Best Practices for Inclusive Teaching in Yale Computer Science

YALE UNIVERSITY

COMPUTER SCIENCE

Introduction

Statement of Purpose

The goal of this guide is to promote ways in which instructors can actively create spaces within their classrooms to amplify underrepresented voices and be a part of promoting diversity and inclusion in Computer Science moving forward. From language choice to course policies, the decisions that instructors make can have a large impact on student learning and success. This best practice guide serves as a starting point to build more inclusive classrooms by highlighting actionable changes instructors can make.

Genesis

In the spring of 2021, the Yale CS Climate & Diversity committee, chaired by Professor Theodore Kim, tasked a working group of volunteer Yale CS majors and faculty members to prepare this guide over the summer of 2021. This was in response to a growing demand to make our teaching more inclusive and the fact that many CS teaching staff are new to Yale, thanks to the recent growth in the Yale CS major and faculty. The members of this working group, Aderonke Adejare, Dana Angluin, Adriana Arcia, Timothy Barron, Maansi Dasari (Lead), Manahal Tabassum, Anna Zhang, and Lin Zhong, met biweekly over the summer and produced the first version, with input from fellow students and professors. The working group was cognizant that this guide will continue to evolve beyond its short tenure.

How to Read

This guide is broken into three major parts, with each part containing several sections. Many of these sections will reference other areas of the document, and these internal links will contain the referenced section number and a link to the section (ex: Section 1). The document also references several external resources, and clicking on these underlined portions will open the linked reference in a web browser.

Parts 1 and 2 of the document make specific recommendations for teaching practices and course policies, respectively. Part 3 includes a summary of policies specific to Yale that instructors should be aware of, and instructors who are new to Yale are advised to familiarize themselves with these policies first. The final section in Part 3 contains a glossary of Yale-specific terms that are used throughout the guide.

Part 1: Inclusive Teaching Guidance

Section 1: Accommodating Different Levels of Preparedness and Ways of Learning

Students enter courses with a wide range of backgrounds and prior exposure to the material. A large knowledge gap forms before students even get to Yale, resulting from variance in the quality of education, unequal access to extracurricular programs, and other situational factors. This gap is particularly large in the area of Computer Science, as coding curriculum has not been required or standardized in many areas. Students also differ in their ways of learning and engaging with the course. Instructors can embrace these various forms of diversity by taking measures to ensure that their course is as accessible as possible to all students who enroll.

Instructors are encouraged to consider the following ways of ensuring accessibility across different levels of preparedness and ways of learning:

Set clear and specific expectations about course prerequisites
Instructors can set clear expectations about prerequisites by listing specific concepts rather than only including course numbers. For example, instead of only noting "After MATH 222/225," consider adding more details, such as "Familiarity with matrix operations is assumed and matrices will be used frequently throughout the course." This is useful because topics of instruction for any given course can vary significantly between semesters and different instructors, and students may have forgotten certain concepts in the time after taking a certain course. While prerequisites are not formally enforced at Yale, the instructor should include all of the information in the course syllabus (see Section 8) and verbally bring attention to the course prerequisites during the add/drop period.

Get to know students and their backgrounds early on
It is recommended for instructors to survey, potentially anonymously, all students, in order to understand the overall class composition and variance. The survey may ask about whether students have taken certain related courses, what they are hoping to get out of the course, how much time they are willing to spend on the course, etc. The survey may also provide the opportunity for students to disclose any concerns that they anticipate coming up throughout the semester. With this information it becomes much easier to adapt a course to the students' backgrounds and interests.

Repeatedly assess where students are throughout the course
Instructors are encouraged to create low stakes opportunities for assessing class understanding and collecting feedback, in the form of weekly surveys or Canvas quizzes. These check-ins should be kept brief and serve to assess whether students are keeping up with basic concepts covered in lecture. Instructors may choose to give out grades for survey responses or participation in surveys, but they are not intended to be difficult assessments which require students to review material outside of class. Frequent assessments of the effectiveness of teaching will allow an instructor to adapt or review material that the

class as a whole may be struggling to grasp. They will also help instructors identify and work with individual students who may be falling behind conceptually (see Section 3).

Provide a variety of methods for students to engage with the course
Students can benefit from engaging with material in different ways, and instructors can try to diversify their teaching methods to engage more of their students. For example, when explaining a concept, instructors can both display a diagram to illustrate the concept visually and work through a practice problem to apply the concept. Some teaching methods to consider include lecturing with premade slides, writing on a board, live coding or working through example problems, showing visual diagrams or videos, and discussing problems in the context of their history or applications.

Instructors may also consider alternate teaching methods such as using a "flipped classroom" where students spend time outside of class learning the material and lecture time is spent on more active learning, such as working through problems together. See the Poorvu Center's page on flipped classrooms for more information and examples of flipped classrooms at Yale.

It is also recommended for instructors to provide different options for students to engage with the course so that students can benefit from the ones that fit their individual ways of learning. A few options include verbally participating in class, attending office hours, engaging with peers through an online discussion board, and completing low stakes quizzes/surveys.

Students have individual note taking preferences and it is recommended for instructors to be flexible with allowing as many methods as possible without allowing classroom disruption (ex: handwriting notes, taking electronic notes on a laptop or tablet, etc). If the instructor is lecturing using premade slides or lecture notes, students may also benefit from having access to the material before class.

