

15-122: Principles of Imperative Computation

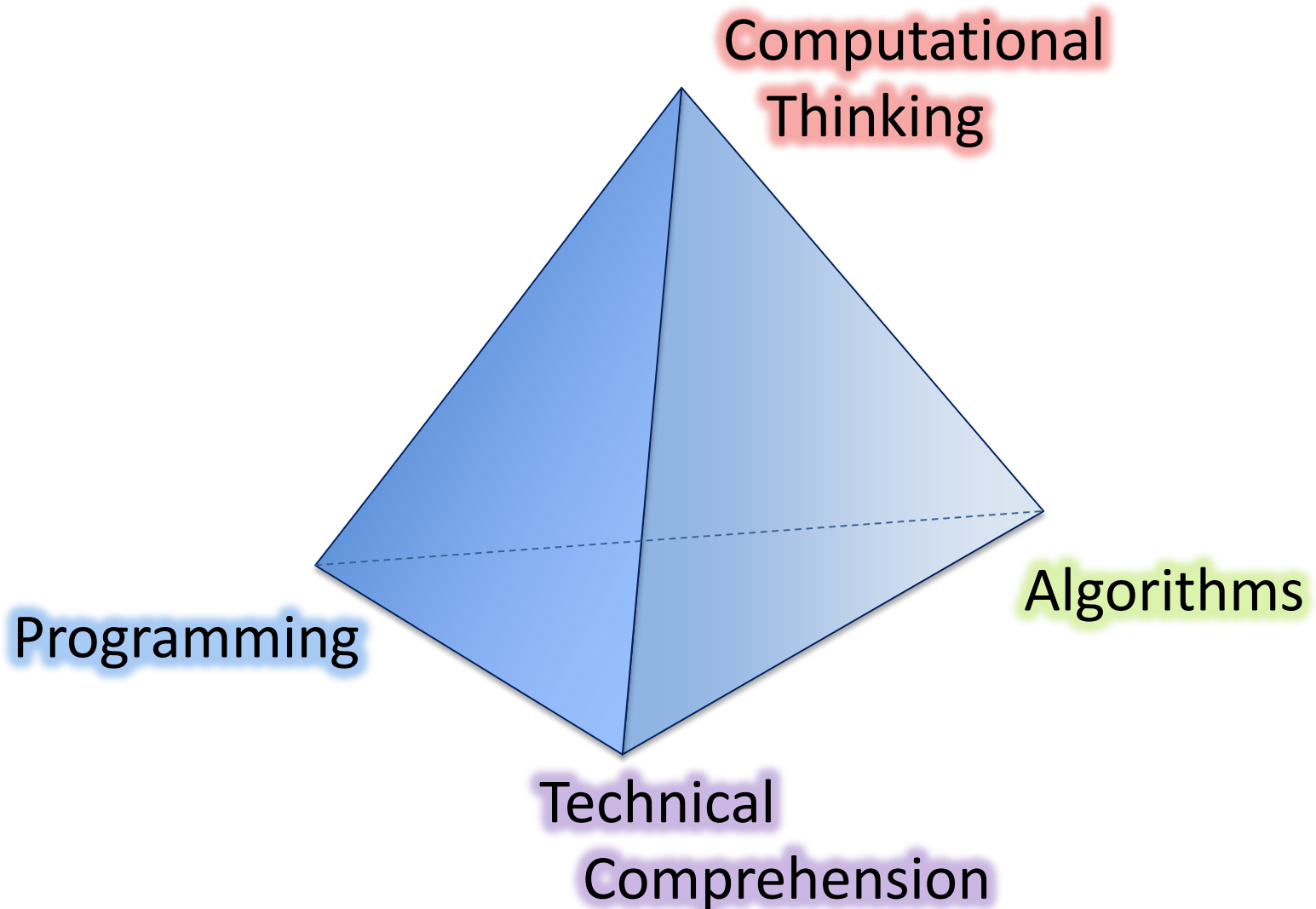
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<https://cs.cmu.edu/~15122>

Overview

- Goals of this course
- Interactions
 - Lectures, labs, recitations, office hours
- Assessment
 - Homework, exams, activities
- The course begins ...

