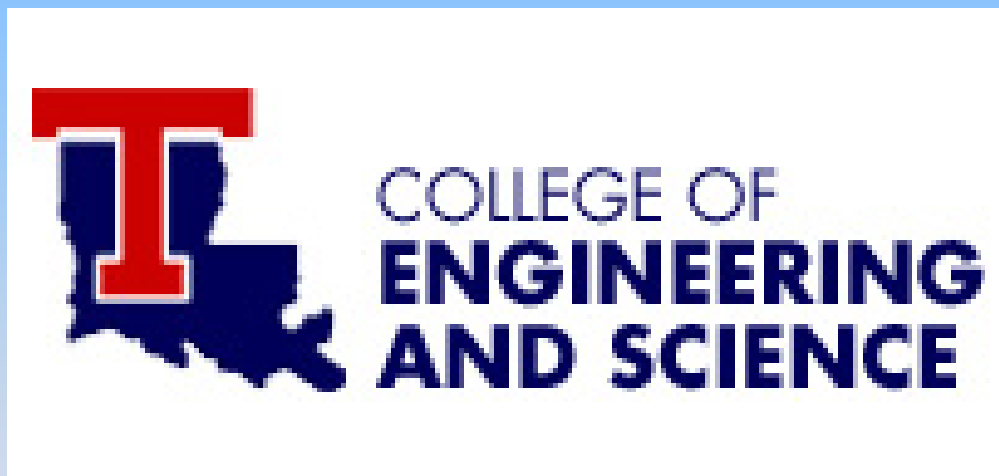


# Industrial Engineering



# Engineers in General...

Create and  
Improve  
Solutions to  
Problems



What does an  
*Industrial Engineer*  
really do?



# Industrial Engineers Find a Better Way...

- We make products and services faster and easier.



# Industrial Engineers Find a Better Way...

- We make products safer.

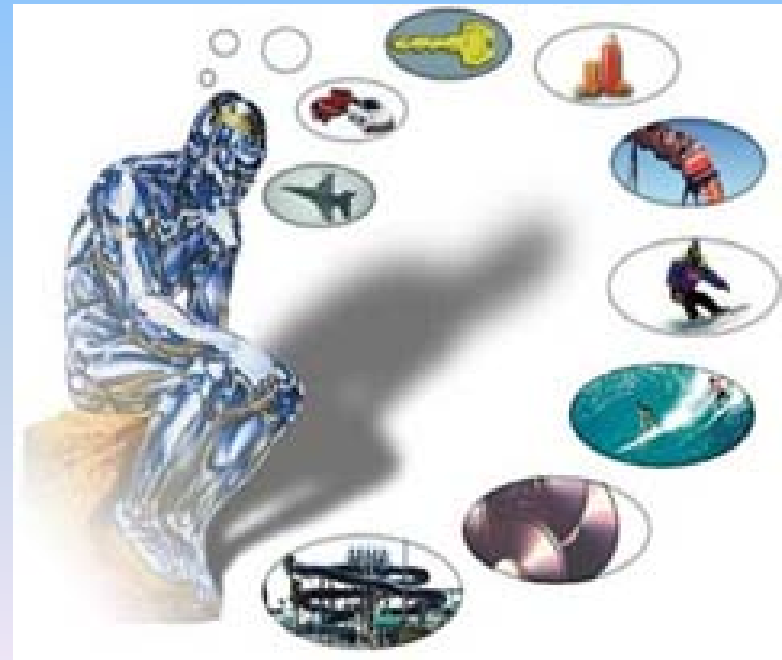


# IE's Focus on "How"

- How services are rendered.
- How products are made.
- That is, IE's *engineer* methods and systems while also considering the human factor in their designs.

# IE's are Problem Solvers

- Like other engineers, IE's use scientific and practical knowledge to solve problems
- IE's use their knowledge in a wider variety of applications than other engineers.