Promote a growth mindset and avoid the expert blindspot
A student's mindset influences how they face and overcome challenges while learning. According to psychologist Carol Dweck, students may be broadly classified as having a "growth mindset" or a "fixed mindset" based on their behavior and attitudes about failure. In a growth mindset, students believe their classroom performance is a result of their effort and dedication, rather than based on their prior knowledge or 'natural' intelligence. This allows students to develop their resilience and creates a positive motivation for learning and risk taking to achieve growth, rather than focusing on avoiding failures. These skills are crucial to a student's long-term success, especially for students who enter a class with a lower level of preparedness.

Encouraging the following behaviors can promote a growth mindset:
- Asking a question even though it may be perceived as 'basic'
- Answering a question posed by the instructor even if unsure about correctness
- Seeking out challenges that push beyond the comfort zone
- Seeing failure as part of the learning process and finding value in the effort invested in the class, regardless of performance

Instructors can additionally avoid the "expert blind spot" which is present when instructors, who are expertly familiar with the subject they are teaching, misperceive the difficulties students will experience when engaging with the material as novices. Instructors may unconsciously neglect to explain foundational concepts, or underestimate the difficulty or time scale of an assignment. This can reinforce the idea that learning and success will require inaccessible expert knowledge. Being familiar with students' levels of preparedness and their progress throughout the course can help instructors resolve this issue.

Encourage collaborative work
Many students learn certain subjects more effectively through working with peers, either through group assignments or pair programming. Instructors can choose the size of groups, whether to allow students to form their own groups, and how to grade students based on the group result. Where possible, instructors are encouraged to incorporate individual contributions into student grades rather than automatically give all group members the same grade. See Section 6 for more guidance on general collaboration policies.

Students with less experience can benefit from collaborative work in the following ways:
- Shared responsibility for assignments makes the class seem more accessible to students who are not as confident in their abilities or do not have as much prior experience
- Working in a group allows struggling students to get help from stronger students in a low stakes environment without needing to take extra initiative

Collaborative learning has the following additional advantages for all students:
- Promotes planning solutions/considering tradeoffs ahead of time and writing clear code rather than coming up with a "hacky" solution
- Teaches students to be able to read code written by others and catch bugs made by their peers, which also reduces the burden on office hours
- Reinforces real-world soft skills such as planning, communication, accountability

Some challenges of collaborative work include the potential for unfair workload distribution, difficulty coordinating schedules, and conflicts between group members. However, all of these are common pitfalls of working in teams that students will have to handle in the future.

Section 2: Accommodating Students With Disabilities

When designing course materials and policies, instructors should build basic accessibility measures into their course from the beginning rather than considering students with disabilities as an afterthought. Instructors are required to honor accommodations for individual students from Student Accessibility Services, but should also embrace course-wide accessibility practices which benefit all students.

Definitions and Terminology
A disability is generally defined as a physical or mental condition that places limits on certain activities. Within this wide umbrella of disability, there are various types of disabilities that can present themselves in different ways, and individuals with disabilities are extremely varied in their experiences. Instructors should be aware that many disabilities are "invisible" or "hidden," meaning that it's difficult or impossible

for others to be aware of the disability but it is no less intense for the individual experiencing it. In addition, some students with disabilities experience sudden flare ups, so their needs may change throughout the semester.

In general it is recommended to use person-first language when referring to an individual with a disability (ex: "student with a disability" rather than "disabled student") but it is always best to consult an individual about their preference when referring to them (see Section 4 for more information about using inclusive language).

Yale Policies and Student Accessibility Services
Students with disabilities must register with Student Accessibility Services (SAS) in order to be eligible for academic accommodations. SAS is responsible for determining what types of accommodations are appropriate for each student, and students are required to present instructors with the SAS-provided "accommodation letter." Instructors are required to implement the accommodations listed in the letter, the most common of which include extended time on exams, note taking assistance, and permission to record lectures. Instructors can familiarize themselves with additional SAS policies and types of accommodations by visiting the faculty section on the SAS website or reading the detailed faculty guide which includes several recommendations for supporting students with specific disabilities.

Course-wide Practices for Accessibility
The following practices are recommended in order to best accommodate students with disabilities. A more extensive list of accessibility practices can be found in the Poorvu Center's Accessible Teaching section.
- Include a section in the course syllabus about welcoming and accommodating students with disabilities (see Section 8)
- Make course content as accessible as possible. The following suggestions not only help students with disabilities, but also lead to better-formatted materials that are easier to engage with for all students.
  - Documents uploaded to the course page should use accessible fonts and be compliant with the text-to-speech services provided by SAS. Instructors can use the ALLY tool in Canvas to verify accessibility of materials.
  - The course website and attached materials should use standard formatting such as list tags, headings, and accessible tables. Embedded images and URLs should also contain descriptive text.
  - All course materials should be available online, and instructors should avoid distributing any materials solely through paper handouts.
  - Material in text form (whether online or written to a board during lecture) should be displayed in a high-contrast color compared to the background.
  - Lecture content (ex: slides, notes) should be made available online, and instructors should enable closed captions when providing lecture recordings.
  - Microphones should be used in lecture halls when necessary, and speech should be organized and articulated as clearly as possible.
- Be understanding when students arrive to class late, as commuting between classes on time can be a challenge for students with disabilities, especially those who rely on the Special Services Van.

