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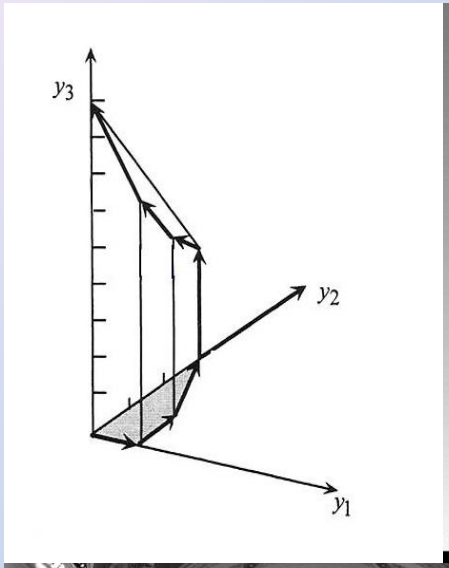
Operations Research (Mathematics)
Management and Systems Science (MSSC)

- Employers are desperate to make use of information
  - Buzzword: **Analytics**
  - Need workers with skills to
    - *Understand problems faced by businesses*
    - *Collect and analyze information*
    - *Devise and implement solutions*

Two programs at SFU Surrey applying analytics to understand and solve real-world problems:

Operations Research (Mathematics),
Management and Systems Science

Analytics



Applying mathematics to solve problems in industry

Engineering, business, finance, computer science, manufacturing, health care, . . .

Analytics

Making better decisions in a complex world

Optimization; finding the best solution using limited resources

- Quickest time
- Shortest path
- Least cost
- Maximum profit
- Minimum waiting time

Operations Research – O.R. (Mathematics)

- A combination of mathematics, statistics and computing skills
- Learn mathematical methods to solve complex problems
- Experience working on real-world problems
- Report writing, group work, presentations

Management and Systems Science - MSSC

- Business structures and dynamics, marketing, management
- Mathematical techniques of optimization and improvement
- Computational techniques of programming, simulation and design

Financial Planning

How should a company allocate funds to each of several projects over the next 5 years in order to maximize the expected return?

Transportation

Determine how to transport goods in a cost effective way.

Disease Treatment

Determine the dosage of radiation or chemicals to administer to a patient.

Scheduling

- schedule final examinations at a university

- schedule employees in a company

Queuing

What is the best way to staff a call centre?

How many tellers should be working in a bank?

How long will the line up be to get your car washed?

Hospital Utilization

How do we allocate patients and nurses to hospital beds?

How do we allocate transplant organs to people in need?

O.R. and MSSC Grads Get Great Jobs!

Incredibly diverse opportunities:

- Information Technology
- Business/Systems Analysis
- Supply Chain/Inventory Analysis
- Operations Research
- Product Management
- Quality Assurance
- Accounting
- Intellectual Property Security
- Health Care
- Teaching
- Patent Law

This course will give you a (gentle) introduction to operations research (and analytics modelling), and give you a quantitative (Q) and writing (W) credit too!

Math 208W

Introduction to Operations Research

Spring

(prerequisite: Calculus I)

Core modelling courses in the O.R. Program:

Math 208W

Introduction to Operations Research

Spring

Math 402W

Operations Research Clinic

Spring

Seminar courses in the MSSC Program:

MSSC 180

Undergraduate Seminar in MSSC

Fall

MSSC 481

Undergraduate Seminar in MSSC

Fall

SFU Operations Research students (Math 402W) win big at the CORS students paper awards; 2012, 2013, 2014!

Program Requirements

Operations Research

- 13+ mathematics courses
- 6+ statistics
- 3 computing science

Interdisciplinary requirement:
5+courses in:
actuarial science, business, economics, resource and environmental management, mathematics, statistics, computing science

MSSC

- 10 mathematics courses
- 4 statistics
- 7 computing science
- 7+ business

Additional Information

Webpages:

http://www.surrey.sfu.ca
→ prospective students → academic programs

http://www.math.sfu.ca
http://stat.sfu.ca

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