Introduction

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• Who am I?
  – Nick Sumner (wsumner@sfu.ca)
  – Research Faculty (Software Engineering, Compilers, Program Analysis)
Introduction

- Who am I?
  - Nick Sumner (wsumner@sfu.ca)
  - Research Faculty

- Who is your TA?
  - Golnaz Gharachorlu
Introduction

- Who am I?
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  - Research Faculty

- Who is your TA?
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- **What is the course website?**
Introduction

- Who am I?
  - Nick Sumner (wsumner@sfu.ca)
  - Research Faculty

- Who is your TA?
  - Golnaz Gharachorlu

- What is the course website?

- Where can you discuss course issues?
  - CourSys
    https://coursys.sfu.ca/2019fa-cmpt-479-x1/discussion/
What is this class?

- **Software engineering** (informally)
  - Systematic approaches for managing risk while producing or providing software.
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Programs are themselves data that you can construct, analyze, transform, synthesize, ...
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  – Spans techniques from novel logics to rigorous empirical assessment.
  – Rich *interaction* between theory and practice matter.
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I will expect you to reason formally.
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  - Systematic approaches for managing risk while producing or providing software.
  - How can we write code that is adaptable to changing requirements?
  - How can we find bugs and ensure correctness?
  - Can you defend against attackers?
  - Can you discover what attackers have done?
  - Can you automatically generate software?
  - Spans techniques from novel logics to rigorous empirical assessment.
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  I will expect you to
  
  reason formally.
  
  reason practically.
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- How can we determine the correctness of code?
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apply formalism to solve practical problems.
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I will expect you to

- reason formally.
- reason practically.
- apply formalism to solve *practical problems*.
- recognize that practice may differ from formalism.
What is this class?

Software Engineering
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Software Engineering

This Class
What is this class?

Software Engineering

There is too much breadth.
There is too much depth.

This Class
What is this class?

- Important things we will not cover (nonexhaustive)
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- Important things we will **not** cover (nonexhaustive)
  - Social aspects of software engineering
  - Project planning and management (Agile vs agile vs ...)
  - Requirements management
  - SLOs, SLA, and most SRE
  - Monoliths vs Services vs Microservices
  - Middleware management
  - ...
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  - ...

These are worthwhile topics. Seek them elsewhere.
What is this class?

- What we will (likely) cover
  - Foundations of software design
  - Performance & bottleneck analysis
  - Testing
  - Formal models of programs
  - Symbolic execution and automated test generation
  - Dynamic analysis
  - Static analysis
  - Parallelism & concurrency
  - Software security
  - Program synthesis
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- https://www.cs.sfu.ca/~wsumner/teaching/745/19/schedule.html
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There is still far too much! We will focus on breadth over depth.
What is this class?

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- What we will (likely) cover

CMPT 373

CMPT 473

This Course

My Seminar
How will the class be structured?

• Grading:
  – Assignments (weekly): 50%
  – Exams: 25%
  – Term Project: 25%
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  - A short programming and/or written assignment each week
  - Demonstrate understanding & application of in class material
  - Will expect you to think critically & independently
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  - A short programming and/or written assignment each week
  - Demonstrate understanding & application of in class material
  - Will expect you to think critically & independently

- **Exams**
  - Just the final
  - Demonstrate competence & application of course material
How will the class be structured?

- **Term Projects:**
  - An open ended project that demonstrates competence
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  - For undergrads, I have preplanned projects if you want them
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  - Discussing with me in advance is recommended
  - Initial proposals due on Oct 16. Meetings w/me on 16th & 17th.
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I want you to walk away with a project you are proud of. It may lead to a paper. It may to a business.
Policies & Expectations

- Late Submissions
  - None accepted
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- **Cheating**
  - Any instance results in a score of 0 for the entire assignment involved.
  - Repeat offenders will be reported and recommended for immediate failure in the course.
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"It is better to get 0 credit than to cheat!"
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- **Expected Workload**
  - Strong should expect to spend 9-10 hours outside of class per week.
  - If you are missing some skills, you should expect to spend more.
  - This is not a required class.
    If you are only here for credit, it is better to leave.
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- **Attendance**
  - You don’t have to attend, but all in class materials are your responsibility
Let’s get started