CS 571 Building User Interfaces

Course Introduction

Prof. Yuhang Zhao
Computer Sciences, UW-Madison

Instructor: Yuhang Zhao

- Assistant Professor of Computer Sciences
  - PhD, 2020, Cornell Tech, Cornell University
- Research direction
  - HCI, Accessibility, AR/VR, mobile interaction
- Mad Ability Lab
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- Contact
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HORIZON
SNACK
CRACKERS
Cheetos
Onion rings

Oculus

Oculus

Instructional Team

TAs

Brandon Cegelski, Ru Wang

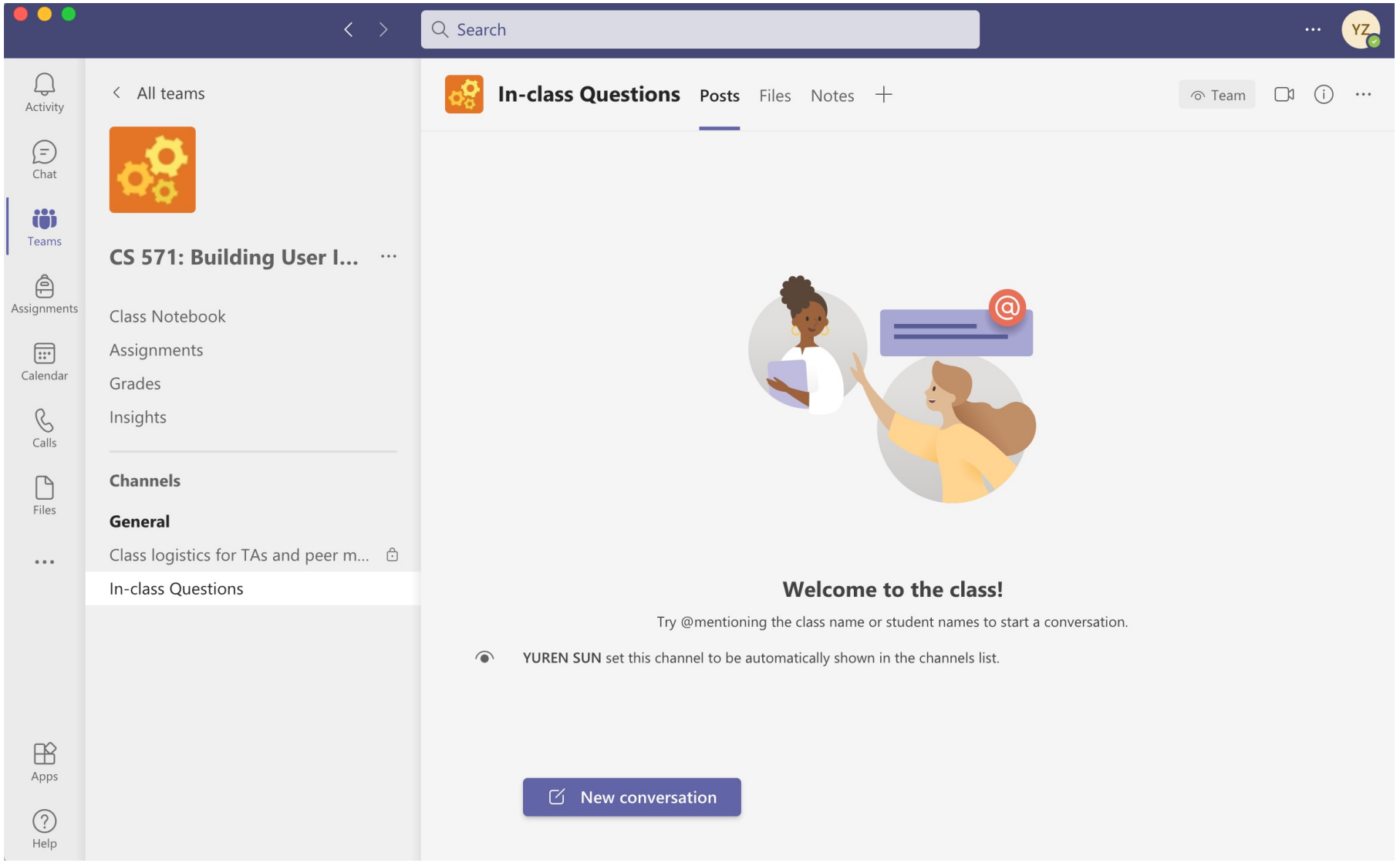
Peer Mentors

Ilkyu Ju, Nick Winans

Live Q&A

Microsoft Teams

Join Code: **i5v4dwf**. Click *Create and join teams* below your teams list and look for the *Join a team with a code card*.



What is this course about?

UX Development

But, what is *UX development*?

FRONTEND
DEVELOPMENT
(in 2 min)

The realm of the UX developer exists somewhere between that of the *traditional developer* and the *designer*. We're not really designers, yet to be a good UX developer you certainly need to have an eye for design. In the same vein, we're not traditional developers but we certainly need to have development experience and expertise. Often this experience spans multiple technologies, languages, and platforms.

— Tim R. Todish

It falls on the UX developer to bridge the gap between design and technology. We need to be able to think and speak the language of designers. It’s our job to help translate their vision to the development team in a way that they can understand and accept. This can be a critical piece of the puzzle in a project, especially if the design and the interactions behind it are complex.

— Tim R. Todish

Similarly, we need to speak on behalf the developers to help reign in the designers, at times. If they are coming up with concepts that will be extremely difficult or time consuming to implement, we can explain the limitations of the technology and the complexity involved in implementing their designs, and try to come up with an acceptable alternative.

— Tim R. Todish

UX Development →
software engineering + UX design

What does a software engineer do?

which is devoured in a
large quantity.

Definition: A software engineer is a person who applies the principles of software engineering to the design, development, maintenance, testing, and evaluation of computer software.

What are the *principles* of software engineering?