- End every lecture on time. Setting a timer for the end (or slightly before the end) of each class can help with this. This ensures that students are able to schedule rides or get a meal on time.
- Prepare ways for students to catch up on course material if they have to miss a class unexpectedly (due to sudden flare ups in their disability, medical appointments, etc). Be aware that there is currently no standard policy in place for students to receive a Dean's excuse for a missed class, so it is up to instructors to have some flexibility. If absences in a course are particularly concerning (ex: in the case of small seminars), instructors are recommended to communicate with the student's Residential College Dean (see Section 9).
- Be flexible with preparing alternate assignments or assessments for students who fall significantly behind. While SAS requires that the standards for course evaluation should not be reduced for students with disabilities, instructors may have some flexibility in modifying the types of assignment provided to make it easier for students to catch up, especially after lengthy absences. This can include conducting verbal assessments rather than assigning lengthy problem sets, grading only the portion of an assignment that a student was able to complete, or dropping certain problem sets in the most extreme case.

Section 3: Supporting Students Who Are Struggling

Even after taking broad measures to make a course as inclusive as possible, there will always be individual students who may struggle and need extra help throughout the course. It is recommended to have policies in place to identify and support these students, both at a course-wide and individual level.

Course-wide Practices
- Collect frequent feedback on overall and individual student progress throughout the course. Instructors may rely on a variety of methods to collect feedback, such as being mindful of patterns in student questions during class or on online discussions, communicating with ULAs regarding interactions at office hours, and directly surveying or assessing students through weekly check-ins.
- Remain flexible in teaching schedule and methods throughout the semester in order to incorporate continuous feedback. For example, when all students seem to be struggling with a concept or falling behind on a problem set, it would be beneficial to student learning to spend more class time reviewing the concept or providing a class-wide extension on the problem set.
- Build in flexibility for students in course policies, through measures such as free late days or the option to drop a certain number of assignments without penalty. This allows for students to make decisions for themselves based on their individual situations and reduces the need for frequent instructor involvement. See Section 5 for more information.
- Frequently advertise the resources available to students outside of the classroom, such as scheduled office hours, appointments, and private tutors available through the Poorvu Center's Small-Group and 1-1 Tutoring (up to 1 hour per week)
- See Section 1 for course-wide recommendations related to teaching practices

Working with Individual Students

Even when instructors offer free late days or provide other flexibility in the syllabus, individual students may require further extensions and support based on their situation. A student may require either one-time or recurring accommodations throughout the semester. It is in the instructor's power to work with the student and grant most of these requests (ex: extensions, dropping assignments or exams) without the need for a Dean's excuse. See Section 9 for more information on Dean's excuses.

It is recommended for instructors to frequently express willingness to support students, and even for instructors to include text in their syllabus to encourage students to come to them if they need any extra support (see Section 8). Instructors should also monitor student progress frequently through the methods suggested above and proactively reach out to students whose grades may be dropping or who may be falling behind conceptually. This can be done by emailing a student, or asking a student to meet after class or during office hours. These measures serve to demonstrate empathy and concern for students, and help students feel more supported throughout the course. If a student is unresponsive to instructor communication, the instructor should reach out to the student's Residential College Dean (see Section 9).

Section 4: Inclusive Language in Teaching

The Guidelines for Inclusive Language, published by the Linguistic Society of America, defines inclusive language as language that "acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities." In order to create a welcoming environment, it is important that instructors are cognizant of the language they use. Language can marginalize and discriminate against individuals on the basis of culture, race and ethnicity, gender, sexual orientation, disability, age, or socioeconomic status.

Principles for inclusive language in courses:
- Place people first: Instead of using an individual's characteristics as the leading term, use people-first language to emphasize the individual themselves. When not relevant to the discussion, avoid mentioning characteristics. For example, instead of "female engineer" use "woman on the engineering team" or better yet, "someone on the engineering team," if gender is irrelevant to the discussion.
- Avoid jargon and acronyms: The use of jargons and acronyms excludes individuals at different levels of knowledge. It is better to avoid them, but when they are used make sure to explain their meaning.
- Avoid phrases suggesting victimhood: In talking about disabilities, avoid phrases/euphemisms that suggest victimhood. This includes phrases like "afflicted by," "victim of," "suffers from," etc. For example, rather than saying that "the individual suffers from autism," use "the individual has autism."
- Be cognizant of the impact of mental disabilities: Do not use terms like "bipolar" or "OCD" as descriptors of everyday behaviors. Also avoid other derogatory terms that have a basis in the context of mental health like "crazy" or "psycho." The use of these terms has the effect of underplaying the impact of mental disabilities. Often there are more accurate and specific alternatives, for example, "detail-oriented'', "very unexpected", or "very extreme."

- Avoid gendered language: Do not presume that the normal is "male." For instance, using the term "guys" presumes that the normal, default human being is male. Instead, use terms like "folks" or "everyone."
- Ask when not sure: By asking individuals what their preferences are when you're not sure, you can incorporate people's choices into your language. An example is asking for students' preferred pronouns at the beginning of the semester. Rather than assuming an individual's gender, default to "they/them."
- Acknowledge diversity of backgrounds: Do not assume that everyone has had an equal experience or access to resources. For instance, avoid assuming the difficulty of an assignment when relaying it to students, e.g., "this should be very easy…"

A web search with the phrase "writing inclusive documentation" yields many resources discussing in detail how to make technical language in computer science more inclusive.

Part 2: Course Structure

Section 5: Course Policies for Late Work and Extensions

Instructors are advised to formulate and inform students of their course policies regarding late assignments and extensions of deadlines. These policies should be clearly stated in the course syllabus (see Section 8). Crucially, this is separate from extensions that may be authorized by the student's Residential College Dean (see Section 9).

