CSE 390B, 2024 Winter

Building Academic Success Through Bottom-Up Computing

Course Introduction

Welcome to CSE 390B!

Introduction to CSE 390B, Course Logistics, Project Overview

Lecture Outline

- ❖ **What is CSE 390B About?**
    - ▪ **Overview of CSE 390B**
    - ▪ **Why the Course Matters**
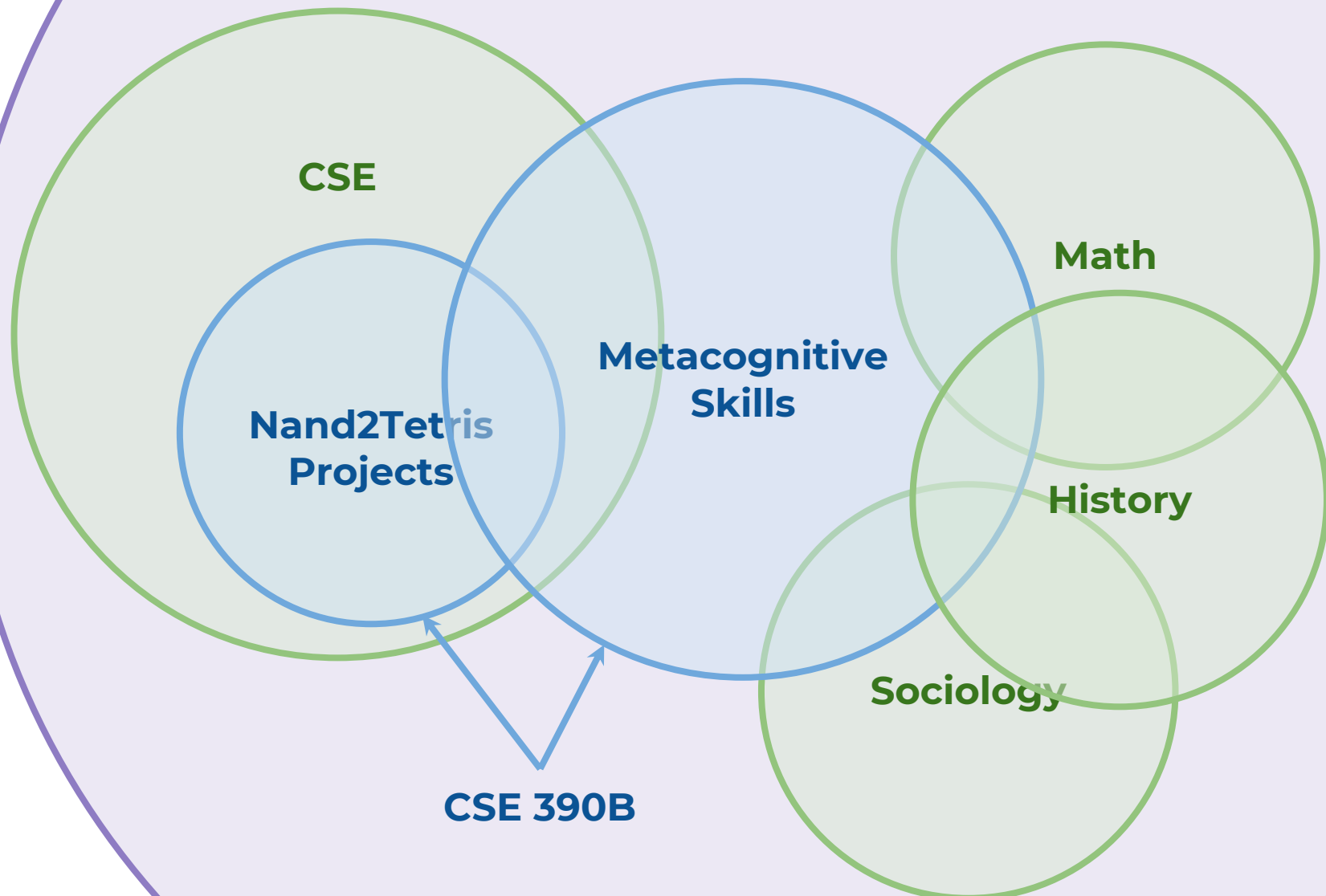
- ❖ Course Logistics
    - ▪ Lectures and Assignments
    - ▪ Course Policies and Resources

