

University at Buffalo · Fall 2026

CSE589

Modern Network

Concepts

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Department of Computer Science and Engineering

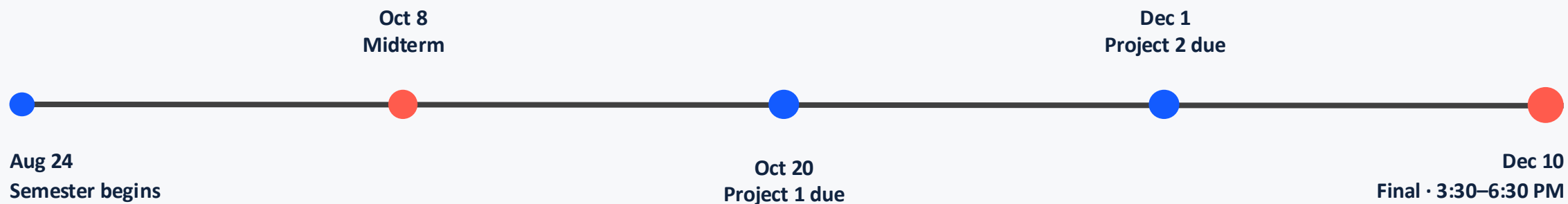
Your semester, at a glance

2:00–3:20

Tuesday + Thursday

97

**Alumni Arena
North Campus**



97 Alumni Arena

Leave able to reason, build, and diagnose

01



Reason

Explain layered architecture, protocol mechanisms, and design trade-offs.

02



Build

Implement networked applications and protocol behavior across layers.

03



Diagnose

Measure performance, find failures, and defend conclusions with evidence.

Understand why networks work—and when they do not.

Your first point of contact



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For course questions, start on Piazza.