General Considerations
- Fairness. Students should have equal access to the policies for which they qualify.
- Limitations. The instructor is **not** authorized to extend any course deadline past the end of the term -- only the student's Residential College Dean may do so (see Section 9).
- Interaction with the release of assignment solutions or private test cases. The instructor may specify that alternate assignments be done if an extension means that the assignment will be turned in after solutions or private test cases are released.
- Impact on office hours. As noted in Section 7, more students attend office hours ahead of deadlines. Students turning assignments in late are more likely to need extra help, so additional hours may be needed **following** initial deadlines.

Possible Policies and Additional Considerations
Some policies that have been used in Computer Science courses are described. It is wise to anticipate student requests for extensions beyond those available under any general policy.
- Late penalties. These generally are specified by a formula (possibly nonlinear) giving a score deduction as a function of the amount of time an assignment is late. Typical is a score penalty of 5% per day late, with a cutoff after a week. Anecdotally, students really don't like the prospect of

losing **any** points on an assignment, and generally treat the deadline as absolute, even if a day's lateness would reduce the score by only 5%.

- Late days. These are generally used in conjunction with late penalties to give students some flexibility in managing their deadlines. For example, students may be allocated five "late days" for the term, which they may use to delay their individual deadlines for assignments without penalty. The instructor may require the student to specify when they are using late days, or may calculate their use automatically. Other relevant considerations:
    - Students should be able to find out how many late days they have used at any point in the term.
    - Students will ask if they get "credit" for unused late days. This would reduce the perception that they are "free", and the recommended answer is no.
- Dropping assignments. Specifying from the start that the N lowest assignment scores will be dropped from the calculation of the final course score means that students who are pressed for time at a given point in the term may omit the current assignment without fear of impairing their course grade. Of course it is up to the student to learn the material covered by an omitted assignment. This may lead to the last N assignments being skipped by students who did well enough for an A throughout the course.

Section 6: Collaboration and Academic Honesty Policies

The course syllabus should include a collaboration and academic honesty policy that clarifies expectations for assignments. For more details about advantages and disadvantages of collaborative work, see Section 1. This section focuses more on the communication of the chosen policies. Three sample policies are provided below, each allowing different levels of collaboration for different types of classes. These samples are modeled on existing policies provided by CS faculty. Using consistent language throughout the department can reduce confusion from students, but instructors are welcome to tweak or build off of these as necessary. In particular, it may be valuable to add to or modify the beginning of the section to provide some motivation for the policy that is specific to the learning goals for the course. If the instructor employs different collaboration policies for different types of assignments (e.g. working in groups on projects, but not on psets), this should also be made clear in the syllabus and in each assignment.

It is recommended to discuss the policy in class to be sure students are aware of it. Clearly communicating what is forbidden, explaining that the teaching staff has tools to identify cheating, and describing potential consequences may reduce the number of unfortunate cases that need to be dealt with.

For more information about the Yale College Executive Committee and its procedures for handling violations of course procedure, read this entry in the undergraduate regulations. Questions about how to handle cases of academic dishonesty should be directed to the Computer Science Department Academic Honesty Committee.

Sample 1: Individual

The homework assignments in this course are intended to give you practice at working through problems independently. Therefore, unless otherwise specified, the homework assignments are your individual responsibility and are not group assignments. Plagiarism is a violation of University rules and will not be tolerated. You must neither copy work from others (at Yale or elsewhere) nor allow your own work to be copied. In addition to grade penalties, additional consequences for breaking this policy may be imposed by the Yale College Executive Committee.

You *may:*
- Ask others or search online for help with general issues with programming languages, APIs, IDEs, tools, and high-level course concepts that are not specific to the assignment.
- Ask clarifying questions about the requirements of an assignment to TAs or on the course discussion board.
- Discuss more specific issues on an assignment with a TA or instructor.

You *may not:*
- Discuss your individual solution with your peers.
- Receive a printed or electronic copy of anyone else's work for the course from this term or any other term. This includes asking or paying someone else to complete the assignment for you.
- Give anyone else a printed or electronic copy of your work for the course for this term or any other term. This includes posting your work publicly on sites such as Github.
- Seek out solutions to similar assignments online.

If you have any questions about this policy or are unsure if you may have crossed a line, discuss it with the instructor as soon as possible.

Sample 2: Limited collaboration

Your submissions for assignments in this course should be based on your own understanding of the problems. You should strive to solve these problems on your own, but sometimes even understanding the problems poses a challenge. You are welcome to discuss the problems with your classmates to achieve understanding of the problems and to consider small examples. After you understand the problems, you should try to solve them on your own. If you need help, you can discuss the problems with the course staff. You may also ask others to find mistakes in your attempted solutions, and you may help find mistakes in your classmates' solutions.

If you are truly stuck, you may discuss the problems with a few other students. If you do this, you must follow Stan Eisenstat's "Gilligan's Island Rule":
When discussing an assignment with other students, you may write on a board or a piece of paper, but you may not take any written or electronic record away from the discussion. Moreover, you must engage in a full hour of mind-numbing activity (e.g., watching back-to-back episodes of Gilligan's Island) before you work on the assignment again. The idea is that you should be able to reconstruct what you learned from the discussion, by yourself, using your own brain.