- ❖ Programming Project Series
    - ▪ Nand2tetris Overview
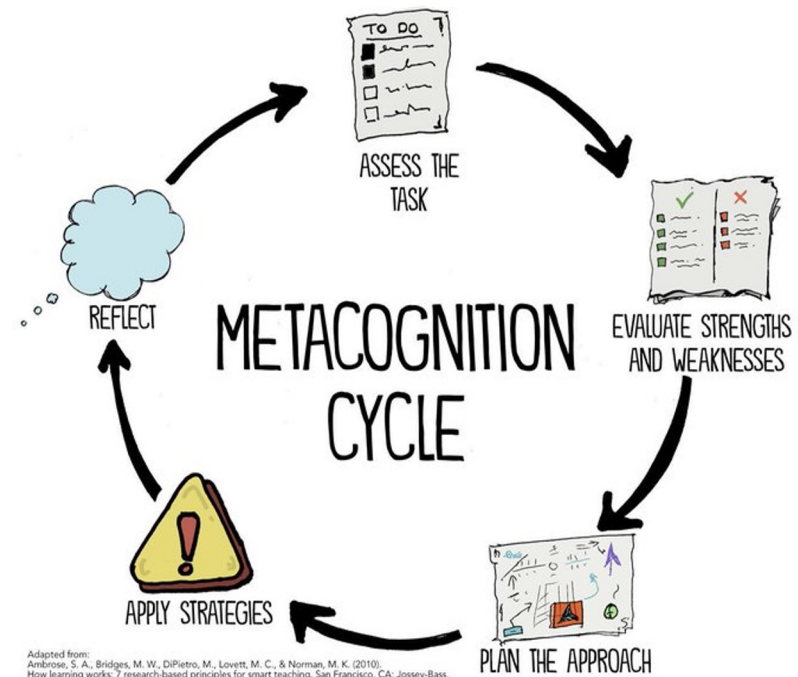   - ▪ Tools demonstration

What is CSE 390B?

Metacognitive Skills

❖ What does **metacognition** mean?
  ▪ Awareness of your thought process
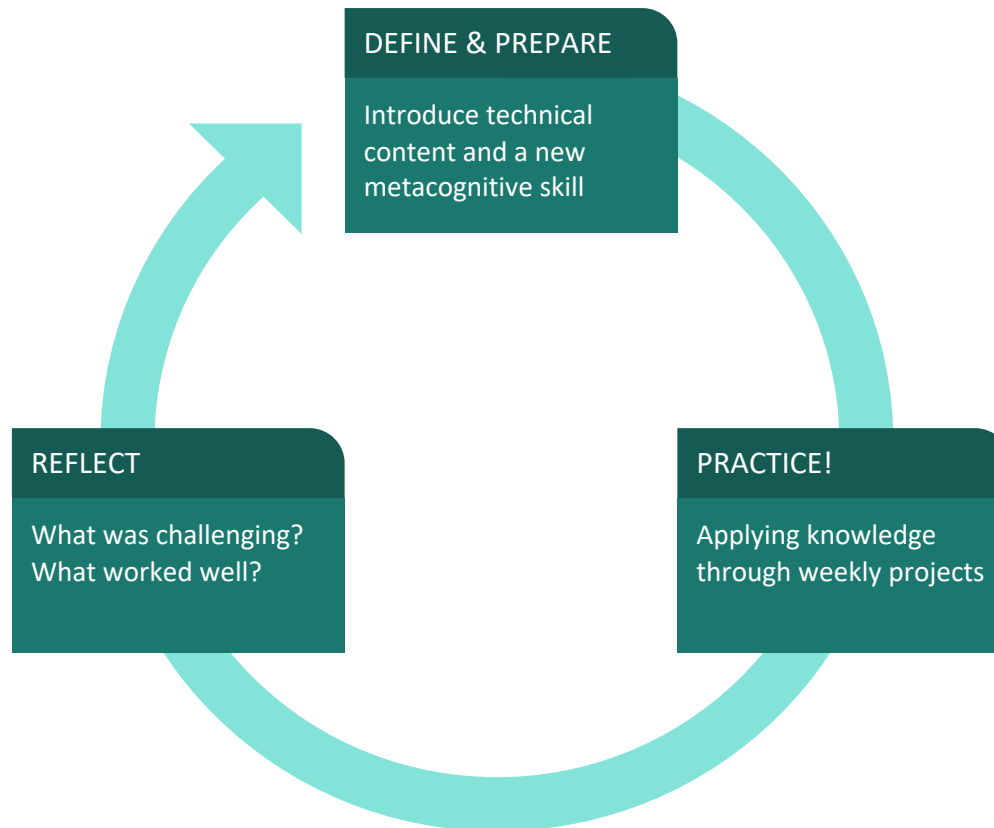
❖ Metacognitive skills we will cover:
  ▪ Time Management
  ▪ Annotation Strategies
  ▪ Exam Preparation
  ▪ Test-Taking
  ▪ Note-Taking
  ▪ Written & Oral Communication
  ▪ Testing & Debugging
  ▪ Design Decisions

