous random variables Applying continuous random variables: POWERSUPPLY YASAI charting	Poisson slides, Binomial and Poisson distributions (coursepack) OVERBOOK (coursepack) Coursepack p. 82 POWERSUPPLY (coursepack)	
8/6/2016	Saturday	5:30 PM	6:00 PM	<i>In-class group work / problem solving</i>	<i>CHEMSIM (coursepack), DIESEL (coursepack)</i>	
8/6/2017	Sunday	9:00 AM	10:30 AM	INSURANCE North Star solution by both decision tree and simulation	INSURANCE (coursepack) NORTHSTAR (BlackBoard only)	<b>Read:</b> North Star Concert case (coursepack)
8/6/2017	Sunday	11:00 AM	1:00 PM	Go over homework solution Inventory control simulation: Millenium Computer Waiting in line (via simple simulation)	Solutions on BlackBoard Ragsdale 12.15 (minor changes in coursepack) REPAIRSHOP (coursepack)	
8/6/2017	Sunday	2:00 PM	2:50 PM	Discrete-event simulation demonstration Exam review problem, plus EVSI and EVPI for gas drilling problem	Computer animation Exam review material (BlackBoard)	
8/6/2017	Sunday	3:00 PM	5:40 PM	<i>Exam 2 -- stochastic models</i>		