course webpage:
https://tinyurl.com/csc2125h

CSC2125H
Types and Programming Languages

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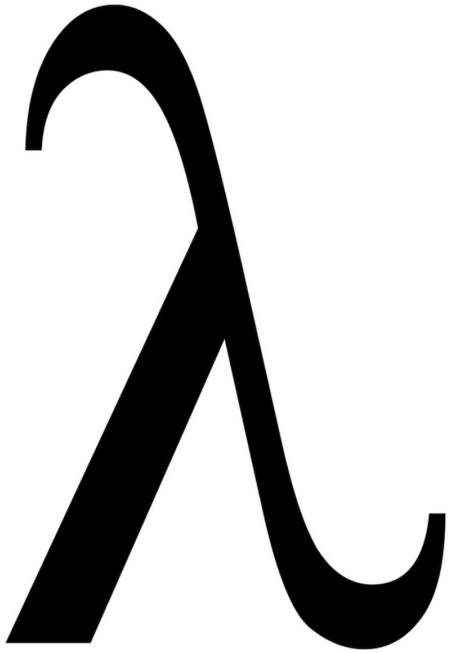
Have a seat! We will start at UofT time (12:10pm)

Today

- Course overview
- We will start with the lambda calculus!



This course

Course: Friday 12-2pm, with a 10min break at 1pm

Instructor: Dr. Ningning Xie
ningningxie@cs.toronto.edu
Office Hour: BA 3256, Friday 3-4pm

TA: Tsung-Ju Chiang
tsungju.chiang@mail.utoronto.ca
Office Hour: BA 3232, Tuesday 12-1pm

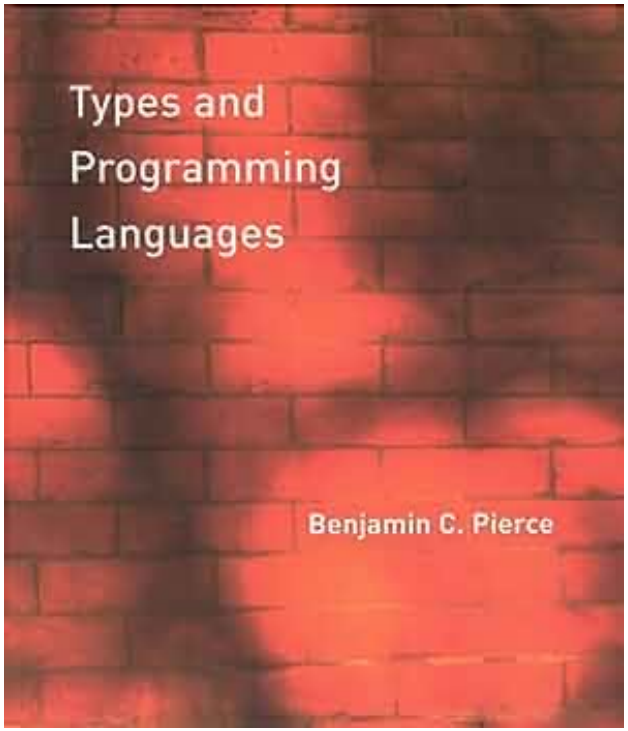
This course

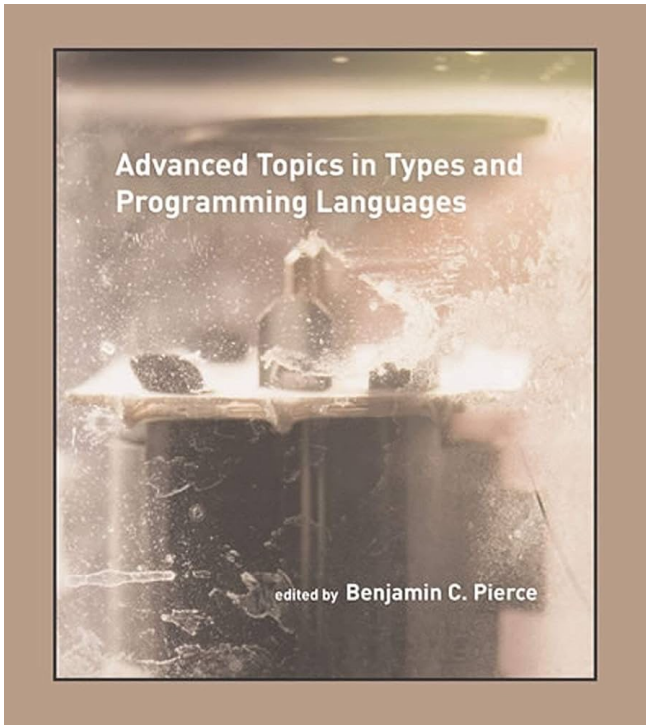
- Study programming languages
  - Programming is at the heart of computer science
  - Languages are not all the same
    - Some languages are measurably better than others
    - Languages have different purposes.
  - Fun!

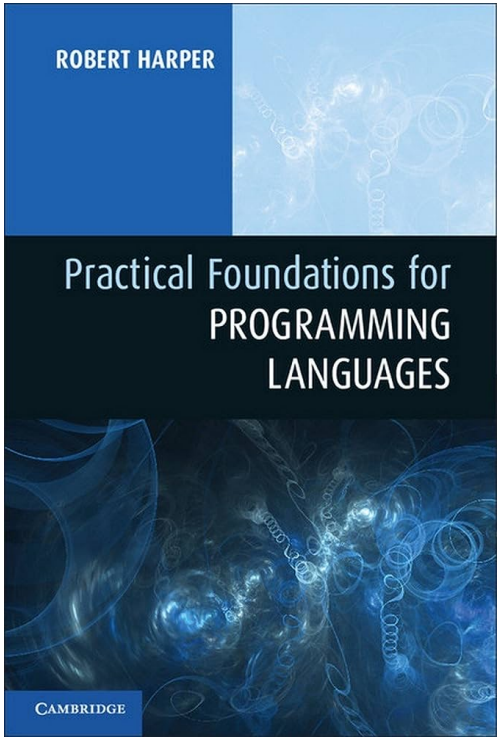
How?

