

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

CSC2125H

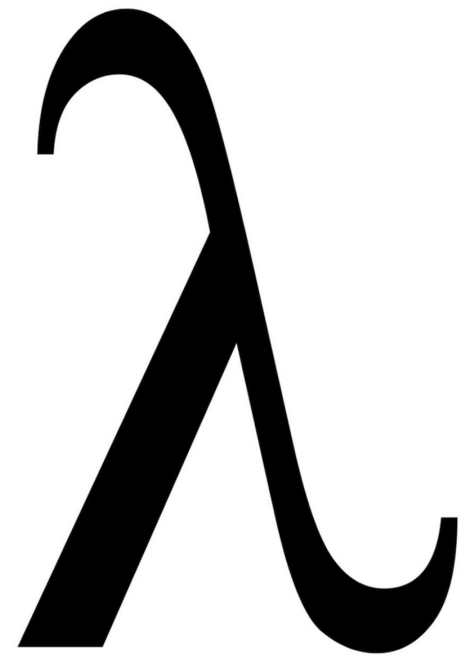
Types and Programming Languages

Ningning Xie
Assistant Professor
Department of Computer Science
University of Toronto

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



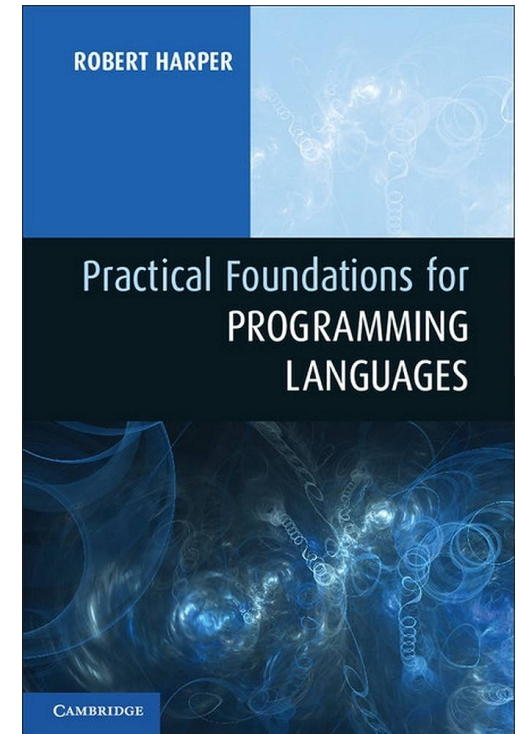
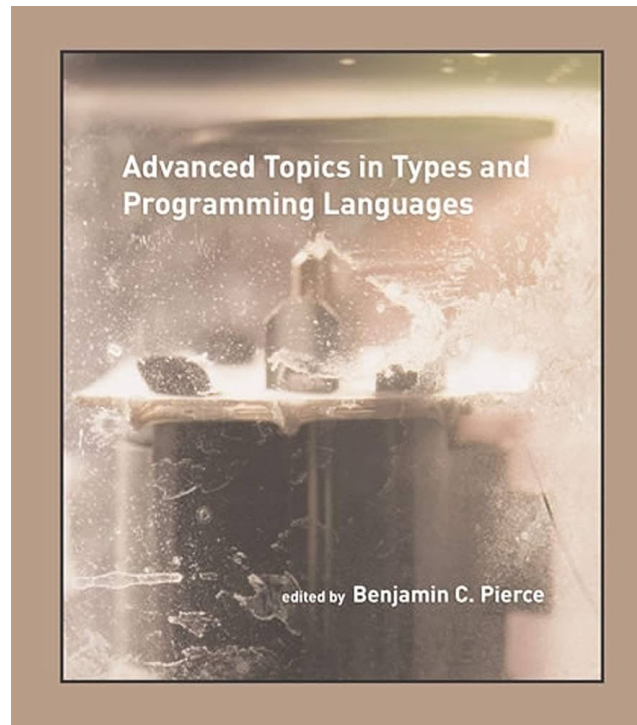
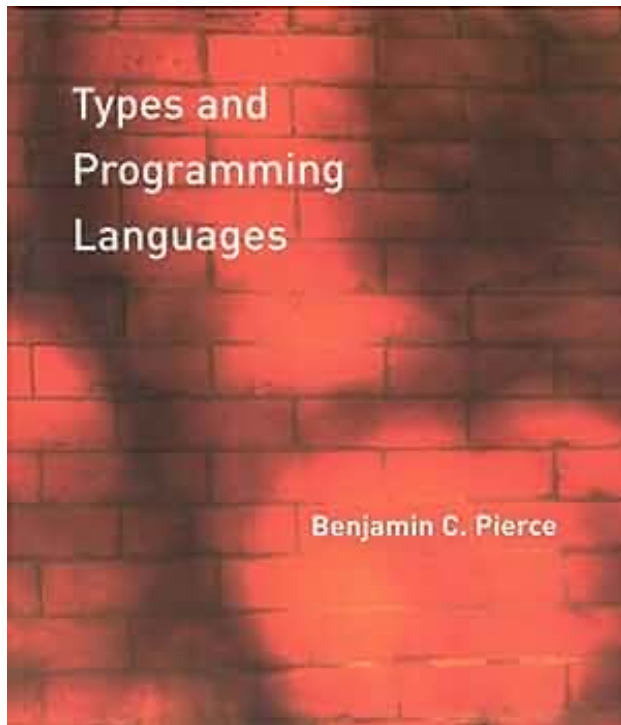
This course

