

Singapore IEMBA July/August 2016 -- Analytical Techniques

Date	Day	Projected Start Time	Projected End Time	Class Activity	Material	Preparation/Homework
7/30/2016	Saturday	9:00 AM	10:40 AM	Introduction, basic concepts, overview of course, administrative issues Introducing optimization models and linear programming: Blue Ridge Hot Tubs Visualizing optimization models and solutions Special conditions: nonuniqueness, redundancy, infeasibility, unboundedness Kinds of optimization models: linear/nonlinear, continuous/integer	Lecture Ragsdale 2.5-2.7 Ragsdale 2.10 (partial) Ragsdale 2.11	Read Ragsdale chapter 1 Optional: Read Ragsdale chapters 2, 3-3.13
7/30/2016	Saturday	11:10 AM	1:10 PM	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>	Lecture Ragsdale 3-3.4 Lecture, Ragsdale 3.5-3.8 Ragsdale 3.9 and alternate solution in coursepack <i>Ragsdale problems (3.25/weed wackers; 3.29/Valu-Com if time)</i>	
7/30/2016	Saturday	2:10 PM	3:40 PM	Transportation modeling and variable grids Multiple time periods and inventory	Ragsdale 3.11 Ragsdale 3.13	
7/30/2016	Saturday	4:10 PM	6:00 PM	<i>In-class group work / problem solving</i> Go over group work solutions in class	<i>Ragsdale problems (3.32/paper recycling)</i> <i>Ragsdale problems (3.47/gas trading)</i>	
7/31/2016	Sunday	9:00 AM	10:30 AM	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	Ragsdale 6.9 Ragsdale 6.10-6.11 Lecture Ragsdale 6.12 CAPITAL-BUDGETING-CARRYOVER (coursepack) <i>Ragsdale problems (6.18/video game development)</i> <i>Ragsdale problems (6.14/apartment building layout)</i>	Optional: read Ragsdale chapters 6-6.12, 8-8.4
7/31/2016	Sunday	11:00 AM	12:45 PM	<i>In-class group work / problem solving</i> <i>In-class group work / problem solving</i> Go over solutions to in-class work	MACHINCO (coursepack) MILKEM (coursepack) REACTORS (coursepack)	
7/31/2016	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	Ragsdale 6.13 Lecture ALLOCATED (coursepack) Lecture, Ragsdale 8-8.3 Ragsdale 8.4 PRICING (coursepack) Lecture	
7/31/2016	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	Ragsdale 6.13 Lecture ALLOCATED (coursepack) Lecture, Ragsdale 8-8.3 Ragsdale 8.4 PRICING (coursepack) Lecture	
8/2/2016	Tuesday	6:30 PM	7:20 PM	Review assignment case solution Decision support systems Pricing with multiple products and resources	Electronically distributed files (BlackBoard) Lecture, Repaired for Takeoff (coursepack) MULTIPRICING (coursepack) Ragsdale 7.5 and modified spreadsheet in coursepack Lecture Ragsdale 15-15.7	<b>Assignment:</b> Ragsdale Case 6.4 Optional: read Ragsdale 14-14.7 Optional: read Repaired for Takeoff (coursepack)
		7:30 PM	8:30 PM	Optimization with multiple objectives: Blackstone Mining Weighting multiple objectives, Pareto optimality		
		8:40 PM	9:30 PM	Begin decision making under uncertainty: hotel site example, EMV criterion		
8/4/2016	Thursday	6:30 PM	8:00 PM	<i>Exam 1 -- deterministic models (first 90 minutes)</i>	Ragsdale 14.11 Ragsdale 14.13 Lecture	Study for exam Optional: read Ragsdale 14.9, 14.11, 14.13
		8:10 PM	9:30 PM	Decision trees Multi-stage decisions, conditional probabilities, sample information: Colonial Motors Caveats about EMV: risk aversion		
8/6/2016	Saturday	9:00 AM	10:20 AM	Review first exam Bayes' theorem EVPI	Exam handout Ragsdale 14.14, Problem 14.24, Bayes' theorem notes (coursepack)	<b>Assignment:</b> Freemark Abbey case (coursepack)
8/6/2016	Saturday	10:50 AM	12:00 PM	Go over case assignment solution <i>Help people install YASAI</i> Introduction to simulation Classic newsvendor problem (via simulation)	Solution on BlackBoard YASAI User Guide Lecture NEWSPAPER (coursepack) Ragsdale 12.14, Binomial and Poisson distributions (coursepack) Ragsdale 12.10 <i>TRANSLATORS (coursepack)</i>	
8/6/2016	Saturday	1:00 PM	2:50 PM	Binomial distributions: Piedmont Commuter Airlines Statistics and simulation <i>In-class group work / problem solving</i> Go over solution to TRANSLATORS problem	Poisson slides, Binomial and Poisson distributions (coursepack) OVERBOOK (coursepack) Coursepack p. 82 POWERSUPPLY (coursepack)	
8/6/2016	Saturday	3:20 PM	5:15 PM	Poisson distributions Poisson, binomial, and multiple decisions: OVERBOOK Lecture on continuous random variables Applying continuous random variables: POWERSUPPLY YASAI charting		
		5:30 PM	6:00 PM	<i>In-class group work / problem solving</i>	<i>CHEMSIM (coursepack), DIESEL (coursepack)</i>	
8/7/2016	Sunday	9:00 AM	10:30 AM	INSURANCE North Star solution by both decision tree and simulation	INSURANCE (coursepack) NORTHSTAR (BlackBoard only) Ragsdale 12.15 (minor changes in coursepack) REPAIRSHOP (coursepack) BELTS (coursepack) GENESEQUENCER (coursepack), HORSES (coursepack) Computer animation Exam review material (BlackBoard)	<b>Read:</b> North Star Concert case (coursepack)
8/7/2016	Sunday	11:00 AM	12:40 PM	Inventory control simulation: Millenium Computer Waiting in line (via simple simulation)		
8/7/2016	Sunday	1:40 PM	2:40 PM	Part replacement (BELTS) <i>Time permitting: additional dynamic simulation models</i> Discrete-event simulation demonstration Exam review problem, plus EVSI and EVPI for gas drilling problem		
8/7/2016	Sunday	3:00 PM	6:00 PM	<i>Exam 2 -- stochastic models</i>		