TO DO

ASSESS THE TASK

EVALUATE STRENGTHS AND WEAKNESSES

REFLECT

METACOGNITION CYCLE

APPLY STRATEGIES

PLAN THE APPROACH

Adapted from:
Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010).
How learning works: 7 research-based principles for smart teaching. San Francisco, CA: Jossey-Bass.

The Connection

❖ How do the different elements of practicing metacognitive skills and working on technical projects connect?

DEFINE & PREPARE

Introduce technical content and a new metacognitive skill

PRACTICE!

Applying knowledge through weekly projects

REFLECT

What was challenging? What worked well?

Sneak Peek of CSE 390B

❖ Fascinating question:
  ▪ What happens under the hood when code runs?

❖ Fascinating answer:
  ▪ Many layers of abstraction, each with its own answer

❖ Nand2tetris: Project for exploring bottom-up layers
  ▪ Can do everything with NAND gates and input / output

❖ An empowering, coordinated, broad look at "how computers really work"
  ▪ Closest to the Hardware / Software Interface CSE 351 but lower level, with elements from Digital Design (CSE 369), Operating Systems (CSE 451), and Compilers (CSE 401)

Why Does CSE 390B Matter?

❖ Technology is based on bottom-up computing
  ▪ Learning how computers work is foundational to computer science
  ▪ You'll see the birds-eye view of computer science and understand how your courses fit into the big picture

❖ This course equips you with a toolbox
  ▪ A CSE degree isn't just about learning technical concepts
  ▪ A college education is also about preparation for a career and your future (collaboration, organization, etc.)

❖ This course empowers you to explore
  ▪ You will become independent learners and be autonomous in your learning for future UW courses and beyond

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  ▪ **Course Policies and Resources**

❖ **Programming Project Series**
  ▪ Nand2tetris Overview
  ▪ Tools demonstration

Succeeding in CSE 390B

❖ This course will have frequent assignments and move through many topics
- Stay organized, falling behind makes it difficult to catch up
- You will not be successful in this course if you wait until the day before to do your assignments

❖ This course rewards participation
- Lecture participation is expected
- In-class activities are meant to help you with your weekly projects

