Industrial & Systems Engineering
University of Washington

Linda Ng Boyle, Ph.D.
Professor and Chair
linda@uw.edu
Agenda

• *What* is Industrial & Systems Engineering?
• *Where* do Industrial Engineers get jobs?
• *What* classes would you take in ISE?
• *Where* do UW graduates with ISE degrees go?
• My research area
Industrial & Systems Engineering (ISE)

- Design things to be
  - Better quality
  - Higher productivity
  - Easy and safe to use

- ISE is for YOU if you like
  - Mathematics, Statistics, Sciences (physical & social)
  - Problem Solving
  - Designing things for people
  - Working with people
ISEs examine the entire system to help make sure that people and things move well together.
History of Industrial Engineering

• Frank and Lillian Gilbreth (early to mid 1900’s)
  — Efficiency to the extreme
  — Movie: Cheaper by the Dozen (1950 version)

  — Example: Used 2 razors
    • Frank stopped because the time to apply a bandage after cuts was inefficient

Lillian Gilbreth
First working female engineer holding a PhD
* Member #1 in Society of Women Engineers
Industrial & Systems Engineering

• Improving a process
• Enhance productivity

• Improve the efficiency of lines at theme parks
Industrial & Systems Engineering

- Speed up delivery from supplier to customer
- Improve operations (routing, layouts, scheduling)
- Enhance safety and performance
Industrial Engineers are everywhere!

Nancy J. Currie
Astronaut

John DeLorean
Car Manufacturer

Roger Corman
Director, Producer, Screenwriter
“Little Shop of Horrors”
Notable Industrial Engineers in Sports

Charles Armstrong
Former President, Seattle Mariners

Joe Girardi
Former Baseball Player
NY Yankees Manager

Edwin Moses
Track & Field Olympian

Tom Landry
Former Head Coach
Dallas Cowboys
Notable Industrial Engineers

Lee Iacocca
Former CEO, Chrysler Corp.

Erin Wallace
Executive VP, Disney

Michael Eskew
Former CEO, UPS

Tim Cook
CEO, Apple

Charles Holliday
Chairman, Bank of America

Jorge Quiroga
Former President, Bolivia
Industrial Engineering Classes

1. Engineering Economics
2. Probability and Statistics
3. Modeling and Computation
4. Manufacturing and Production Systems
5. Facilities and Logistics
6. Human Factors and Ergonomics
7. Quality Control
UW internships/jobs

• Consulting
  • Accenture, Ernst & Young Consulting, Siemens

• Manufacturing/Operations
  • Amazon, Boeing, TMX Aerospace, Starbucks, UPS

• Computing
  • Apple, Intel, Expedia, Google, Microsoft
UW internships/jobs

• Medical Services
  — UW Medical Center, Children’s Hospital

• Transportation
  — Daimler Chrysler, Ford Motor Company, Paccar Trucking, California Air National Guard

• Research
  — Pacific Northwest Lab, Battelle
ISE at UW

- **Operations Research**
  - Optimize solutions for complex decision making problems
- **Quality Control & Reliability**
  - Improve the quality of products and services
- **Production Systems**
  - Develop new solutions in engineering design, supply chain management, and manufacturing
- **Human Factors & Ergonomics**
  - Design systems to work with or adapt to changing people and environments
My focus area: Human Factors and Transportation

• The study of **factors** and **development** of tools that can enhance the interactions among the driver, vehicle, and roadway
  – Enhance performance
  – Increase safety
  – Increase driver satisfaction and comfort
Is this safe?

Turn up the volume

- Toggle to entertainment
- Find radio
- Select AM or FM
- Set the knob to “volume”
- Adjust the volume

2002 BMW 745 I drive

If interested in more info: USA Today article by James R. Healey, dated Mar. 07, 2002
Human Factors and Statistical Modeling Laboratory

- Our mission
  - Provide knowledge on driver behavior
  - Enhance driver safety
  - Design systems that account for driver-vehicle-roadway interactions
The newer I-Drive

- Programmable Shortcut keys
- Voice recognition

- http://www.thecarconnection.com/cars/bmw_7-series
  “Perhaps the most disliked feature of the new 7-Series was iDrive”
Human Factors & Transportation

- Psychology
- Sociology
- Physiology
- Public Health
- Engineering
- Statistics
- Urban Planning
- Computer Science
- Medicine

College of Engineering
Research in Driver Safety

- **Enforcement**
  - Seat belt, speeding, alcohol and drug use
  - Distracted driving, texting

- **Education**
  - Enhance/enforce driving skills
  - Help drivers recognize/understand risky behavior

- **Engineering**
  - Improve existing roads
    - Rumble strips, widening lanes, traffic signals, lighting
  - Incorporate technology
    - Lane departure systems, anti-lock braking [ABS], collision warning
Active Projects

- How do drivers use/adapt to new technology?
  - Use of new in-vehicle technology
  - Systems to mitigate driver distraction
  - Monitoring systems for truck drivers

- What policies/programs are effective?
  - Driver education programs for teens and senior citizens
  - Driver distraction guidelines

- How do driver differences impact safe driving?
  - Prescription drug use among bus drivers
  - Rehabilitation of cognitively impaired drivers
Driver Distraction

• Research at the University of Washington
• UW 360 Texting and Driving

https://www.youtube.com/watch?v=_mPCKXwgVNz
Thank you!

For additional information

Linda Ng Boyle:  linda@uw.edu
HFSM
  Website: http://depts.washington.edu/hfsm/
ISE Website:
  http://depts.washington.edu/ie/