Use the channel that matches the question

01 ○

Piazza

Questions, announcements, class discussion

piazza.com/buffalo/fall2026/cse589/home



02 ○

UBLearns

Access code, grades, official submissions

Access code appears in Announcements

03 ○

Course site

Schedule, lecture slides, policies

xieyaxiongfly.github.io/CSE589_fall_2026

04 ○

Email

Private, personal, or accommodation-related matters

yaxiongx@buffalo.edu

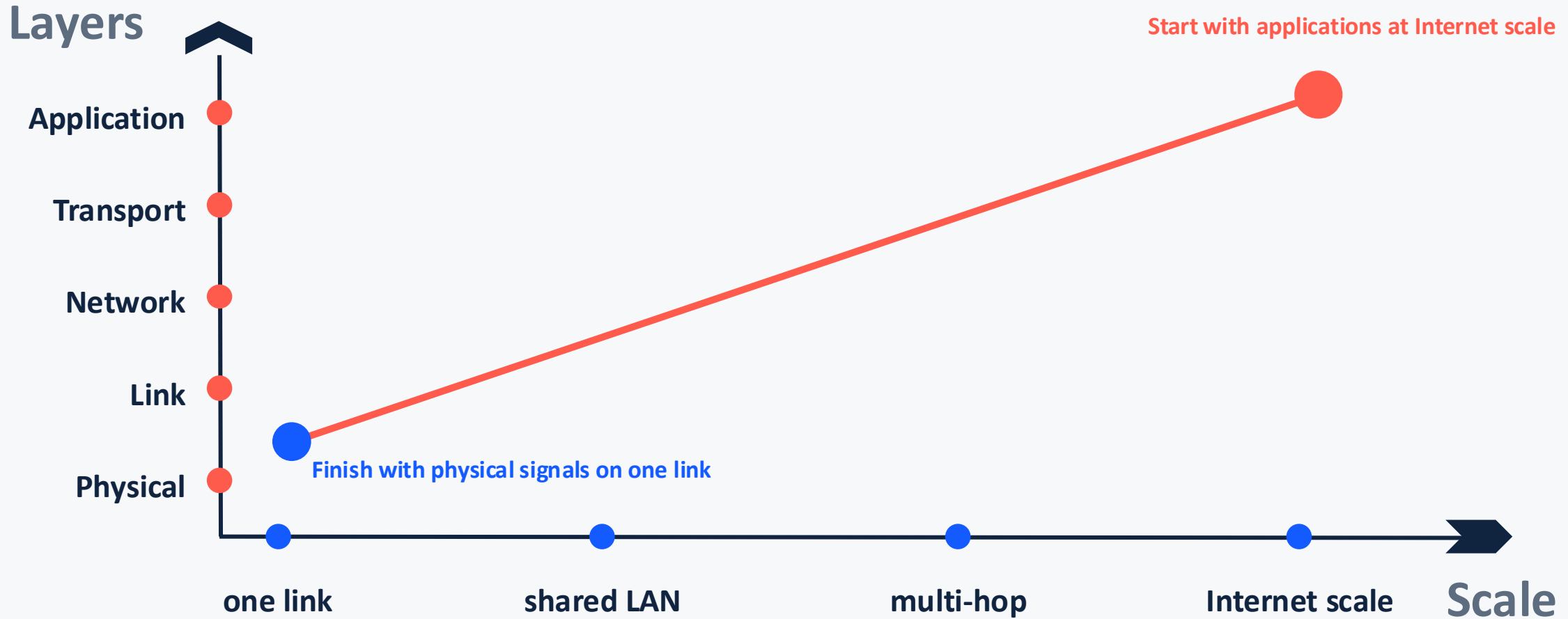
01

Course Content: Start with the application

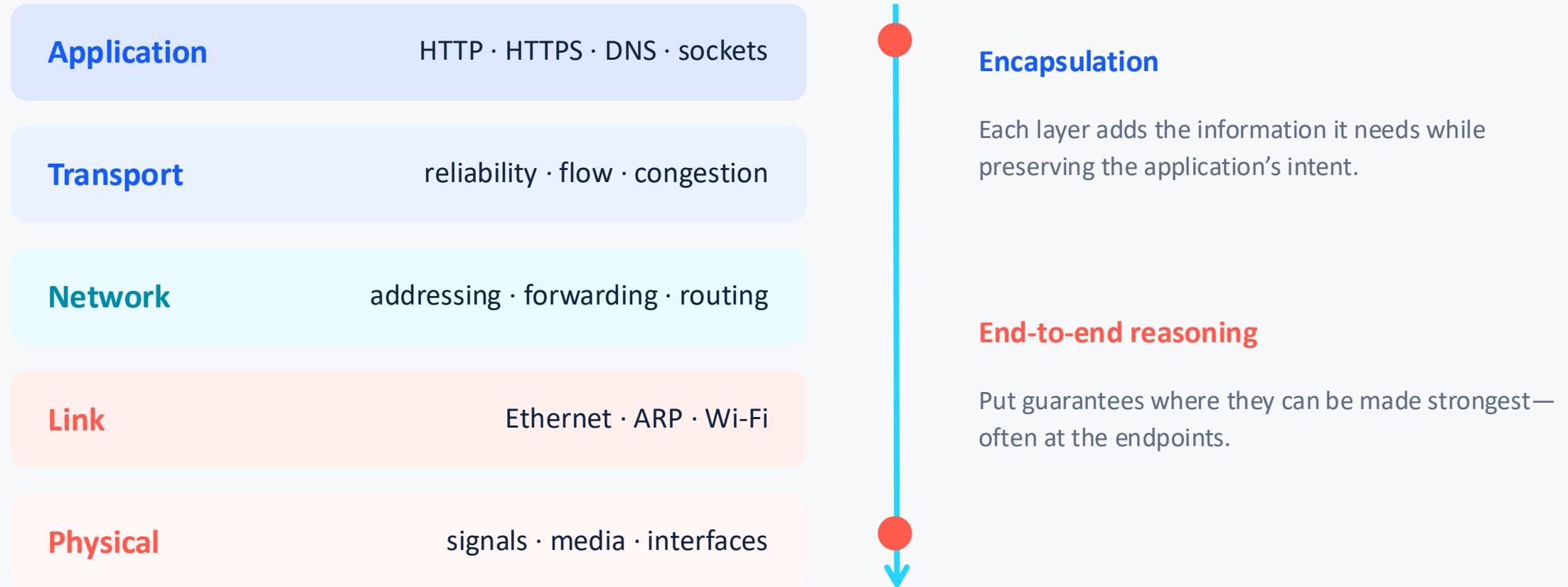
Begin with familiar applications.
Then follow packets down to physical transmission.