❖ Like other college courses, earning a good grade requires that you put in the effort
- What you get out of the course is what you put in
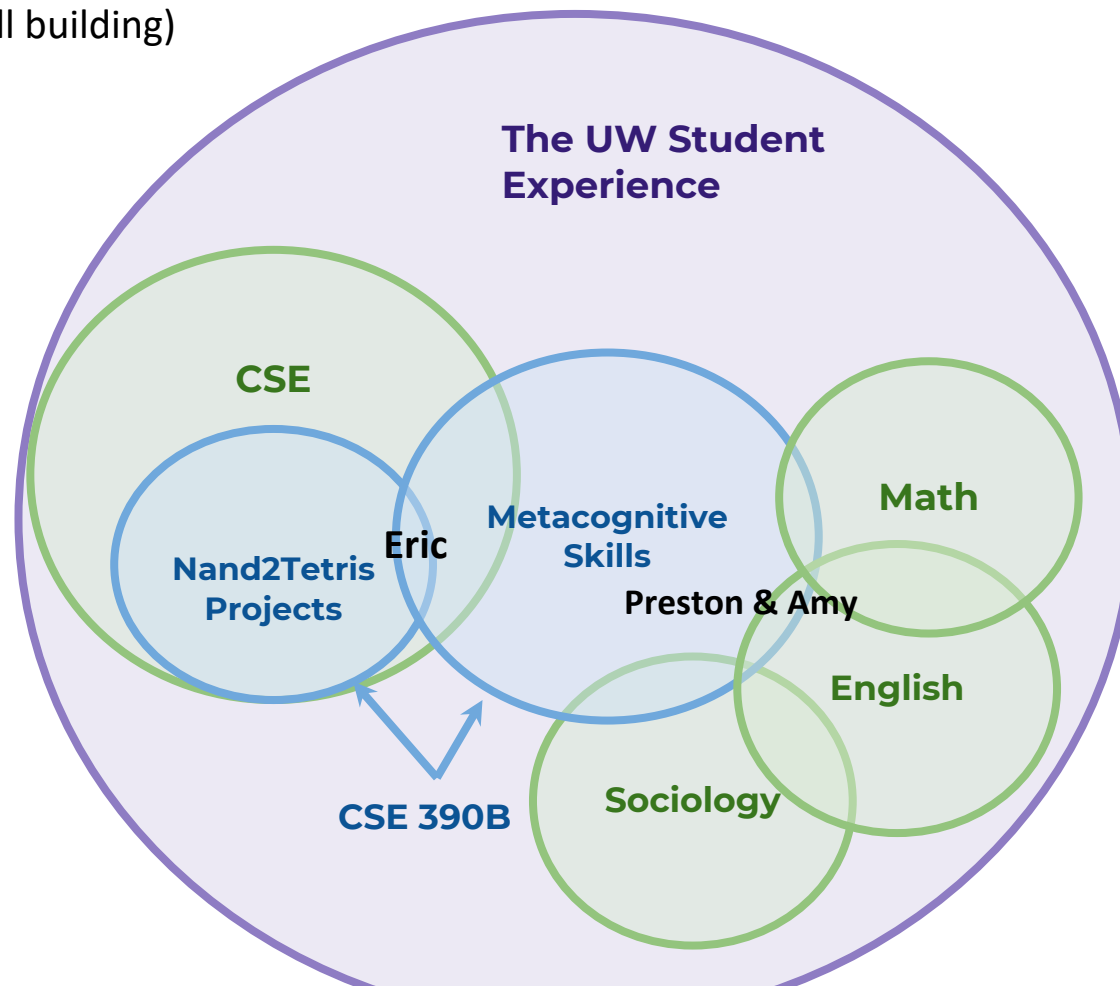- We expect students to work hard and give their best effort

Course Staff Roles

Eric

Teaching the technical (bottom-up computing) and metacognitive (academic skill building)

Preston and Amy

Weekly TA meetings as a touch point in practicing the application on course concepts and study skills

Grading Breakdown

❖ 40%: A sequence of eight projects
- ▪ Each will have a metacognitive and technical, programming component
- ▪ Projects will be assigned on Fridays and generally due the following Friday

❖ 20%: Midterm Exam

❖ 20%: Final E-Portfolio Project & Presentation

❖ 20%: Participation
- ▪ 10%: Lecture attendance and Poll Everywhere questions
- ▪ 10%: Student-TA meeting attendance and engagement

Academic Integrity

❖ Work to be completed and submitted **individually**
  ▪ Do not share your solutions with others

❖ Collaboration allowed and encouraged, but discussions must be at a high-level
  ▪ You may share implementation strategies and debugging tricks, but NOT lines of code or your entire solution

❖ Do not seek answers or solutions from those not in the class or from the website

❖ If you have any questions about what is considered academic integrity or not, please ask the course staff

Student-TA Meetings

❖ Weekly 1:1 Student-TA Meetings

- A required element of the course (factored into participation grade)
- 45 minutes each week (the first meeting will be one hour)
- 1:1 Student-TA meetings will begin Week 2 based on the availability of you and the TA

❖ Student Expectations

- Come prepared, on time, and ready to discuss with your TA
- Tardiness, absences, or frequent rescheduling will negatively impact your participation grade

Lecture Polling

❖ A way for you to instantly practice and solidify the concepts covered in lecture
  ▪ Research shows the act of thinking about an application question is a highly effective way to learn

❖ Factored into participation grade (completion only)

❖ We will be using Poll Everywhere
  ▪ Sign up now for an account at https://pollev.com/
  ▪ Requires SSO log-on

When poll is active respond at

PollEv.com /cse390b

Send **cse390b** to **22333**

How will Poll Everywhere be used in lectures?