- Break down into small universal building blocks (e.g., functions or pairs)
- Types are the central organizing principle
- Focus on semantics, not syntax
  - How does it compute (operational)
  - What does it compute (logical)
- Investigate properties of all programs expressible in a language

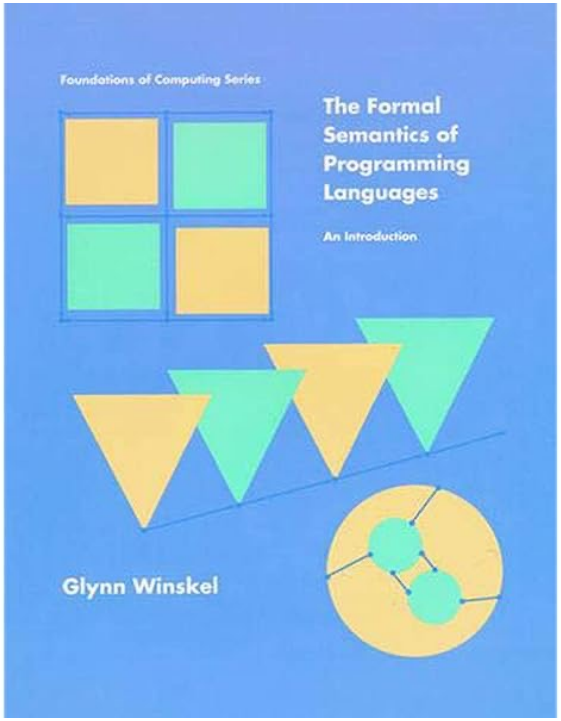
No required textbooks

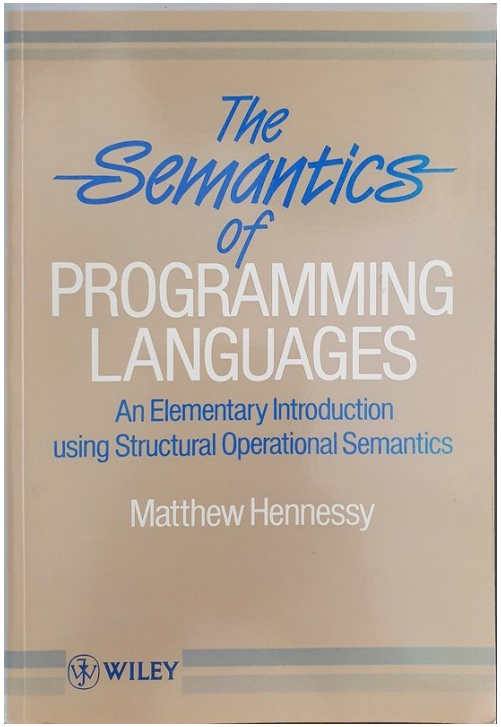






No required textbooks





Evaluation

- (10%) Active learning and participation

  Attendance, in-class/online discussion, office hour.
- (15%) Three small-ish assignments

  Late submissions: 90% within 1 day, 70% within 3 days

  No Plagiarism!
- (20%) Paper presentation + Q&A
- (55%) Final project (your choice)

  Proposal (15%), presentation (20%), report (20%)

(Tentative) Schedule

- Week 1-5: Lectures
- Week 6-10: Paper presentations
- Week 11-12: Project presentations

First assignment

- Due in 2 weeks
- The PDF and the source will be distributed on the course page: https://tinyurl.com/csc2125h
- Submit your PDF file to TA via emails

Paper presentation

- Motivation:
  - Learn something new & cool.
  - ”What are people doing in the PL community?”
  - “Is PL my thing?”
  - Practice presentation skills.

- The list will be out on the course website.
  - If you want to present a PL paper that is not on the list, first discuss with me (at least three weeks before).

Paper presentation

- Preparation:
  - Start as early as possible! (at least two weeks before)
  - Meet TA and ask for feedback (at least one week before)
  - Heads-up: You will likely need to learn more resources and/or read more papers in order to fully understand your selected paper!

Paper presentation

- A 25min talk + 5min Q&A :
  - Background
  - Problems & Challenges
  - Main idea
  - Main results (theoretically and/or practically)
  - Related work
  - Future work

Paper presentation

- Tips:
  - Recommend: How to read a paper (a 2-page article) https://web.stanford.edu/class/ee384m/Handouts/HowtoReadPaper.pdf
  - Clarity is the most important!
  - You should enjoy this process: you just learned something new & cool, so inspire and impress your peers!

Final project

- Up to 3 students per group
  - For any group with >1 student, a statement of contribution is required in the final report.
- Proposal due in 5 weeks
- You can ask TA or myself for feedback

Final project

- It could ... (theoretically and/or practically)
  - Reproduce a paper
  - (Re)implement a library; mechanically formalize a small calculus
  - Study a language feature and possible extensions
  - Investigate an open-ended research question
  - Your choice!

  ... all depends on the concrete novelty and efforts.

Questions?

Acknowledgements

Many materials in the course are taken from public resources, and we thank the people who share the materials online.