This no-record/"Gilligan's Island" rule applies to solutions found in online or other published sources as well. Under no circumstances may you directly examine a copy of another student's work nor may you provide a copy of your work to another student. You must write your solutions independently.

You must cite all references that you use and acknowledge any of your collaborators. However, you may use class notes and materials or consult course staff for more detailed help without attribution and doing so does not trigger the Gilligan's Island rule.

If you have any questions about this policy or are unsure if you may have crossed a line, discuss it with the instructor as soon as possible.

Open collaboration policies may be more general and may require more adjustments for specific courses. For example, the course may encourage discussion among classmates, but disallow online sources. Groups may also be broad and informal with each student submitting their own work while citing their collaborators, or a single submission could be made from each distinct group. In the latter case, it may be more appropriate to choose one of the policies above, but treat each group as a unit such that they may work together within the group, but not collaborate with other groups.

Based on the experience of others in the department, it is worth noting that open collaboration policies can have unintended consequences for URM students who may not benefit from the same network of peers in the class. Instructors are encouraged to collect relevant data throughout the semester that could help inform decisions about group work in the future. Assigning students to groups may be an option, but it comes with other drawbacks since the groups may not have compatible schedules or work personalities. Limiting groups to two students may be an appropriate compromise. Pairs are easier to form, leave students who choose to work alone at less of a disadvantage, and are more likely to lead to more even contribution (since it is clear if your partner is not pulling their weight).

Sample 3: Open collaboration

This course is intended to give you experience working in groups to solve problems collaboratively. While you may not directly copy work from prior semesters, you may freely collaborate with your peers in the class (*potentially in limited size groups)* or use resources you find online without applying the Gilligan's Island rule. If you do work with anyone, you should acknowledge your collaborators. Similarly, you must cite all references that you use other than the lecture notes for the course.

If you have any questions about this policy or are unsure if you may have crossed a line, discuss it with the instructor as soon as possible.

Section 7: Accessibility of the Teaching Team

This section provides suggestions for improving accessibility of instructors and teaching staff (TFs/ ULAs) through office hours (OH) and online discussion forums. Particularly for large classes, it is helpful to provide multiple avenues for students to get help, and providing a few different formats can better suit individual ways of learning or comfort levels.

Office Hours
When scheduling office hours the following factors should be considered:
- A fixed schedule of open/drop-in office hours is more approachable than requiring students to schedule appointments for help. Appointments are best if used to supplement normal hours for students who may need additional time or privacy.
- Generally, OH should avoid meal times or common class times. Many students prefer evenings (after dinner) and weekends since these are times when they tend to work on assignments.
  - Breakfast: 8 a.m. – 11 a.m.
  - Lunch: 11:30 a.m. – 1:30 p.m.
  - Dinner: 5 p.m. – 7:30 p.m.
- Consider polling students to determine preferred hours.
- If the class is being taught remotely, identify any students who are located in distant time zones and prioritize scheduling at least one slot that works for them since their schedules are more likely to be strained.

- While a consistent schedule will cause less confusion, make it clear that it may need to be adjusted during the semester depending on utilization and that student feedback can influence the schedule.

Formats:
- The traditional format of 1-on-1 meetings in the instructor's office is best for private discussion of individual circumstances such as extensions, issues with grades, letters of recommendation, or additional topics beyond the scope of the class. For small classes this may be sufficient, but it can be difficult to manage if there is a long queue of students waiting for help.
- Group meetings in a larger room can be more efficient for many students, particularly when they have questions about homework assignments. An effective technique is to cycle through students, giving each a few minutes and some suggestions, then leaving them to think/work on it until you come back around to them to see what progress they have made. This provides faster turnaround times for students with small issues and is more productive than waiting for a student to debug something live 1-on-1. Consider grouping students with similar questions together to save time and encourage collaboration, if allowed by the course collaboration policy (see Section 6). If group OH is the primary format, keep in mind that additional 1-on-1 appointments may be necessary for more private issues.
- Remote meeting tools were necessary during Covid-19, but may still have a place when teaching in-person. Some students have become used to the convenience of joining OH for a quick question without walking across campus, and screen sharing a programming assignment can be easier than trying to look at a small laptop screen together. Consider offering a mix of in-person and remote OH, or handling individual appointments remotely.
  Keep in mind that there are many different tools that can be used (Zoom, Google Meets, Teams, Slack, Discord, Skype) and the list will certainly change over time. Familiarity and ease of use are important for the accessibility of OH, and currently Zoom has the advantage that most faculty and students have become familiar with it through necessity. However, if the teaching team finds Zoom to be insufficient for large scale office hours, consider options that support the following useful features.
  - The means for students to check-in to a queue or leave a timestamped message
  - Screen sharing from multiple users simultaneously
  - Sharing of individual windows for improved privacy
  - A permissions system enabling teaching staff to move students in/out of calls/meetings without students being able to intrude on their peers
  - Usable in a web browser for improved security and lower barrier of entry

Managing long wait times:
- If necessary, limit the time per student (10-15 minutes depending on the size of the queue). Give actionable advice and suggest that they spend some time thinking and check back in if there is time after helping other students.
- Transition to a group format in a larger room if the queue is too long. Aside from advantages listed above, being in the room and seeing other students being helped can make the wait feel less tedious.

- If a student needs more time or more privacy, schedule a separate appointment or refer them to OH with another member of the teaching team.
- Schedule more TFs/ULAs at the same hours to handle bursts of attendance during busy times. While these times may not always be predictable, it is realistic to assume the most busy times will be on days just prior to deadlines.