# Industrial Engineering Functional Work Areas

## Product Engineering



- Team Facilitation
- Product Development

## Finance



- Make/Buy Analysis
- Comparison of Alternatives
- Cost Estimating

## Quality



- SPC/SQC
- DOE
- Supplier Quality
- Queuing Theory
- Six Sigma

## Project Management



- Resource Planning
- Risk Analysis
- Project Scheduling

## Production Control



- Job Scheduling
- Expedite procedures

## Facilities



- Layout Design
- Process Flow Analysis

## Factory Operations



- Production Simulation
- Theory of Constraints
- Systems Integration
- OSHA Regulations
- Safety Management
- Linear Programming
- Lean Manufacturing

## Transportation



- Logistics Planning
- Material Handling

## Training



- Course Facilitation

## IE Methods



- Workstation Design
- Ergonomics
- Methods Engineering

## Tooling



- Tool Fab process
- Tool Offload procedures
- Tool Repair process
- Tool Room procedures

## Inventory



- Inventory Management
- Supplier Selection
- Material Requirements Planning
- Supply Chain Management

# Industrial Engineering Alumni

- The next four slides highlight a few of the many Tech IE graduates, their job titles, and places of employment.



*IE Alumni*

# Elizabeth Taylor (2001) and Stephen Zenter (2006)

- Flight Controllers for NASA's International Space Station
- Elizabeth is now the Manager for the Onboard Data Interfaces and Networks Flight Control group.



# Lance Carnahan (2003)

- Hull General Superintendent for Northrop Grumman Shipbuilding



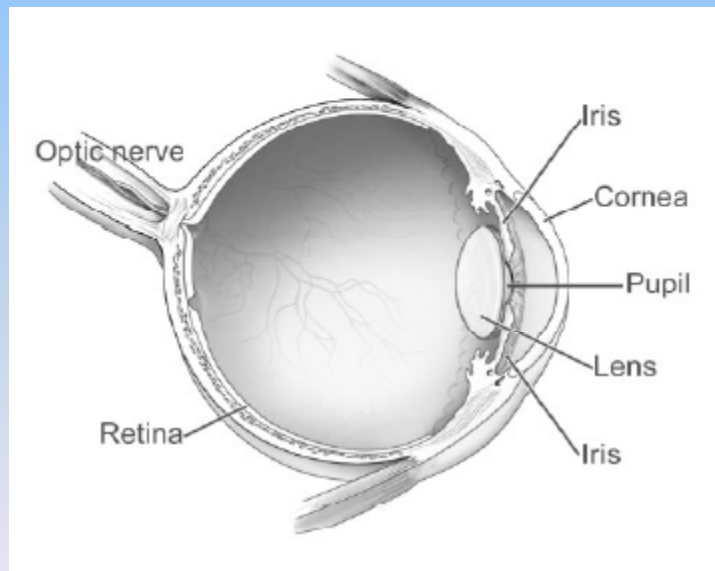
# Courtney Colburn (2008)

- Process Engineer for Folgers Coffee



# Ed McGough (1985)

- Senior Vice President, Global Manufacturing for Alcon Industries



**Alcon**<sup>®</sup>

# Other Employment Opportunities

- The preceding individuals provide examples of companies where IE's work. A short sample of other possible employers includes:

American Express	Ford Motor Company	Lockheed Martin
Blue Cross Blue Shield	Hershey's	Motorola
Boeing	General Electric	Raytheon
Eli Lilly	Kodak	Xerox
Federal Express	IBM	
Fidelity Investments	Intel	And Many, Many More

