IE 8580 Module 1: Course Preliminaries

Lecture 1.1: Meet Dr. Mason
Brief Background

• Navy brat of a Supply Corps officer
• The University of Texas at Austin
  – BSME 1993, MSE 1995
• Semiconductor industry
  – Sematech
  – Advanced Micro Devices
• Consulting
• Arizona State University
  – PhD, 2000
  – Scheduling wafer fabs

Scott J. Mason, Ph.D., mason@clemson.edu
• Faculty at Arkansas
  – 2000-2010
• Joined Clemson as Professor and Fluor Endowed Chair in July 2010
• Family
  – Wife Andrea (1997)
    • Matthew (2000)
    • Rebecca (2001)
    • Jessica (2003)
Primary Research Interests

• Modeling and analysis of large-scale supply chain, manufacturing, and energy systems
  – “Large-scale” = real world

• Applied operations research with emphasis in mathematical and heuristic optimization
  – Optimization
  – Simulation
  – Scheduling
  – Heuristics
Teaching Areas Outside of MEng

• Optimization
  – IE 8030

• Production Planning, Scheduling, and Control
  – IE 3860
  – IE 4860
  – IE 6860
  – IE 8860

• Decision Support System Development
  – IE 4400

• Capstone Design
  – IE 4670
Practically-Motivated Scheduling and Dispatching Research

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Ready Jobs

Upstream Machine

Downstream Machines

Machine A

Max Batch Size = 6 jobs

Timer

Machine B

Max Batch Size = 6 jobs

Machine C

Max Batch Size = 2 jobs

Machine D

Max Batch Size = 1 job

Jobs that time-out recirculate through m/c A
Forced Transfer Busing

• Students bused to alternate schools when their “home” school is at capacity

• Extra busing results in lost instructional time, both AM and PM
  – Due to lack of available bus drivers, insufficient bus capacity, and/or a desire to decrease transportation costs

• Examining transportation network design strategies to improve transportation efficiency, reduce student ride time/experience, and reduce costs

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Transportation Network Design Strategies

Direct Pairwise  
Hub and Spoke  
Hybrid  
Circuit

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Implemented Research Results

Springdale, AR

Fort Smith, AR
MEng Curriculum Offerings

• IE 8580 Case Studies in Capital Project Supply Chains
  – Focus on integrating topics covered throughout the curriculum using a series of real-world case studies in capital projects

• IE 8590 Capstone Design Project
  – Work with current employer or other firm to identify an applied project requiring MEng-specific skills
Finally...

- Rapid Mental Mathematics
- To square any number ending in “5”
  1. Take everything before the 5
  2. Multiply it by one more than itself
  3. Add “25” to this product

- For example, what is 75 * 75?
  1. Take everything before the 5 → “7”
  2. Multiply it by one more than itself → “7 * 8 = 56”
  3. Add “25” to this product → “5625”
Of Course You Want More!

- 85 * 85?
  - 8 * (8+1) & “25” = 7225
- 105 * 105?
  - 11025

- This actually works for any product of two numbers in which the leading digits are the same and the ending digits sum to 10!
  - 47 * 43?
  1. Take leading digits before the ones place → “4”
  2. Multiply it by one more than itself → “4 * 5 = 20”
  3. Add “21” to this product (i.e., the ones digits multiplied together) → “2021”
Final Exam

• 45 * 45?
  – 2025

• 92 * 98?
  – 9016