Goals



Programming Skills

- Transforming algorithmic ideas into code
 - Code that works the first time around
 - *Deliberate programming*
 - ... well, *nearly* the first time around
 - Writing tests
- Imperative programming in C and C0
- Basic Unix skills

Algorithmic Knowhow

- Asymptotic complexity
 - time/space
 - worst case/average case/amortized analysis
 - important classes: $O(1)$, $O(\log n)$, $O(n \log n)$, $O(n^k)$, ...
- Important ideas like *order* and *randomness*
- Lots of fundamental data structures
(*Psst... this is often what tech interviews test on!*)

Computational Thinking

- From ***programmer*** to **computer scientist**
 - Systematic approach to solving a problem
 - Finding solutions that are *correct*
 - Finding solutions that are *efficient*

Technical Comprehension

- Learning to read technical specifications is an important skill you will be acquiring in this class
 - Problem statements will get longer
 - Dots to be connected will be further apart
 - + You will become more confident
 - + You will try more things on your own

The Big Picture

- Pre- or co-requisites
 - either 15-151 (Math Foundations for CS)
 - or 21-127 (Concepts of Mathematics)
- Counterpart
 - 15-150 (Principles of Functional Programming)
- Pre-requisite for
 - **15-213** (Introduction to Computer Systems)
 - 15-210 (Parallel and Sequential Data Structures and Algorithms)
 - 15-214 (Principles of Software System Construction)

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Lectures

- Tuesday and Thursday
- Please be here, please be active
 - ask and answer questions, pay attention
 - lecture notes, slides and online modules for review
- Laptops for note-taking only
 - In the back of the room unless you can't see the board
 - Too distracting for other students
 - No surfing, email, games, homework, ...

Labs and Recitations

- Labs Monday (programming exercises)
- Recitations Friday (review & written exercises)
- **Collaborative** problem solving
 - Help others if you are done early!
- How-to programming and tool support
- *Attend the lab/recitation you're registered for*

Getting-started Help

- Laptop setup office hours
 - Set up the C0 tools with Andrew Linux
 - Wednesday, 6 to 8pm in TBA
 - Drop in for half an hour
 - or do it yourself: “C0 at CMU” at <https://c0.cs.cmu.edu>
- Linux workshops
 - Learn useful Linux commands
 - Thursday, 7:30 to 9:30pm in TBA
 - or Tuesday 7 Sep, 4:30 to 6:30pm in TBA

Online Resources

- Course home page <http://cs.cmu.edu/~15122>
 - Schedule, calendar, contact info...
 - Lecture notes, slides, OLI modules
 - Links to all resources
- C0 home page <https://c0.cs.cmu.edu>
 - Tutorial, reference, examples, binaries

Online communication

- **Diderot** for announcements, questions, and communication with course staff
 - Get help, help each other!
- **Autolab** and **Gradescope** for homework
- Grades from web page
- Cluster Linux machines and SSH to shared machines for assignments

Help through the Semester

- **Office hours**
 - Calendar on course web page
 - Schedule coming soon
- Student Academic Success Center support
 - Supplemental Instruction: TBA
 - Peer Tutoring: TBA

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Assessment

- 50% - Exams (2 midterms and a final)
- 45% - Weekly Homework
 - *Written* due **Monday by 9pm ET on Gradescope**
 - No late days: 50% penalty if handed in by 8am Tuesday
 - ∞ submissions
 - *Programming* due **Thursdays 9pm ET on Autolab**
 - Download assignments and code from Autolab or Diderot
 - 3 late days, at most 1 per homework
 - Extensions only for emergencies
- 5% - In-class activities and lab participation
 - In-class activities in lectures
 - Attend, make a good effort, get credit

Written 1 already Out.
Due this Monday

Academic integrity

- Homework and exams *must be your own*
- **NOT OK:** discussing hw answers, sharing code
- **OK:** discussing course material, practice problems, blank assignments, study sessions, handed-back homework

If you make a mistake, come to us, don't let us come to you

How to do Well in this Course

- Do not stress over grades
- Participate
- Manage your time wisely
 - *Don't use late days in 1st half of course*
- Start homework early
- Get all the help you need
 - *ask for help, tell us when you're having trouble*
- Make time for fun

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