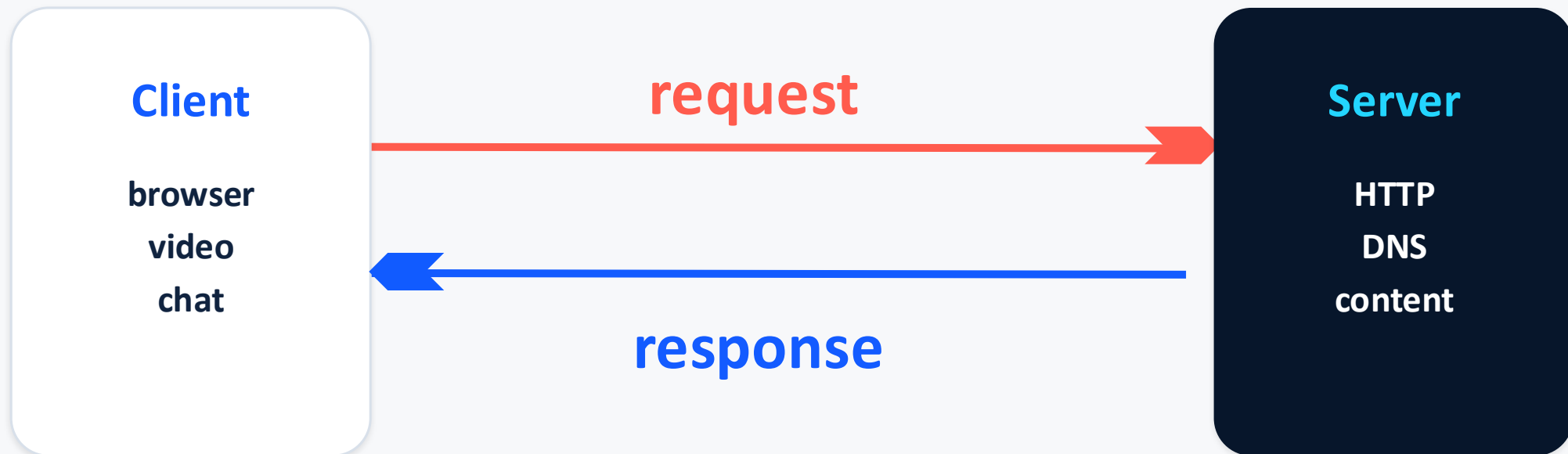
The course moves from applications down the stack



We follow each packet from application to physical



Applications feel simple because protocols hide the network



Sockets are the boundary between application logic and transport services.