# Practical Applications of IE

- Designing the layout of an operating room



# Practical Applications of IE

- Designing products for users



# Practical Applications of IE

- Designing automobile interiors

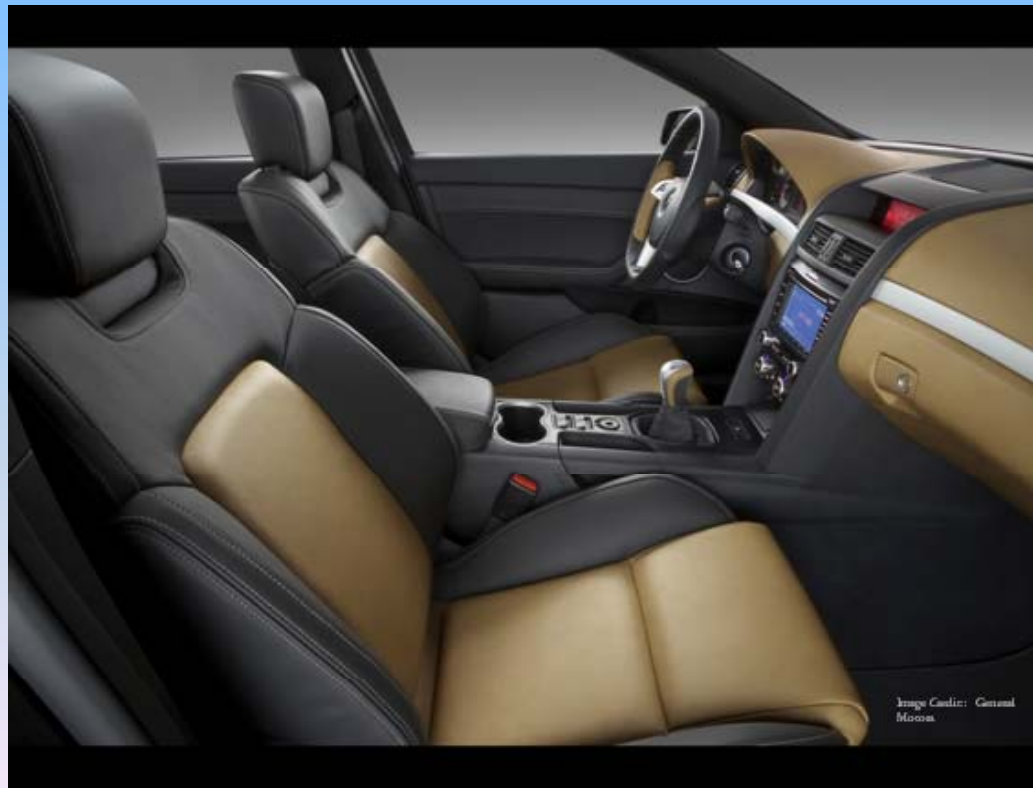


Image Credit: General Motors

# Practical Applications of IE

- Designing cockpits



# Practical Applications of IE

- Designed Experiments...
- Which factors have the most influence on the taste of a soft drink.



# Practical Applications of IE

- How will another line at McDonald's decrease a person's waiting time and be economically justifiable?



# Practical Applications of IE



Improving Productivity Through Automation

# Practical Applications of IE



Finding the Most Economical Route  
for Package Distribution

# IE's are Team Focused

- IE's work with people throughout the organization to help fully understand and solve problems.