0

SEE MORE

Late Policy

❖ **Five late days** for the quarter
  ▪ Do not need to tell the course staff ahead of time
  ▪ Maximum of two late days can be used per project

❖ *Guaranteed* to pass if you earn a raw score of at least 50% on each project, all submitted by the end of the quarter
  ▪ Importance of staying persistent and resilient

❖ In extenuating circumstances, you may ask for an extension
  ▪ Only considered if the request is made before the project deadline
  ▪ See syllabus for extension request instructions

❖ 10% deduction per additional late day

Course Resources

❖ Course Webpage
  ▪ Main source for everything related to CSE 390B
  ▪ Includes syllabus, course calendar, project specifications, and all the relevant resources for the course

❖ Canvas
  ▪ Access to lecture recordings via Panopto
  ▪ Check remaining late days (updated after every project)
  ▪ Accessing necessary resources for projects

❖ Gradescope
  ▪ Where you will submit the metacognitive parts of the projects
  ▪ You will receive your project grades and feedback here

Course Resources

❖ **GitLab**
  - Project distribution and submission of technical, programming parts of the projects

❖ **Ed Discussion Board**
  - The place to ask and answer questions related to the class (logistics, projects, general questions, etc.)
 - Course staff will post announcements here

❖ **Email the course staff: cse390b-staff@cs.washington.edu**
  - You may also reach the course staff over email if you'd like
  - Usually a faster response over email

Course Resources

❖ Located in one of the TA offices

❖ A space for you to ask questions and receive help on technical projects and metacognitive concepts

❖ Feel free to also stop by to just work on projects or say hello!

❖ Office hours times and location posted on the course calendar
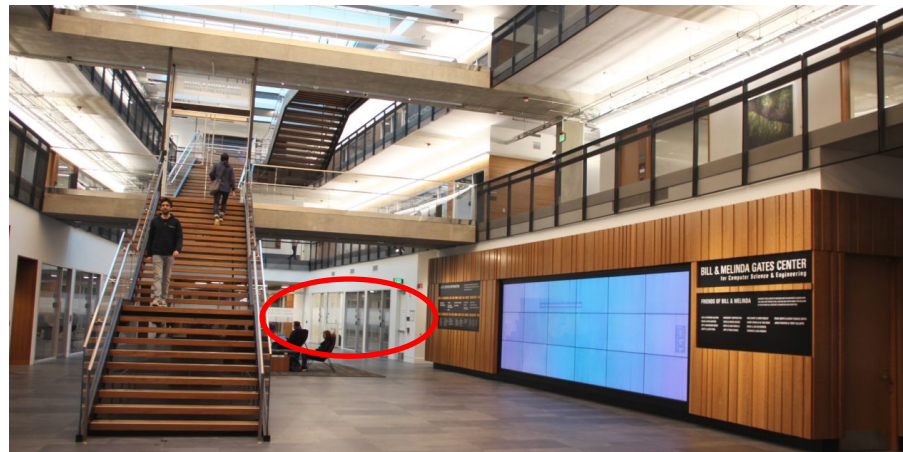
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❖ **Programming Project Series**
  ▪ **Nand2tetris Overview**
  ▪ **Tools demonstration**