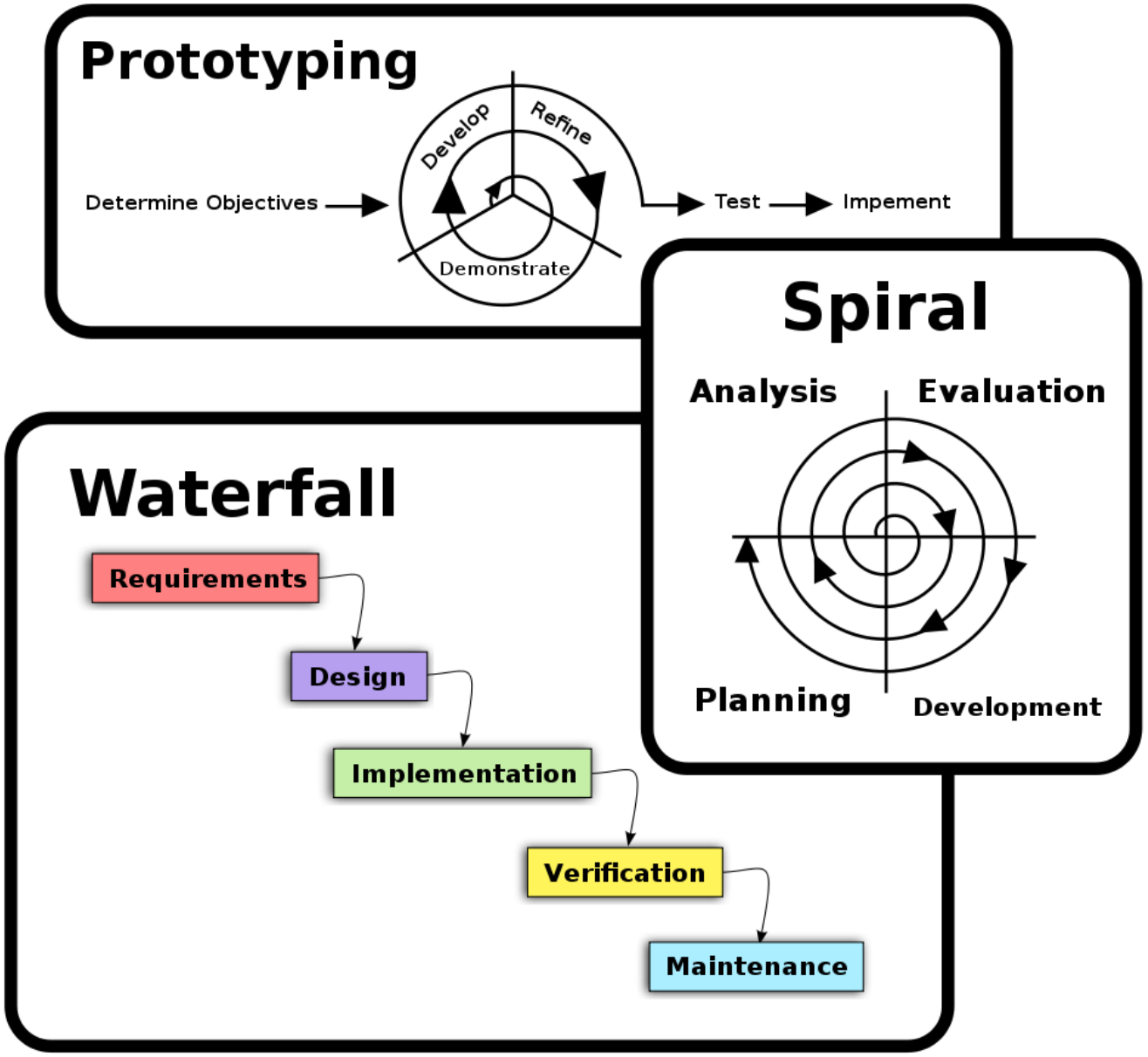
[Wikipedia: Software engineer]

Pro Tip: Principles of software engineering include:

1. Separation of concerns
2. Modularity
3. Abstraction
4. Anticipation of change
5. Generality
6. Incremental development
7. Consistency

[Principles of software engineering]

Software development process



[Wikipedia: Software development process]

What does a UX designer do?

Definition: User experience (UX) design is the process that design teams use to create products that provide meaningful and relevant experiences to users.

A *UX designer* is concerned with the entire process of acquiring and integrating a product, including aspects of branding, design, usability, and function.

What does this *process* involve? Can anyone name a step?

Interaction Design Foundation

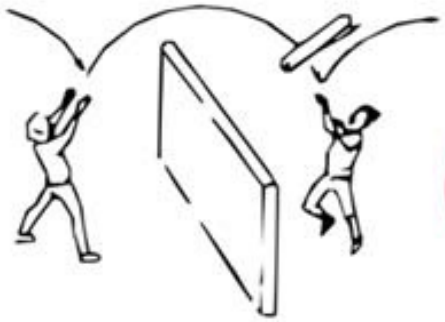
Pro Tip: UX design usually involves the steps:

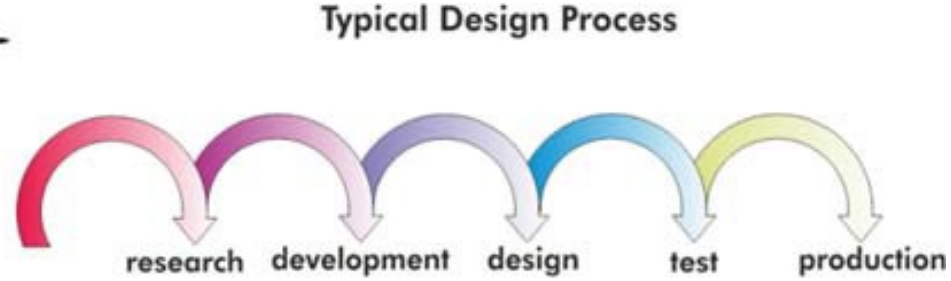
1. Empathize
2. Define
3. Ideate
4. Prototype
5. Test
6. Implement