Reliability is engineered—not assumed

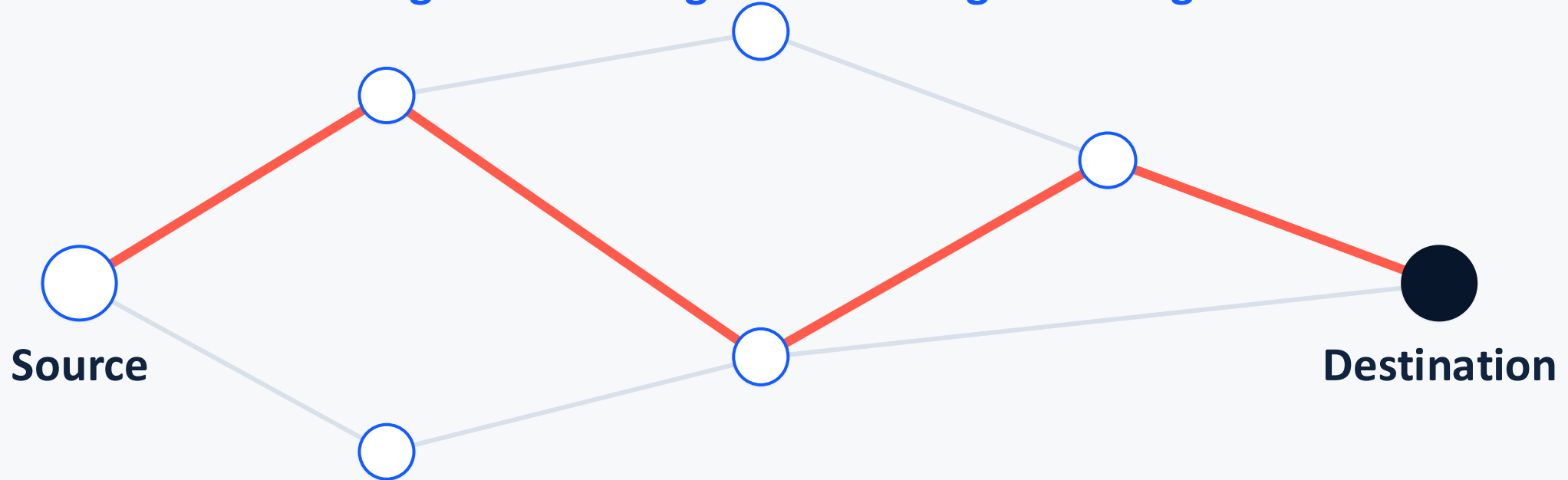
ACKs · timers · retransmission · flow control · congestion control



Transport protocols turn loss, delay, and reordering into a usable service.

Routing turns local decisions into a global path

IP addressing · subnetting · forwarding · routing · NAT · ICMP



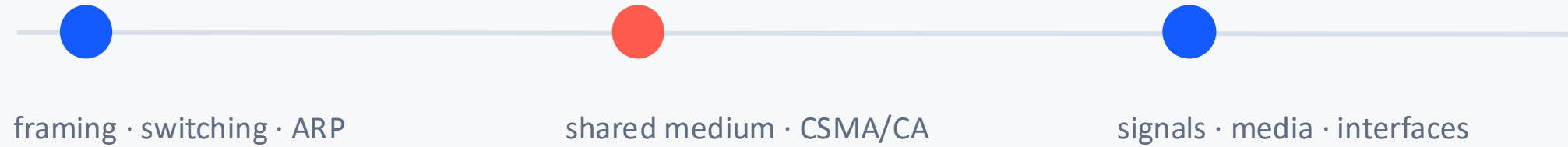
Every router sees only part of the network. Protocols coordinate those partial views into paths.

The last hop is where sharing, mobility, and signals meet

Ethernet

Wi-Fi

Physical media



A packet is only useful when it reaches the right device, over the right medium, with a usable signal.

Measurements turn symptoms into evidence

Throughput



How much arrives?

Latency



How long does it take?

Loss



What never arrives?

Jitter



How stable is the delay?

