

CMPT 479/745
Software Engineering: Theory and Practice

Introduction

Nick Sumner
wsumner@sfu.ca

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

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 - Research Faculty
- Who is your TA?
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- What is the course website?
 - <http://www.cs.sfu.ca/~wsumner/teaching/745/>

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- What is the course website?
 - <http://www.cs.sfu.ca/~wsumner/teaching/745/>
- Where can you discuss course issues?
 - CourSys
<https://coursys.sfu.ca/2023sp-cmpt-982-x1/forum/>

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 - 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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 - Can you automatically generate software?
 - 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

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 - Can you reason formally?
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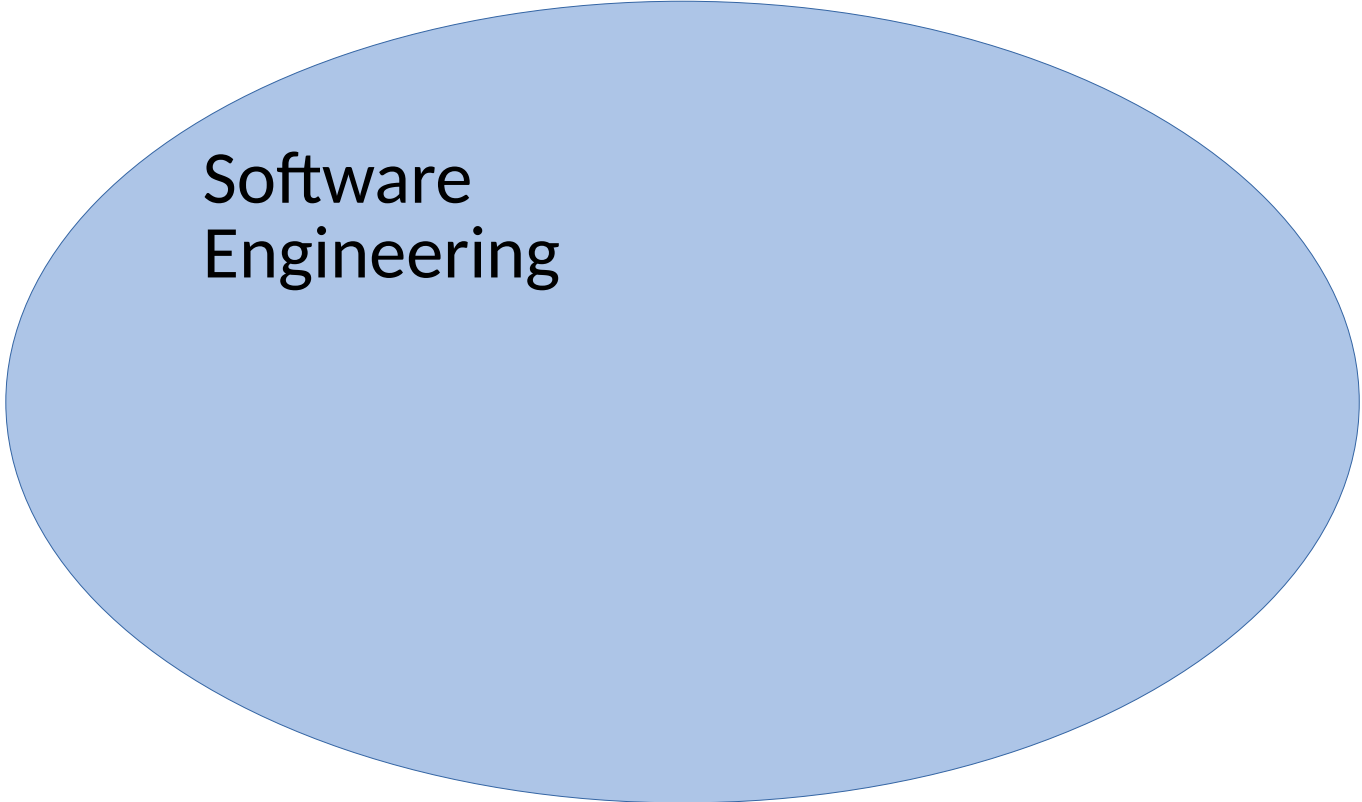
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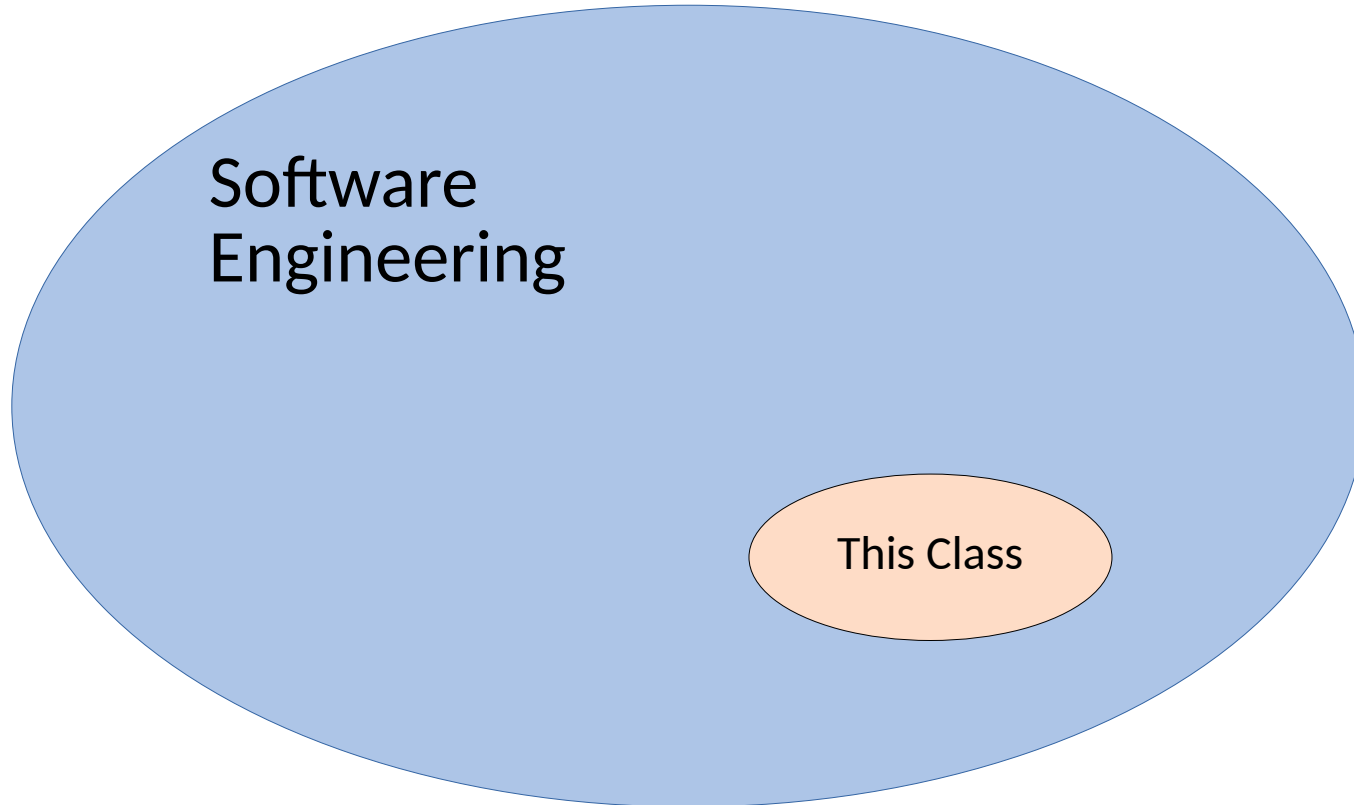
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 - Can you recognize that practice may differ from formalism.
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Software
Engineering

