what’s CSC165?

This is a course about expression (communication):

- with and through programs
- with developers
- knowing what you mean
- understanding what others mean
- analyzing arguments, programs
why CSC165?

Do you:

- MEMORIZE math?
- HAVE TROUBLE explaining what you’re doing in technical work?
- HAVE TROUBLE understanding word problems?

DON’T YOU:

- ENJOY reading math books for new material
- LIKE talking about abstract $x$ and $y$ as much as particular examples of what $x$ and $y$ represent?
CS needs math:

- graphics
  - linear algebra, multi-dimensional calculus
- cryptography
  - number theory, field theory
- artificial intelligence
  - probability, set theory
- numerical analysis
  - calculus, linear algebra
- networking
  - statistics
- databases
  - set theory
doing well in CSC165

Doing well has two aspects: being recognized as doing well by being awarded credit (grades), and being able to retain concepts and tools for use later on. Here’s how to do both:

- Read the course web page regularly. Understand the course information sheet.

- Spend enough time. We assume an average of 8 hours/week — three in lecture, two in tutorial, three reviewing or working on assignments.

- Ask questions. Make your own annotations.
When you use a natural language (English, Chinese) you can make it as precise or ambiguous as you need. For some purposes (jokes, gossip) rich ambiguity is essential. For other purposes (getting instructions on heart surgery) precision is essential. We’re all equipped to work in both modes. Work out the double meanings of these headlines:

- Prostitutes appeal to Pope
- Death may cause loneliness, feelings of isolation
- Two sisters reunite after 18 years at checkout counter
- Iraqi head seeks arms
- Police begin campaign to run down jaywalkers
We achieve precision by restricting our language. For certain jobs, in certain communities, we use some words or symbols with restricted meanings. Becoming part of the “club” involves learning the definitions of these meanings — my kids don’t mean the same thing as I do when they say something is “sick” or when they say “snap.” Some words and symbols used in special ways by mathematicians:

- continuous
- field
- group
- for all (each) \( \forall \)
- there is (exists) \( \exists \)
• computers are precise — they execute identical instructions identically

• humans are as precise as necessary, and different human audiences require different levels of precision

• The really difficult job is finding the right level of precision. Too much precision introduces unbearable tedium; too little introduces unfathomable ambiguity.

• Proofs are primarily works of literature: they communicate with humans, and the best proofs have suspense, pathos, humour and surprise. As a side-effect, proofs present a convincing argument for some fact.