Tools

ping · traceroute · iperf · tcpdump

Observe → form a hypothesis → test → explain

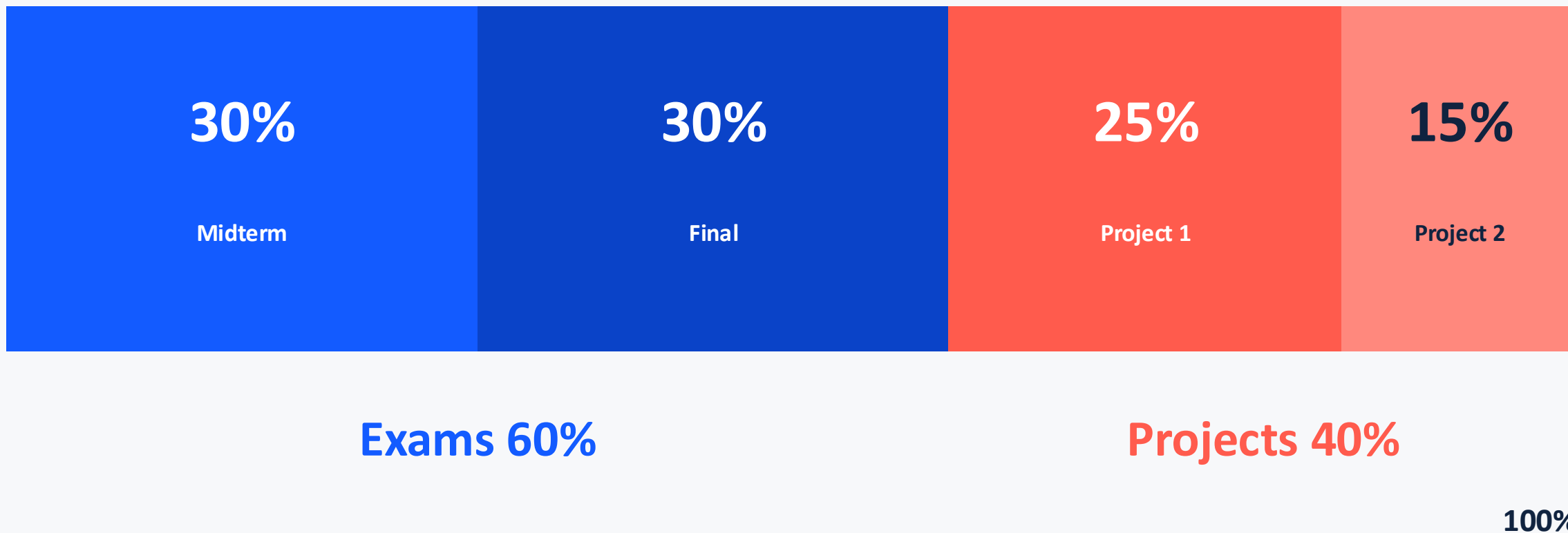
Know how you are assessed

Two exams. Two projects.
Clear milestones across the semester.

30% 30% 25% 15%

Midterm Final Project 1 Project 2

Every percentage has a clear job



CSE 489 and CSE 589 are evaluated separately

Undergraduate

CSE 489

Students enrolled in CSE 489 are evaluated together as the undergraduate course cohort.

Graduate

CSE 589

Students enrolled in CSE 589 are evaluated together as the graduate course cohort.

The two course populations are evaluated separately.