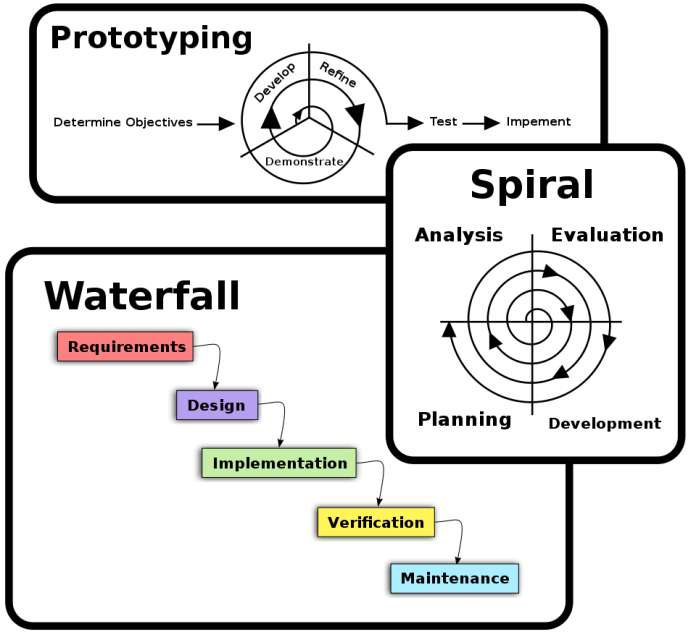
Wait a minute! Some of these steps sound familiar!