- 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!

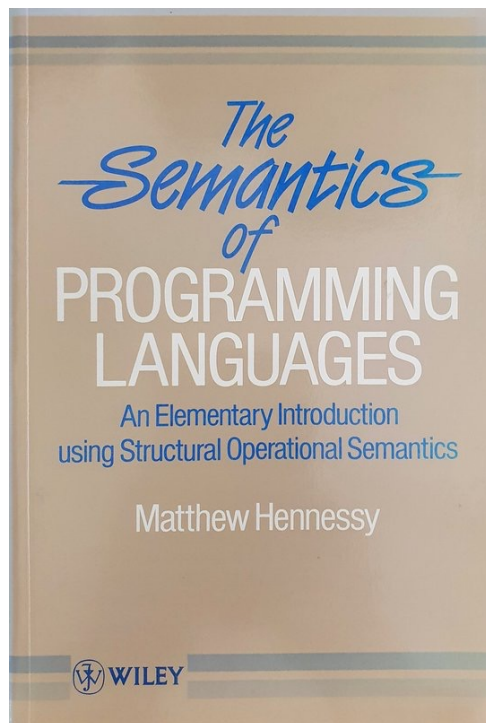
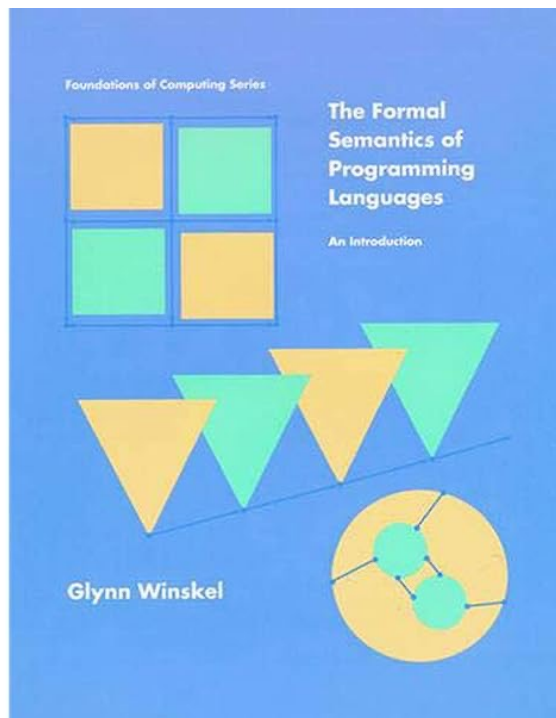
How?

- 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.