Letter grades follow published score bands

A to C+

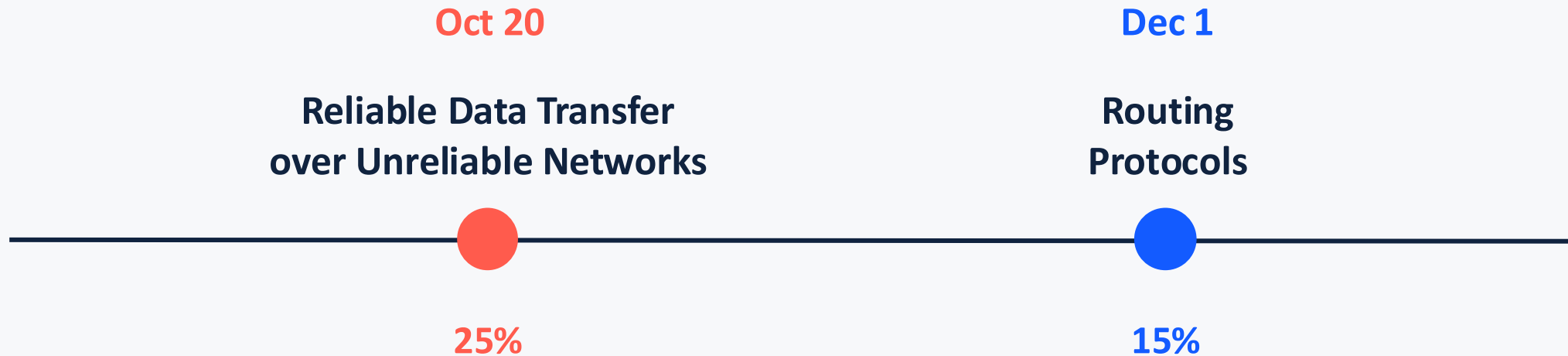
93–100	A
90–92.99	A–
87–89.99	B+
83–86.99	B
80–82.99	B–
77–79.99	C+

C to F

73–76.99	C
70–72.99	C–
67–69.99	D+
63–66.99	D
60–62.99	D–
Below 60	F

Cutoffs may be **lowered**—but will not be raised—based on overall class performance.

Two projects turn protocol ideas into working systems



One submission and one grade per team. Detailed requirements are posted with each project.

The exams anchor the middle and end of the course

Midterm · 30%

**Oct
08**

Thursday, 2026

Review: Tuesday, Oct 6

Final · 30%

**Dec
10**

Thursday, 2026

3:30–6:30 PM

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**Block the full final-exam window now. Make-up exams
require a valid excuse.**

Stable teams and steep penalties reward planning

Teams

**Up to
2**

Programming projects only
Teams form early
Teams normally remain fixed
One submission · one grade

Late work

7

days maximum

–10% of total points per day
Day 7: at most 30%
After day 7: zero points

If a serious team issue or extraordinary circumstance develops, contact the instructor as early as possible.

Raise grading questions promptly and privately

Review

01

Read the grade and feedback in UBLearns.

Ask

02

Send a private Piazza post within one week.

Explain

03

Identify the exact issue and supporting evidence.

Resolve

04

Contact the instructor if further review is needed.

Requests submitted after the stated deadline will not be considered.

Ideas can travel. Answers and source code cannot.

Discuss

- course concepts and examples
- work with your assigned teammate
- references with clear citations
- uncertain boundaries with the instructor

Never share

- completed answers or reports
- source code across teams
- previous-semester solutions
- a peer's repository or submission

You are responsible for what you submit—and what you allow others to access.

Use AI to clarify—not to complete

Learning

AI may help you...

- understand a concept
- clarify terminology
- review course material
- ask general learning questions

Submission

AI may not...

- solve a homework or project question
- generate code or answers for submission
- complete any graded course work
- replace your reasoning or implementation

If AI is working on the course problem, it has crossed the line.

Early communication creates options

**Tell me
early**

Whenever possible, contact the instructor before a missed exam or deadline.

01 Missed exam

Make-up exams require a valid excuse.

02 Medical request

Provide documentation describing the affected period.

03 Accessibility

Contact the instructor and UB Accessibility Resources during the first two weeks.

Medical emergencies are reviewed case by case. Silence after a deadline limits the available options.