Other tips:
- Keep track of OH attendance using a physical sign-in sheet or with a record of the digital queue. This helps to adjust OH schedules to fit demand, identify students who may be struggling, and may be used to factor into participation grades. This can also be used by teaching staff to keep track of who has been helped.
- To help students feel comfortable coming to office hours, keep in mind the guidance on inclusive language discussed in [Section 4](#).
- When more space is needed for OH, use [25Live](#) to reserve rooms.
- If teaching staff find that many general homework questions are repeated, consider directing common questions to an online Q&A forum, sending out an assignment FAQ and/or clarifications, or having ULAs host a group walkthrough to help students get started on difficult problems.

Online Discussion Forums
An online forum monitored by the teaching staff is a useful supplement to office hours. This section summarizes some of the advantages, followed by potential issues to be aware of, and a discussion of a few available tools.

Advantages:
- Instructors may want to encourage using the forum instead of email to cut down on overhead and repeated questions.
- Questions and answers are public so students benefit from their peers' questions even if they had not yet thought of it.
- While some questions may require an answer from the teaching staff, students can also provide answers, building a sense of community in the class and reducing the workload for staff.
- Students can get faster turnaround times on some questions compared to waiting for OH.
- Students with conflicts during scheduled OH will still have an avenue to get help.
- Students may ask questions anonymously. This encourages participation from students who are uncomfortable speaking up in class in front of their peers or those who are intimidated by in-person OH.

Caveats:
- Keeping up with questions is time consuming and students expect quick responses which may not always be possible. If an important question requires a long and thorough response, consider addressing it in the next lecture instead. Utilizing teaching staff to assist with answering questions is important, but may be difficult to organize. One option is to create a rotating schedule of staff

who are responsible for checking the forum at particular times. Some questions may require an instructor's feedback, but these can be passed along by a staff member when needed.

- As with any online forum, teaching staff need to be prepared to moderate discussion if necessary to remove inappropriate or abusive comments as well as those that break the academic honesty policy. The syllabus (or a pinned post) should include a statement on what is acceptable and unacceptable. Here is a sample message to use as a starting point.

  > Rather than using email, we encourage you to make use of this space to discuss the course with classmates and ask questions of the instructors. You may not post answers for any assignment, recitation or exam, in whole or in part. You may ask for assistance or provide assistance with homework problems (with respect to understanding what you are required to do), specific language syntax, compilation errors, program environments, topics discussed in class or in your textbook, and other course related matters. You are asked to treat each other with respect. Please do not post or respond with derogatory remarks, or these remarks will be removed at the instructor's discretion.

- While anonymity is an advantage for some students, the general tone of questions can be more negative when completely anonymous. This is configurable with Piazza and Ed Discussions so that students can be anonymous to their peers, but not to instructors. This is a reasonable compromise since it may lead to more constructive discussion and allows the instructor to identify and help students who are consistently struggling.
  If students need a place to anonymously vent about frustrations with the course, that is reasonable, but the Q&A forum is not the best place for it. The Mid-semester feedback tool in Canvas provides a way for students to submit anonymous course feedback in a structured way. It includes a few basic questions with an option for instructors to add more. Other tools such as anonymous Google forms can also be used to collect feedback on a more frequent basis. Encourage students to use these channels if they have issues with the class rather than broadcasting on an open discussion forum that is better used for helping each other understand course content.

Notes about specific tools:
- **Ed Discussions** is the current tool recommended by Yale. It integrates with Canvas to enroll students and supports single sign-on with Yale NetIDs. It provides most of the same features as Piazza as well as these useful features.
  - A record of all types of interaction (views, questions, answers, likes, etc.) can be exported for assessing participation.
  - A rich content editor including syntax highlighting for a variety of languages.
  - Follow-up discussions may be threaded to make it easier to see who is responding to whom.
- **Piazza** is a popular tool, but due to recent changes in their business model, Yale chose not to integrate it with Canvas as of 2021. While it is still possible to use it, it is not recommended, and students will not be able to sign in with their Yale NetIDs.

- **Canvas discussions** have the advantages that they are built directly into Canvas and posts can be graded which is convenient if grades are also tracked through Canvas. However, the interface is less intuitive for general Q&A and it lacks many useful features of the above tools, such as posting anonymously. Therefore, Ed Discussions remains the recommended tool at this time.

Section 8: Crafting a Syllabus

The syllabus is a critical document for communication between instructors and students. Beyond allowing students to understand the instructor's expectations and goals, a syllabus can also affect students' impression of the instructor and their teaching style, influencing how students later engage with the course. A course syllabus should invite students to engage with the course, explain course objectives, detail logistical information, state expectations, and be encouraging.

Outlined below are important sections to include in a course syllabus to help build an environment that values inclusivity and student well-being. For more extensive guidance on general syllabus development, the Poorvu Center provides recommendations for what sections to include, example language, and additional external resources.