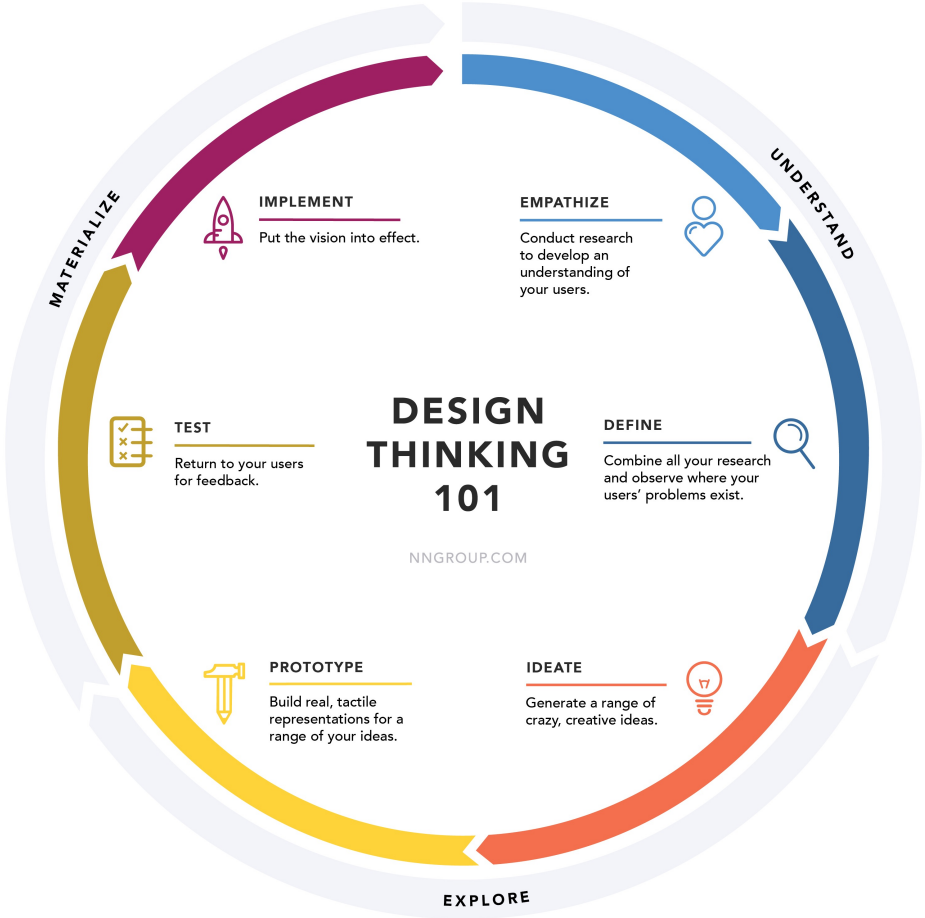
NN/g Design Thinking

Design process sources



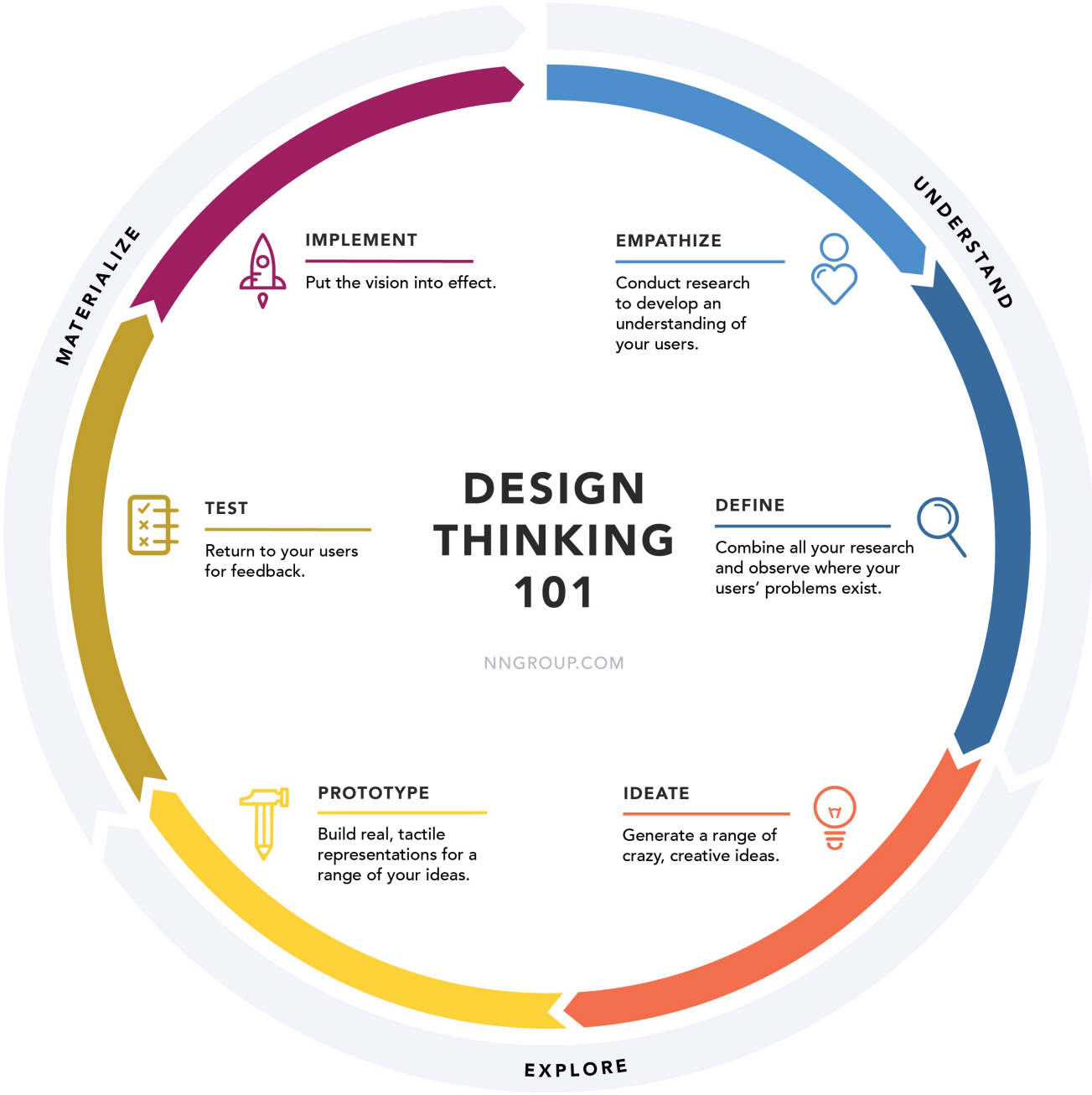






[Reed & Bohemia, 2011](), [NN/g Design Thinking]()

A Process for UX Development



UX Development Trajectories

- One-person development team to build full-stack applications
- A developer who speaks the language of the designers
- A designer who can also build native prototypes
- A bridge/translator between designers and developers in large/complex organizations

WHY DO UX
DEVELOPERS
MAKE SO MUCH?
CHRIS HAWKES -CodeHawke.com

CAREER
ADVICE
FRONT-END
DEVELOPER
OR UX DESIGNER?
ML UX ACADEMY

User Ex rience
In Dev pment

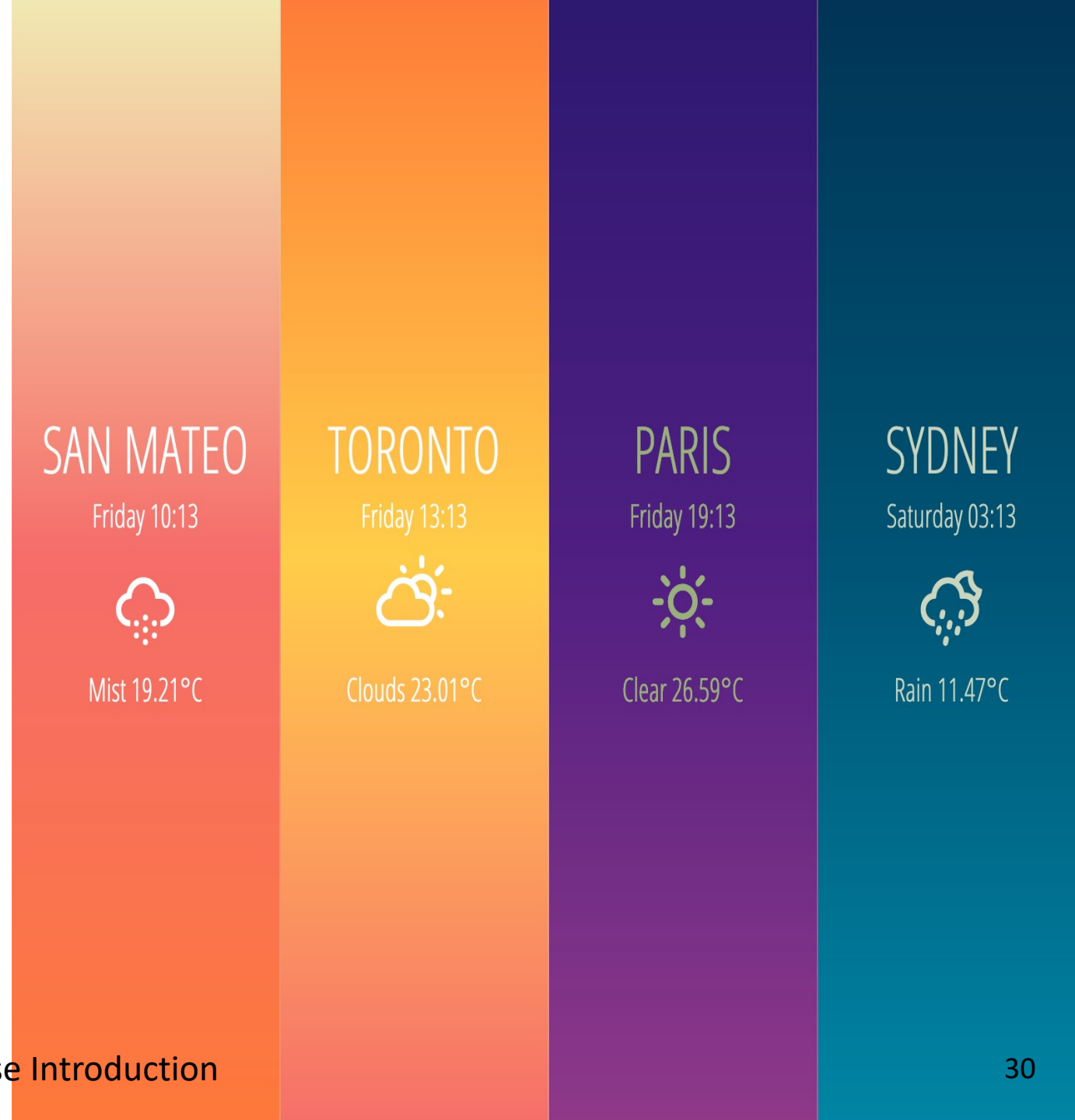
FRONT-END
CAREER ADVICE
with Nick from GA

Videos: 1, 2, 3, 4

Ok, 👍, but what can I do as a UX developer?