Programming Project Series

❖ nand2tetris
  ▪ You will build an entire (simulated) computer
  ▪ Source: Single hardware logic gate
  ▪ Destination: A computer program that runs a game of Tetris
  ▪ Topics: Hardware concepts (Boolean logic, sequential logic, computer chips, etc.), low-level software, fundamentals of operating systems, virtual machines, compilers
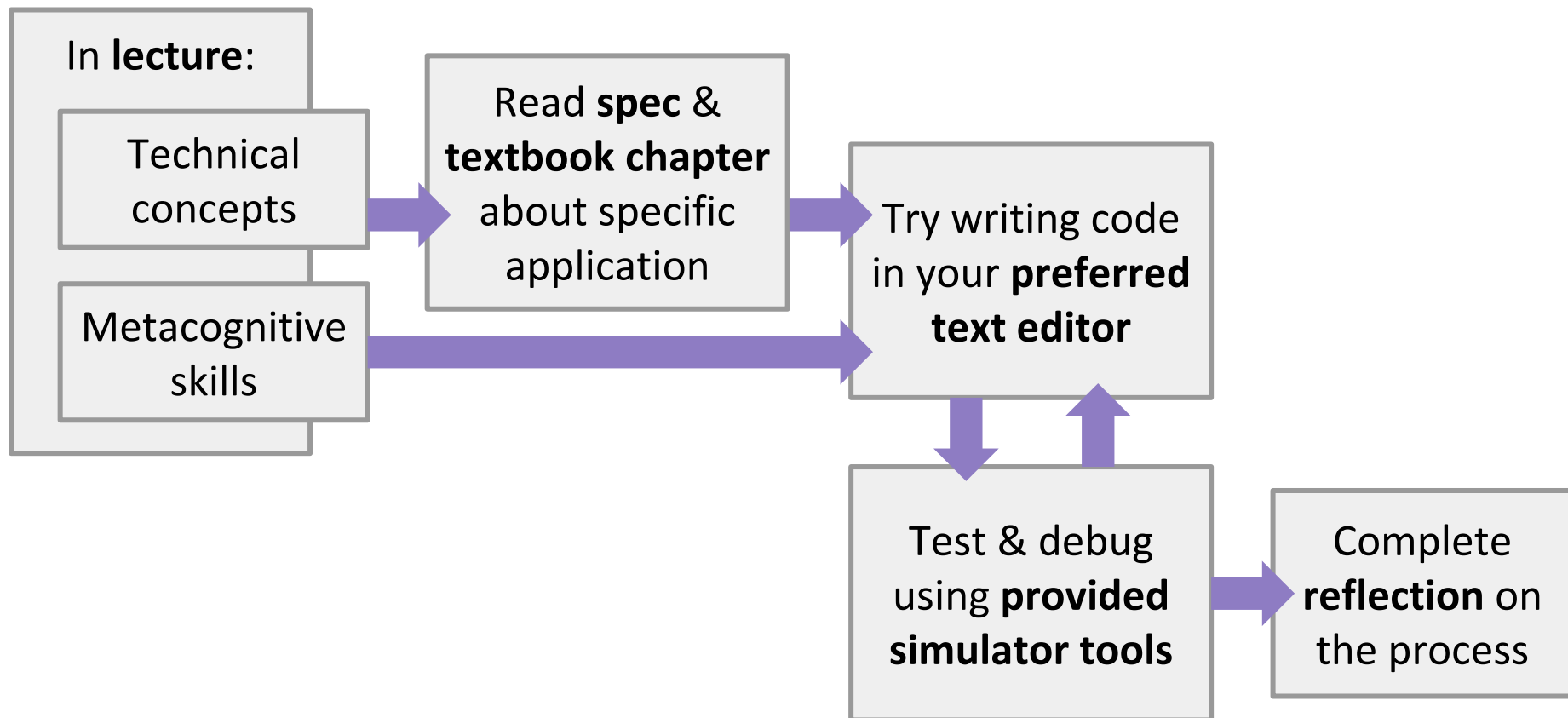
❖ Acknowledgements
  ▪ Projects adapted from the open-source nand2tetris curriculum
  ▪ Everything you need will be distributed by the course staff

Programming Project Series

❖ Getting your assignments: you will have your own GitLab repository for the quarter
   ▪ For distributing starter code
   ▪ Used for organizing and submitting your projects

❖ Specifications, textbook chapters, and references will be on the course website
   ▪ We'll provide the instructions you need for using Git

❖ We will generally grade a project by the date the next project is due (approximately one week after the deadline)

Programming Project Series

❖ Roadmap for completing the programming projects:

In **lecture**:

Technical concepts

Metacognitive skills

Read **spec** & **textbook chapter** about specific application

Try writing code in your **preferred text editor**

Test & debug using **provided simulator tools**

Complete **reflection** on the process

Project 1 Overview

❖ Programming Component: **GitLab Setup**
- Will help prepare you for future CSE 390B projects

❖ Metacognitive Component: **Course Resources Worksheet** and **Project 1 Reflection**
- Organize your resources for this quarter
- Identify key learning resources that you will be accessing throughout the quarter

❖ Estimated time to complete: 1–2 hours

❖ **Project 1 due this Friday (1/5) at 11:59pm**

Project 1 Demo

1. Understanding and using Git
2. Find your CSE 390B GitLab Repository
3. Add your SSH Key
4. Explore the starter code using your favorite editor
5. Make a commit

Steps outlined in detail in Project 1 webpage

Post-Lecture 1 Reminders

❖ **Project 1 due this Friday, 1/5 at 11:59pm**

❖ Please post on the Ed discussion board any questions you have from Project 1

❖ See you all this Friday! 👋