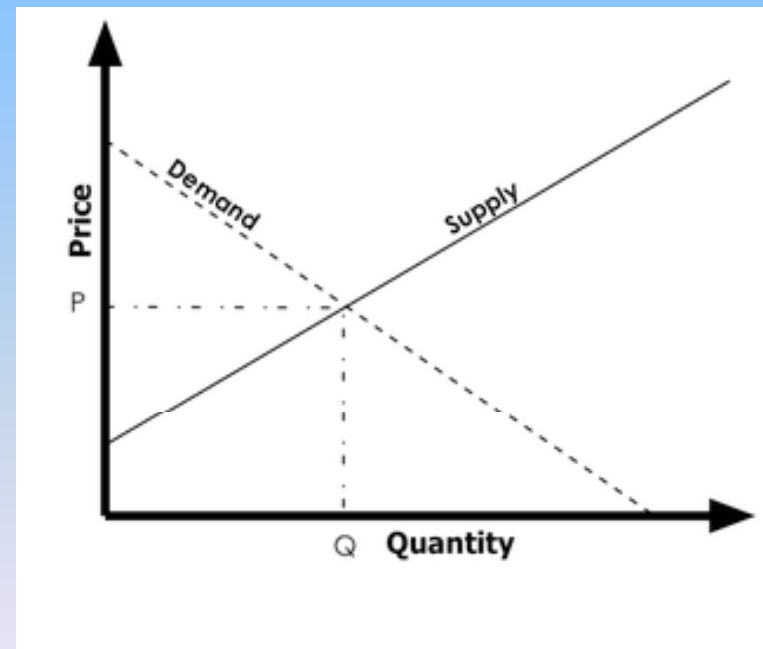
# High Demand for IE's

- Everyone's goal: Improve Productivity and Minimize Operating Costs
- IE's provide logical solutions for achieving these goals through improved *systems*.



# High Demand for IE's

- Many IE's move into management positions because they understand the “big picture”.
- For these reasons, job opportunities for IE's will continue to increase.



# Did You Know?

- At this time, there are approximately 227,000\* IE jobs in the US.
- The Department of Labor projects IE jobs will increase to 270,000\* by the year 2016.

\*Bureau of Labor Statistics  
Occupational Outlook Handbook, 2008-2009 Edition

# Did You Know?

- There are approximately 3,000\* IE graduates each year in the United States.
- Even if a person remained an IE for 25 years (even though many move into management after the first 5 years), the demand for IE's would result in approximately 3.6 jobs for each graduate!!!

$$IE \text{ Job Demand} = \frac{270,000 \text{ jobs}}{3,000 \frac{\text{graduates}}{\text{year}} * 25 \text{ years}} = 3.6 \text{ jobs/graduate}$$

\*ASEE Survey, 2007

# Did You Know?

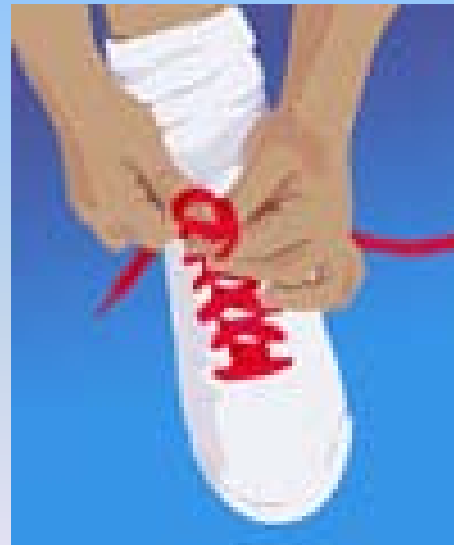
- The Industrial Engineering occupation is the 9<sup>th</sup> happiest (approximately 200 occupations surveyed in the United States).\*
- Among engineering occupations, Industrial Engineering ranks the highest in job satisfaction.\*



*\*Job Satisfaction in the United States*  
Tom W. Smith  
NORC/University of Chicago

# IE's Pull Everything Together

- While all engineers make things better, IE's tie the components together and improve the system as a whole.



# IE's Pull Everything Together

- That is, IE's develop STRATEGIES to make systems more efficient.



# Comparisons

- IE's can be compared to a coach that develops game strategy.
- Given two teams with equal talent, the one with the best strategy will win.



# Comparisons

- IE's can be compared to masterful chess players.
- Most anyone can play chess.
- Great chess players, however, have great strategies!



# Why Should you be an IE at Louisiana Tech?

- Established in 1955, LaTech IE is one of the oldest IE programs in the nation.
- The IE program was first accredited by the Accreditation Board for Engineering and Technology (ABET) in 1972 and has maintained accreditation since that time.