Example 1: Clocks

- Binary clock
- World clock



React Examples

Example 2: Musical Instruments

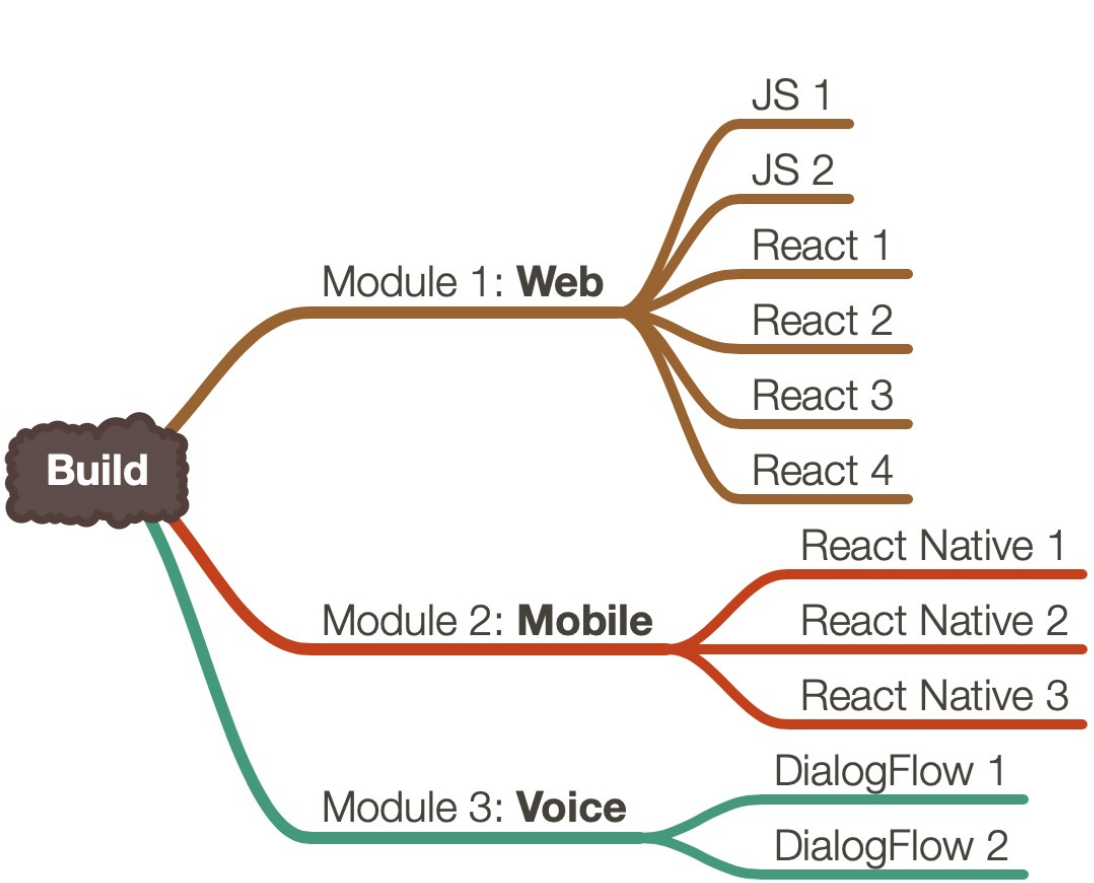
- Xylophone
- Electric guitar

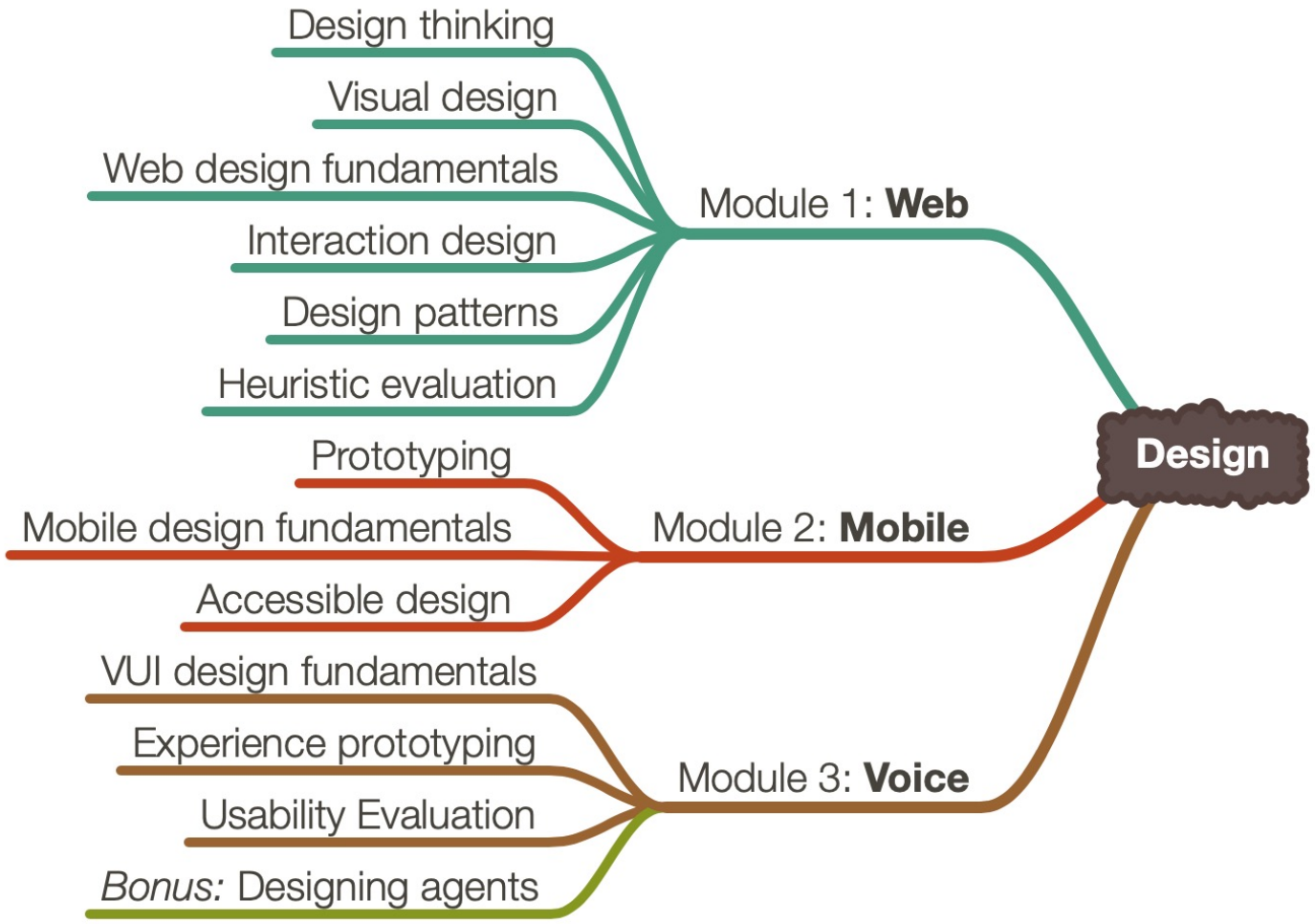
CSS Tricks: Introduction to Web Audio API