What to Include
- **Teaching staff pronouns:** Along with name, title, and contact information, include all of the teaching staff's pronouns. This allows students to know how to refer to every member of the teaching staff and helps create an inclusive environment for students to feel comfortable sharing the pronouns they use.
- **Code of conduct:** Outline expectations for instructors and students to be respectful and inclusive in their language (see Section 4). Make clear that violations will not be tolerated, and provide a way to report violations to course staff.
  - For courses with a significant discussion component, it may be worthwhile to spend a few minutes on the first day of class co-creating this code of conduct with the students, allowing the group to form expectations for each other together.
- **Academic integrity statement:** Discuss plagiarism and collaboration and the forms of peer engagement that are encouraged (for recommendations, see Section 6).
- **Attendance and lateness policies:** Note penalties, and any flexibility, if any, for missed exams, late assignments, missed classes, and tardiness (for recommendations, see Section 5).
- **Diversity statement:** Show support toward marginalized communities and identities, reflect on the biases and exclusionary practices found in the history of the discipline, and discuss steps taken to make the class more inclusive.
  - Examples of diversity statements can be found on The Sheridan Center at Brown University's "Diversity & Inclusion Syllabus Statements" and the Poorvu Center's "Diversity Statements."
  - Guidance on making the class more inclusive can be found through the Poorvu Center's Diversity and Inclusion modules: "Awareness of Socioeconomic Diversity," "Awareness of Implicit Biases," "Inclusive Classroom Climate," "Inclusive Teaching Strategies," "Racial Awareness."

- **Accessibility statement:** Share your commitment to making the course welcoming to students of all abilities. Encourage students to reach out to you and Student Accessibility Services if they face accessibility challenges (see a sample from the Poorvu Center's "Include a syllabus statement").
- **Support for student well-being:** Encourage students to take care of themselves, prioritize mental wellness, and seek help when needed.
  - Examples of statements for student well-being can be found on Dartmouth University's "Syllabus Guide: Mental Health and Wellness" and California Polytechnic State University's "Syllabus Statements: Wellbeing Support."
- **Advice to students:** Suggest ways to succeed in this course (e.g. studying methods and time management recommendations), but acknowledge that everyone learns differently.

General Guidance
- **When and where the syllabus should be posted:** The Handbook for Instructors of Undergraduates in Yale College notes that "[a] syllabus, even if provisional, should be posted to Canvas @ Yale well in advance of the Course Selection Period" so that students can get a sense of what the course is like before the semester begins.
- **Include the date of the last revision on the syllabus:** It is helpful to include the date the syllabus was last revised for both the student and instructor's reference. If a syllabus is provisional, instructors should state this at the beginning of the syllabus so students understand that there will likely be changes made.
- **Minimize revisions to the syllabus:** Instructors should try to minimize the number of adjustments made to a syllabus during the course. While sometimes changes are necessary and unavoidable, the Poorvu Center for Teaching and Learning advises that instructors should not change "[d]ue dates of papers or timing of exams to the disadvantage of students," "[a]ssessment and evaluation structure if rendered more inequitable," or "[r]equired materials for the course which place new financial burdens on students or render their previous purchases obsolete" once students have finalized their schedules. Furthermore, if instructors make any changes to the syllabus, they should announce the updates to ensure that students are aware of these changes.
- **Use inclusive language:** Refer to Section 4 for guidance and learn about the importance of inclusive language from Harnish & Bridges' "Effect of syllabus tone: students' perceptions of instructor and course."
- **Ensure the accessibility of the syllabus on Canvas:** See Section 2 for more recommendations on overall course accessibility. The following are best practices for sharing a syllabus on Canvas, according to the "Top Accessibility Tips for Instructors" from the Poorvu Center:
  - Make the syllabus the home page on the course's Canvas page to make it easy for students to reach the syllabus.
  - Use Canvas' editor to create a syllabus instead of PDF or Word document formats as the rich content editor (RCE)/HTML generally makes the syllabus more usable and accessible than other formats.
  - Use headers in the rich content editor tools to organize the page and provide page structure so that individuals who use a screen reader can more easily navigate the page.

- o [Link assignments, readings, and other files](#) referenced by the syllabus in the syllabus itself to make it easier for them to navigate course materials.
    - o If the syllabus is in PDF format, as opposed to the recommended Canvas-editor created syllabus, scan the PDF through [ALLY](#) to make sure it is accessible.
- **Evaluate your syllabus:** Use the [Inclusion By Design: Survey Your Syllabus and Course Design worksheet](#) to assess the course's syllabus and make improvements accordingly.

Part 3: Yale Specific Policies

Section 9: Residential College Deans, Dean's Excuses, TIs, and ABXs

When an instructor wishes to discuss a student's academic situation, the student's Residential College Dean (RCD) is almost always the best person to contact. Every Yale College undergraduate is assigned to a residential college (which is listed in the course roster), and each of the fourteen residential colleges has a Residential College Dean who lives with their family in the College and oversees the academic welfare and progress of all of the students in their College. The [Residential College Deans' Directory | Yale College](#) gives their contact information.

Midterm and Other Feedback

Foremost: If an instructor has concerns about a student's well-being or performance in their course, the instructor is advised to proactively email or call the student's RCD about those concerns. The RCD has an overall view of the student's academic situation, and will talk to the student to help them find resources to cope with challenges they may be facing. Conversely, the RCD of a student may reach out to instructors of the student's classes if the RCD has concerns that the student is experiencing academic difficulties.

The instructor is required to give all the undergraduates in a course feedback on their performance in the course, preferably in written form by the end of week seven ([Midterm Feedback in Courses < Yale University](#).) This requirement can be met by returning one or more graded midterm exams or a sufficient quantity of other graded assignments to the students. Because students may drop a course by the Yale College Midterm deadline without having it appear on the transcript, some students will ask for an assessment of their "probable grade" before that date.

