

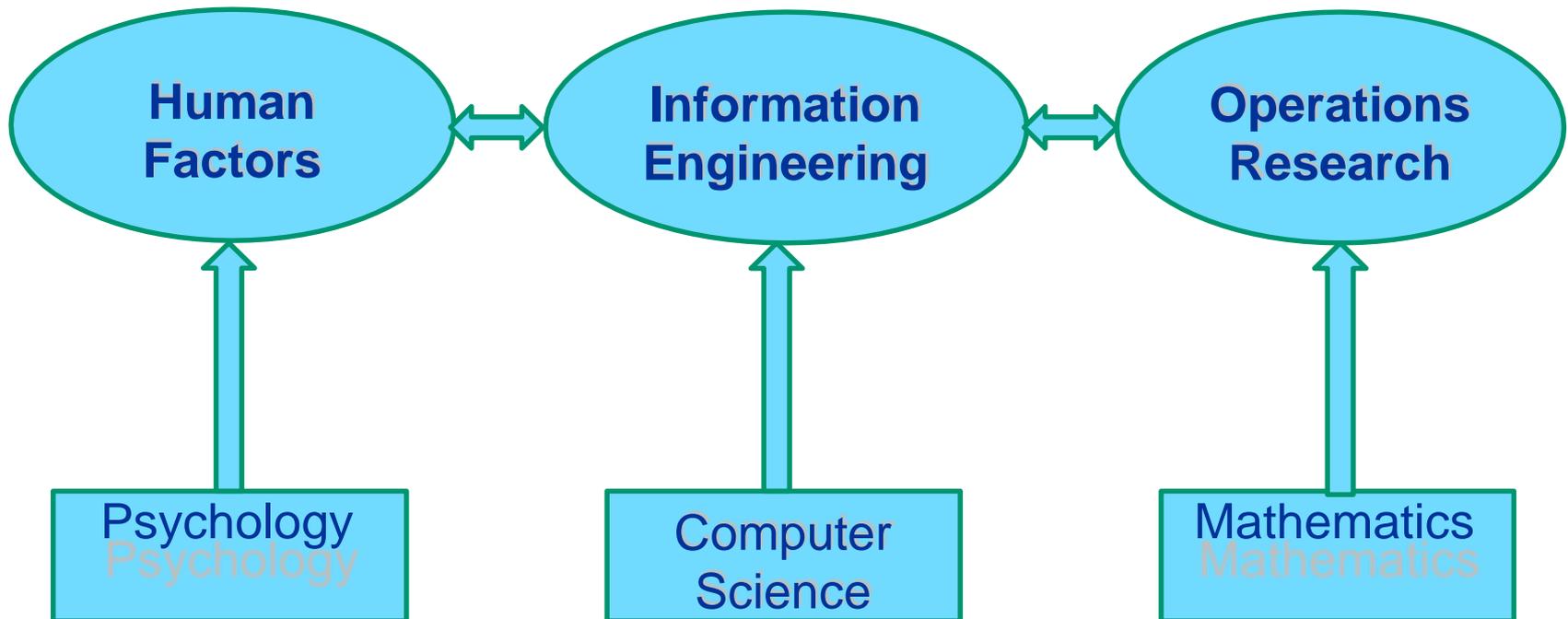
# IE Courses and Streams



Mechanical & Industrial Engineering  
UNIVERSITY OF TORONTO

FACULTY  
OF APPLIED  
SCIENCE &  
ENGINEERING

# Industrial Engineering Streams



# Operations Research (OR)

- ~~What is operations research?~~
- What ISN' T operations research?



# Operations Research

- OR is everywhere!
- And so are OR careers



# Operations Research Areas



Supply Chain



Mechanical & Industrial Engineering  
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FACULTY  
OF APPLIED  
SCIENCE &  
ENGINEERING