Questions about the Course Topic?

Course Mechanics and Logistics

Image sources: left, right


Build
Module 1: Web
JS 1
JS 2
React 1
React 2
React 3
React 4
Module 2: Mobile
React Native 1
React Native 2
React Native 3
Module 3: Voice
DialogFlow 1
DialogFlow 2


Design
Module 1: Web
Design thinking
Visual design
Web design fundamentals
Interaction design
Design patterns
Heuristic evaluation
Module 2: Mobile
Prototyping
Mobile design fundamentals
Accessible design
Module 3: Voice
VUI design fundamentals
Experience prototyping
Usability Evaluation
Bonus: Designing agents

Build

- We will learn the most popular implementation frameworks/libraries for each platform:

1. Web–*JavaScript, React*
2. Mobile—*React Native*
3. Voice—*DialogFlow*

Mostly introductory, but these will get you started.

This is a 500-level class, so there will be a lot of self-exploration!

Design

- We will learn design methods and techniques that will give you the best bang for the buck. Examples:

1. **Week 3**: How to empathize with your users using think-aloud
2. **Week 7**: How to use existing design patterns to improve UX
3. **Week 11**: How to improve the accessibility of your designs

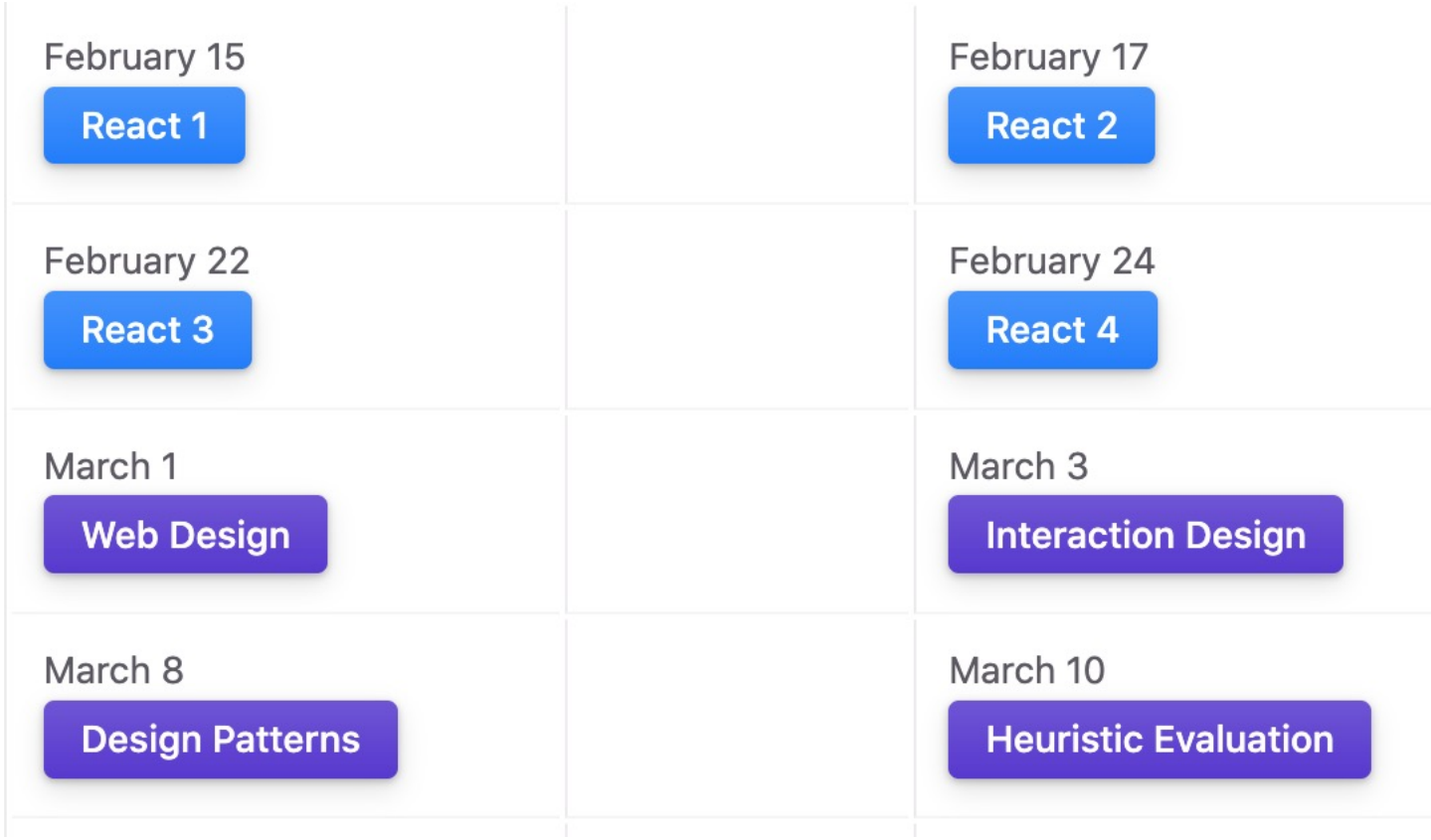
How they are put together

- Across three modules—web, mobile, voice—we will work on individual projects where you will incrementally and iteratively design and build user interfaces.