Four actions will start the semester well

Join

01

Piazza
Access code in UBLearn

Verify

02

Time, room, exam dates
Course website

Set up

03

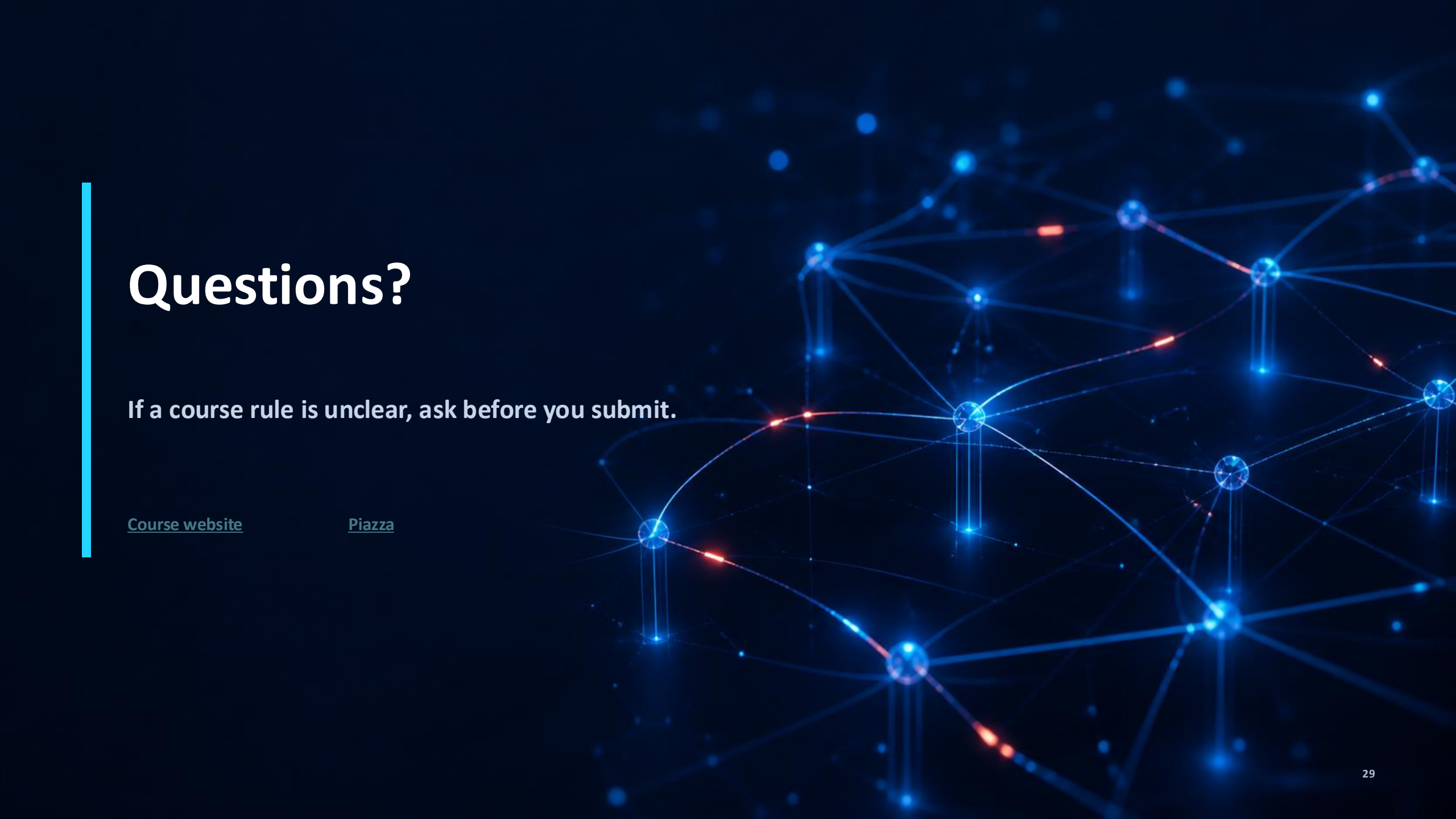
Unix/Linux environment
Programming tools

Ask

04

Clarify rules early
Use the right channel

Start early. Practice actively. Ask before a small problem becomes a deadline problem.



Questions?

If a course rule is unclear, ask before you submit.

[Course website](#)

[Piazza](#)