# Operations Research Areas



## Power Systems

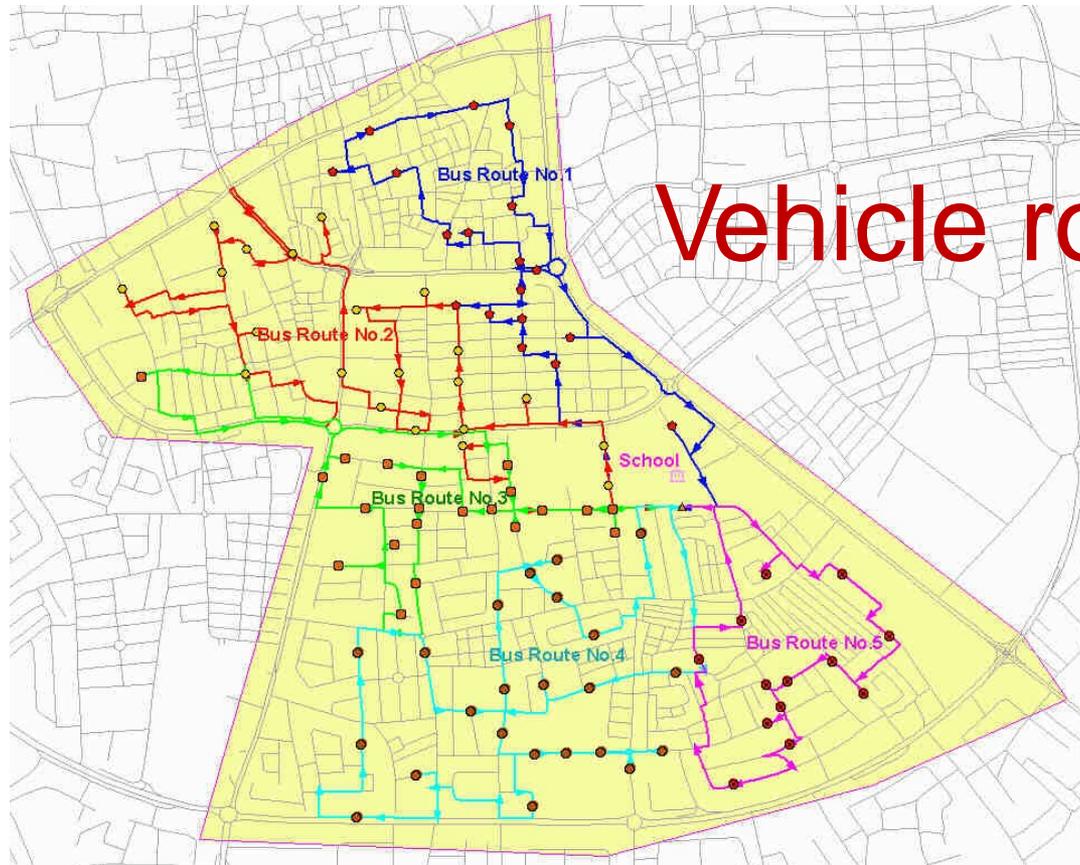


# Power System Applications

- Supply Reliability
- Economic Dispatch
- Unit Commitment
- Maintenance Scheduling
- Asset Management
- Capacity Planning
- Operator Succession Planning



# Operations Research Areas



Vehicle routing



# Operations Research Areas



**Finance**



# Operations Research Areas



**Military**



# Operations Research Areas

Healthcare



# Healthcare Applications

- Operating Room Scheduling
- Radiation therapy treatment
- Health Human Resources
- Facility Location
- Capacity Planning
- Patient Flow
- Blood Supply Management



# OR Core Courses

## Second Year

- **MIE250:** Fundamentals of Object Oriented Programming
- **MIE262:** Operational Research I: Deterministic OR
- **MIE263:** Operations Research II: Stochastic OR

## Third Year

- **MIE360:** Systems Modelling and Simulation
- **MIE335:** Algorithms & Numerical Methods
- **MIE363:** Resource and Production Modelling
- **MIE364:** Quality Control and Improvement



# OR Technical Electives

## Third Year

- **MIE365:** Operational Research III: Advanced OR
- **MIE354:** Business Process Engineering
- **MIE469:** Reliability and Maintainability Engineering
- **MIE367:** Cases in Operational Research

## Fourth Year

- **MIE562:** Scheduling
- **MIE566:** Decision Analysis
- **MIE561:** Healthcare Systems
- **MIE465:** Analytics in Action\*\*\*\*
- **MIE498H/Y:** Research Thesis\*



# Careers in Operations Research

- Manager, Business Strategy at **Air Canada**
- Missionary at Global Outreach Mission, Author of "On the Potter's Wheel"
- Consulting Executive - Technology Strategy Sr Manager at **Accenture**
- **Avenue Investment** Management
- Senior Manager, at **BMO** Financial Group
- **Google** Asia & Pacific Financial Planner and Analyst
- Director, Commercial & Supply Chain (Retail Division) at **Webcor** Group
- Consultant at **Avanade**
- Senior Consultant at **Capco**
- Healthcare IT Professional at **Carestream Health**
- Program Manager at **Enoro** (Finland)
- Health Policy and Management Specialist at **Cancer Care Ontario**
- Project Manager – Lean, Ontario Ministry of the **Attorney General**



# Operations Research Faculty

Michael Carter



Timothy Chan



Dionne Aleman



Michael Kim



Roy Kwon



Chi-Guhn Lee



Viliam Makis



Daniel Frances



Chris Beck



# Graduate Studies for Operations Research

Want to be an Industrial Engineer? → Work for a while + MBA?

Want to be an Operations Researcher? → Grad school?

**M.Eng:** Professional development degree

10 courses or 7 courses plus a project

12 months full time or longer part time.

Optional Certificates, e.g. Healthcare Engineering Certificate

**M.A.Sc:** Develop your research abilities

4 courses plus a research thesis

2 years is typical

**Ph.D:** Looking for a career in research or teaching?

5 courses plus thesis

4 years is the target





# Ontario's Bulk Electricity System Diagram