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

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 - Project planning and management (Agile vs agile vs ...)
 - Requirements management
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 - Monoliths vs Services vs Microservices
 - Middleware management
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These are worthwhile topics.
Seek them elsewhere.

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 - Foundations of software design
 - Performance & bottleneck analysis
 - Testing
 - Formal models of programs
 - Symbolic execution and automated test generation
 - Dynamic analysis
 - Static analysis
 - Parallelism & concurrency
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There is still far too much!
We will focus on *breadth* over *depth*.

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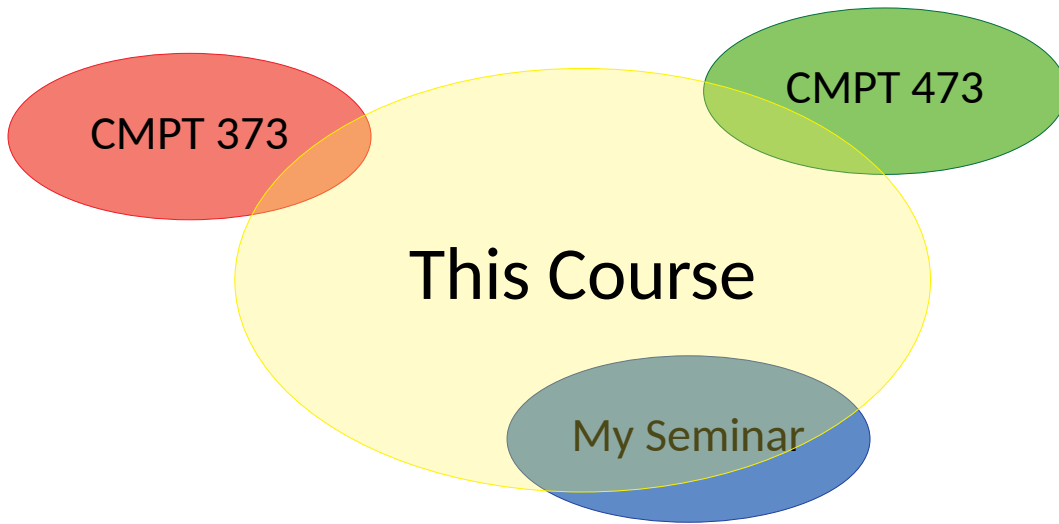
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Will make use of at least
C++, Java, and Python

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- Exams
 - Just the final
 - Demonstrate competence & application of course material

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 - **Discussing with me in advance is recommended**
 - **Initial proposals due by Feb 14th. 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.
It may lead to a tool.

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It is better to get 0 credit than to cheat!

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- **Expected Workload**
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- Attendance
 - You don't have to attend, but all in class materials are your responsibility

Let's get started