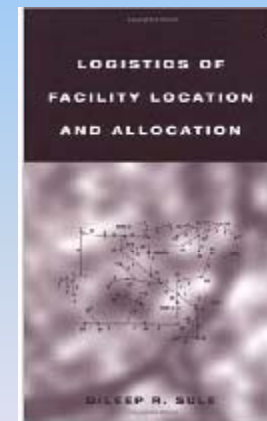
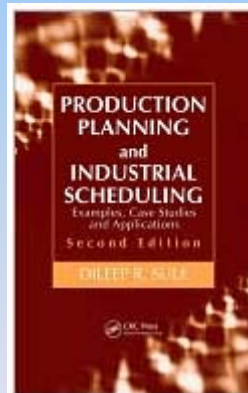
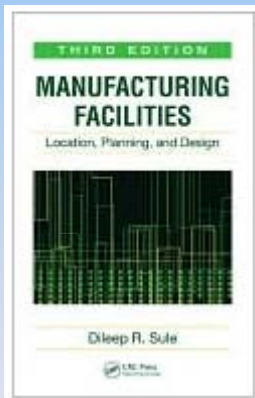
# Why Should you be an IE at Louisiana Tech?

- LaTech IE is noted for its dedicated faculty, advanced laboratory facilities, high levels of student-faculty interaction, excellent job-placement record, and strong ties with area industries.



# Dedicated Faculty

- The IE faculty is internationally known. Many textbooks widely used by other universities in the US and around the world originated from the LaTech IE program.



# Dedicated Faculty

- Many of our most loyal alumni attribute their professional success to the care and concern offered by the IE faculty members during their college careers.

# Advanced Laboratory Facilities

- The IE program is equipped with advanced facilities in excess of a half-million dollars to provide students with hands-on laboratory experiences.

# Flexible Manufacturing Laboratory

- The flexible manufacturing lab contains robots, a computer-controlled mill and lathe, an automated storage and retrieval system, and a conveyor and machine vision system.



# Flexible Manufacturing Laboratory

- The lab was founded by the Louisiana State Board of Regents in 1995 with a \$300,000 grant and was upgraded by another \$53,000 grant in 2007.
- LaTech has one of the best facilities in the nation to teach computer-integrated manufacturing and technology.

# Lean Manufacturing Laboratory

- Established in 2006 through a Board of Regents grant (\$45,000) and a Louisiana Tech Student Technology Fee Board grant (\$10,700), the Lean Manufacturing lab includes advanced computers, software, robotic kits, and simulation tools to enhance student learning.



# Industrial Ergonomics Laboratory

- LaTech has a *new* ergonomics laboratory that will be equipped with advanced computers, software, and measurement tools for students to learn how to make workplaces safer and work methods better.
- Funded by a Board of Regents grant (\$56,000) in 2009, this lab will be functional in 2010.



# High Level of Faculty-Student Interaction

- The typical size of LaTech's upper level IE classes is 10-15 students.
- This allows the faculty more time to spend on the educational needs of each individual student.



# Excellent Placement Record

- Despite poor college graduate placement rates around the country due to the economy (less than 20%), Tech's IE placement rate exceeded 80%.
- In fact, LaTech's IE program has consistently exceeded the 80% placement rate every year.

# Excellent Placement Record

- The average starting salary for our 2009 Spring graduates exceeded \$53,000.
- Most of the LaTech graduates found jobs in Louisiana, Mississippi, Arkansas, and Texas...states that are close to their families.

# Strong Ties with Area Industries

- Over 80% of LaTech IE students have internships or Co-op experiences prior to graduation.



# Strong Ties with Area Industries

- All seniors participate in an industrial project sponsored by area industries. The senior project allows students to practice the skills and knowledge learned in the classroom as well as improve the company's operations.
- Very often, the industrial sponsors for the senior projects offer jobs to students participating in their projects.

# Questions?

- Contact John Easley using any of the following:
- e-mail: [jeasley@latech.edu](mailto:jeasley@latech.edu)
- Phone: 318-257-3165
- I hope to see you at Louisiana Tech!