Image sources: left, center, right

The Anatomy of a Module

- Two weeks of building
- Two weeks of design
- Build assignment (Alpha) + Design assignment (Beta)



Course schedule

Participation

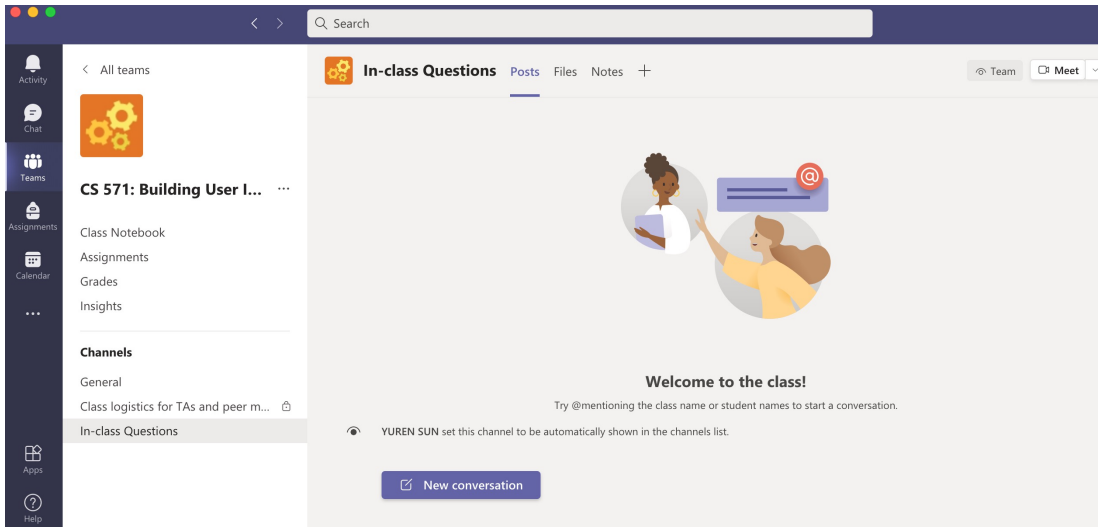
In-person class, TR 11:00-12:15 pm, Noland 168

Additional resources:

Online, async: through recorded lectures (posted by 9pm on day of lecture)

Communication

- Q&A in class: Live Q&A on Microsoft Teams
- Office hours: Microsoft Teams
- Assignment questions: Piazza
- Personal questions: email



Grading

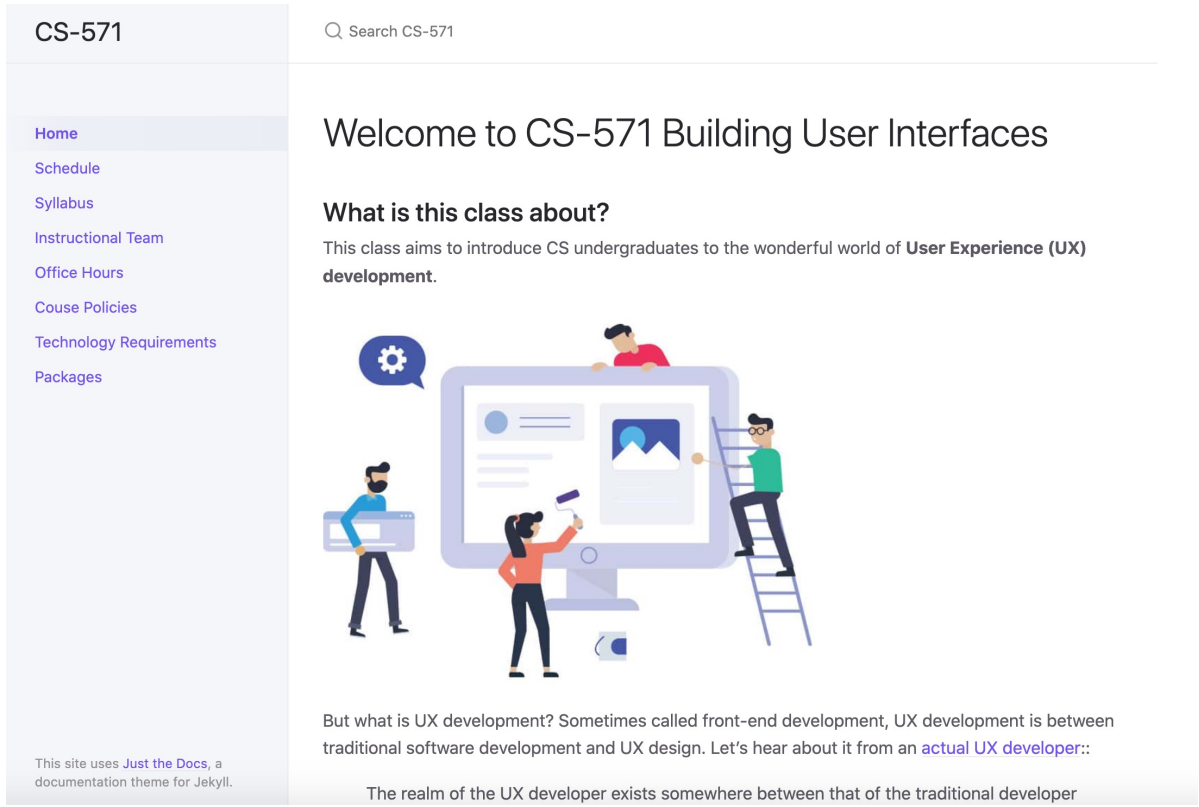
Assignment	**Points**
Weekly assignments	50
Midterm 1	20
Midterm 2	20
Quizzes	10
Total	**100**

Assessments

- Incremental module deliverables – α, β
- Midterms
  - Alternative exam dates for midterm
  - Contact TA to schedule alternative exam time for accommodation or other special cases
- In-class quizzes
  - Has to be completed within 24 hours after class

Systems we will use

- **Course website** for content (syllabus, lectures)
- **Canvas** to share/submit assignment
- **Microsoft Teams** for Live Q&A in class, office hours
  - Join Code: **i5v4dwf**. Click *Create and join teams* below your teams list and look for the *Join a team with a code card*.
- **Piazza** for Q&A
- **Canvas** for quizzes



