

Review Lectures 14-26

16 Nov 2009

CMPT140

Dr. Sean Ho

Trinity Western University

Engineering Meeting

Wednesday 18 November, 7:00-8:30 PM

NEU 36

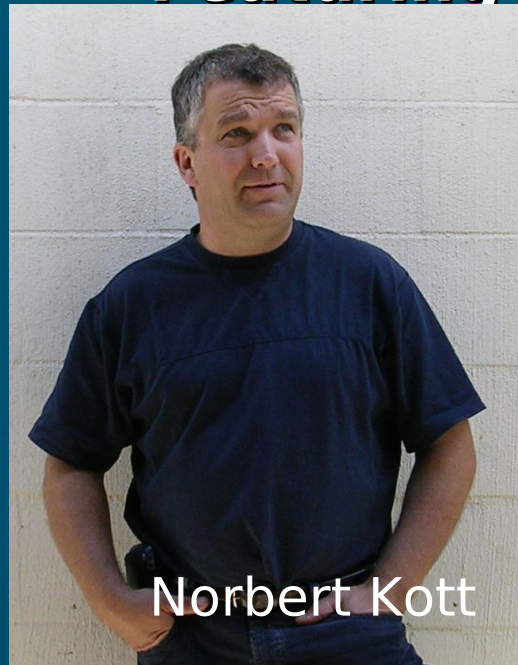
Featuring

Founder



IDEAS 2 REALITY

Experts In Delivering New Technology



Norbert Kott

Adjunct Professor of
Mechanical Engineering



“Engineering: Becoming an Apprentice in
the Creation Department of God’s
Kingdom”

Also speaking:

Dr. Arnold Sikkema

TWU Coordinator of Engineering Transfer

“Tips for a Successful Transfer to UBC (or elsewhere)”

RSVP Arnold.Sikkema@twu.ca by noon Tuesday



Topics in lectures 14-26

- Applications:
 - Stub programs: prime sieve
 - Recursion: factorial, Fibonacci
 - Libraries: Caesar cipher, pseudorandom
- File I/O: open(), read()/write(), pickling
- Exceptions
- Number bases, memory, storage
- Object-oriented programming
 - Defining classes, copy vs. alias

Applications

- Prime sieve
 - How it **works**; do it by **hand**
 - Using **stub** functions in development
- Factorial and Fibonacci
 - **Recursion**, stack, **stack frame**, backtrace
- Caesar (substitution) cipher
 - Designing libraries: **header** vs. **implement.**
- Pseudo-random number generator
 - How it **works**, **seed**, be able to **code** one

File I/O

- **Principles:** file handle, I/O channels, streams
- **Code:** `open()`, file modes (`r`, `w`, `a`, `r+`, and `b`)
- **Reading:** `read()`, `readline()`
- **Seeking:** `seek()`, `tell()`
- **Writing:** `write()`
- **Buffered output and** `flush()`
- **Pickling:** `pickle.dump()` and `load()`
- **Standard I/O Channels:** `sys.stdout`, `stdin`, `stderr`

Exceptions

- try/except
 - else, finally
- Catching **multiple** exceptions: (a, b)
- Assigning a caught exception to a **name**
 - ◆ **except ExceptionType as varname:**
- **Common** exceptions
 - ◆ **ZeroDivisionError, NameError, TypeError, IOError, KeyboardInterrupt, SyntaxError**
- The Python way to open **files**: with
 - ◆ **with open("file.txt") as myFile:**

Number bases and storage

- Decimal, binary, octal, hexadecimal
 - Be able to convert amongst all!
 - Notation: 0x, 0
- SI vs. binary units of measure:
 - Gigabytes vs. gibibytes
- Bits, Bytes, Nibbles
- Memory address, Words, Pages
- Hard drive geometry: Cylinder/Head/Sector

Object-oriented programming

- Objects, classes, instances
- Methods, attributes, interfaces
- Constructor/initializer, destructor
 - Default parameters to initializer
 - Instantiating an object by calling constructor
- Designing classes
- `__str__()`
- Alias vs. shallow copy vs. deep copy
- Creating a list of objects