Office hours

You will have a lot of help through discussion sessions and office hours

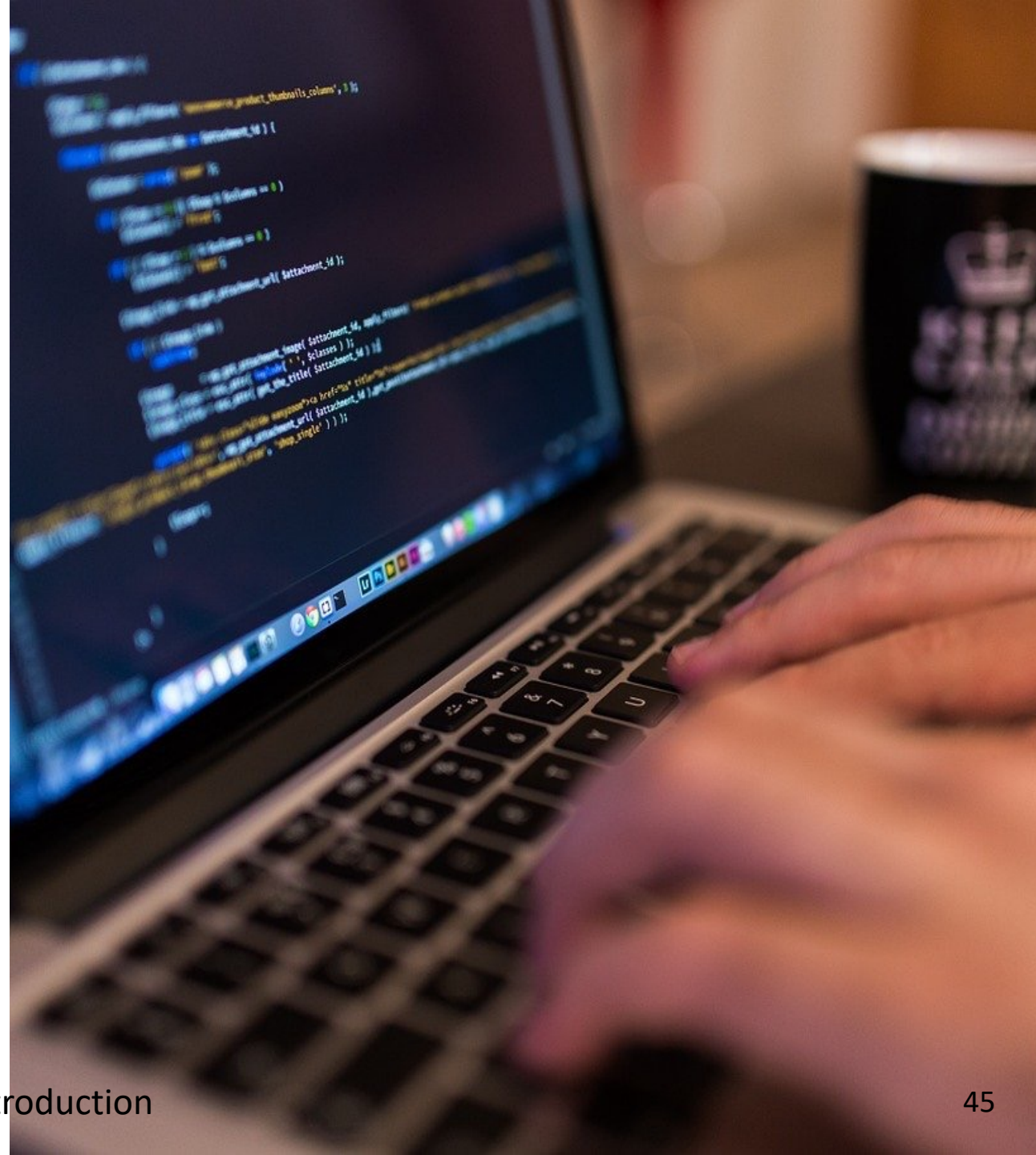


Image source

Discussion sessions

- Wednesday 5:00 – 7:00 pm
  - Ru or Ilkyu
- Thursday 5:00 – 7:00 pm
  - Brandon or Nick
- Each session can host around 20 students
  - Students can discuss with each other
  - TA or peer mentors will be there to answer questions
  - But, assignments need to be completed ***independently***

- Locations
  - CS 1263
  - Feb 23, Wednesday: Noland 553
  - Mar 30, Wednesday: Noland 553
- Discussion session will start from next week
- Registration form
  - Add you name, netID, and the questions you want to ask
  - 20 students per session
  - Form

Office hour links

- Monday
  - 1:30 – 3:00 pm Nick
- Tuesday
  - 4:00 – 5:00 pm Prof Zhao
  - 5:00 – 6:30 pm Ilkyu
- Wednesday
  - 10:30 am-12:00 pm Brandon
  - 5:00 – 7:00 pm Discussion session
- Thursday
  - 3:00 – 4:30 pm Ru
  - 5:00 – 7:00 pm Discussion session
- Friday
  - 9:00 – 10:30 am Ru
  - 10:30 am – 12:00 pm Nick
  - 2:30 – 4:00 pm Ilkyu
  - 4:00 – 5:30 pm Brandon

Policies

- **Grace days:** ***Four*** grace days that you can use to give yourself extra time without penalty. Individual assignments only (not including quizzes). After using up the grace days, late policy will be applied.

- **Late Policy:** Assignments submitted by 11:59 pm on the date of the deadline will receive full marks. For each assignment, 20% of the total grade for that assignment will be removed for each day that the assignment is late. Submissions that are 5+ days late will receive no marks.

- **Quizzes**: 5 quiz questions will be dropped when calculating final grade

Who to talk to about what?

- Grading questions → Brandon, Ru
- Assignment submission, technical questions → Ilkyu, Ru
- Programming or design questions → everyone!
- Personal questions; exceptions & emergencies, career, grad school, portfolio advice → Professor Zhao

Questions about Course Mechanics?

What's next?

- We'll hit the ground running this Thursday with the first build lecture: Javascript 1: An Introduction
- No class next Tuesday (Lunar new year!)

- Review the course website and meet technology requirements
- Brush up on some basics: HTML + CSS + Git/GitHub