Instructors are also requested to give notice to the RCD of any student in danger of receiving a D or F in the course, by filling out a form available from the University Registrar ([Midterm Reports on Students Doing Unsatisfactory Work < Yale University](#)). The RCD will work with the student to address the issues, and the student may be referred to Yale's tutoring program ([Tutoring Resources < Yale University](#)).

Extensions Authorized by RCDs

Another kind of communication between RCDs and instructors concerns late work in a course: a Dean's Excuse (which postpones a course deadline during the term), a Temporary Incomplete (TI) (which postpones a course deadline past the end of term), or a postponement of the final exam in a course (ABX).

The policies governing deadline extensions may be summarized as follows: for work during the term, a student's RCD may give a Dean's Excuse for a **very narrow** range of reasons, and any other extensions are

at the **discretion of instructors**. However, extensions past the last day of final exams and postponements of final exams **cannot** be authorized by instructors, and can **only** be authorized by the student's Residential College Dean.

Dean's Excuse. There are a very limited number of situations in which a RCD may issue a Dean's Excuse for a student, and the instructor is expected to honor the postponement authorized by the RCD. Summarizing, these situations are an incapacitating illness or condition, the death of a family member, the requirements of religious observance, or the requirements of participation in an intercollegiate varsity athletic event. (Work Missed during the Term)

Asking a student to seek a Dean's Excuse in a non-qualifying situation leads to a frustrating and ultimately fruitless task for the student. Because of the very limited circumstances in which a Dean's Excuse may be authorized, the instructor is strongly advised to choose and communicate a course policy on late work and extensions (see Section 5).

Temporary Incomplete (TI). The instructor is **not** authorized to extend **any** course deadline past the end of term -- only the student's RCD may do so, and may do so only in a limited number of situations. Summarizing, these situations are: an incapacitating illness or condition, a serious family emergency, or a matter of comparable moment. The TI extension may be for up to a month. If the student's RCD authorizes a TI, the instructor is expected to facilitate the submission and grading of the late work. If the instructor mistakenly extends a deadline past the end of term without a TI authorized by the RCD, the student's work **cannot** be counted in determining their grade in the course. (Work Incomplete at the End of Term < Yale University)

Postponement of the final examination in a course (ABX). The RCD may, in a limited number of situations, authorize the postponement of a student's final exam in a course. Summarizing, these situations are an incapacitating illness or condition, a family emergency requiring absence from New Haven, the requirements of religious observance, the requirements of participation in an intercollegiate varsity athletic event, or in certain cases when the student's final exams would be too close in time. An instructor **may not** authorize the postponement of a student's final exam. If the RCD authorizes the postponement of a final exam for a student, the instructor is expected to supply and grade a make-up exam at the appropriate time. (Postponement of Final Examinations < Yale University)

Student Concerns about Residential College Deans or Others
An instructor may learn that an undergraduate has concerns about discrimination or other inappropriate behavior from their RCD or other members of the Yale community. The instructor can suggest that the student contact one of the Discrimination and Harassment Coordinators, or someone at the Office of Institutional Equity and Accessibility. Overall information is available at Resources to Address Discrimination and Harassment Concerns: Welcome. The description (for students) of Discrimination and Harassment Resource Coordinators:

"When you have concerns or questions, you have a range of choices for support. Discrimination and Harassment Resource Coordinators (formerly "Deans' Designees") have been identified by the Dean of each college and school as community members with the responsibility to receive concerns and offer advice and guidance related to diversity and inclusion, discrimination and harassment, retaliation, and equal opportunity. Discrimination and Harassment Resource Coordinators may also help facilitate informal resolution. This may be an individual's best "first stop" in discussing a concern related to discrimination, harassment, or retaliation, particularly as Discrimination and Harassment Resource Coordinators will be knowledgeable about resources specific to their school or college."

Section 10: Policies around TFs, ULAs, Tutors, and Graders

Yale has four categories of teaching assistants and many of the details will differ from other institutions. See [this table](#) for a detailed comparison of each, but this section summarizes a few key points about TFs and ULAs since they are the most commonly used in the CS department. Hiring of teaching staff is first-come-first-served and goes through the department registrar, Sabrina Whiteman, who can also address questions about allocation which varies depending on the course.

Teaching fellows (TFs) are graduate students and are the most flexible in terms of the roles they may take.

- The typical expectation is that a TF will work 10 hours a week for the course.
- In terms of allocation of staff for each course, hours worked by TFs and ULAs are weighted equally. Therefore a course that is allowed three hires might have one TF and two ULAs or two TFs and one ULA.
- When assisting in a graduate course they are grading their peers and are expected to follow similar guidelines to ULAs for grading, that is, they are not permitted to perform any kind of qualitative assessment.
- When hiring TFs it is useful to know that CS PhD students are required to be a TF for at least two semesters and priority is given to 2nd year students who need to fulfill this requirement. International graduate students must also pass an English proficiency exam before they can be hired as a TF (although they may be hired as grader without this requirement).
- For more details about teaching fellows, see [this page from the GSAS](#).

Undergraduate Learning Assistants (ULAs):

- While TFs may be more experienced in general, ULAs can be particularly helpful for office hours and grading when they have recently taken the class themselves.
- ULAs are expected to work 7.5 to 10 hours per week. Unlike TFs, they are paid hourly and report their timesheets weekly. It is important that the primary instructor reviews and approves these timesheets in a timely manner so that ULAs continue to be paid for their efforts.
- ULAs may not "grade essays or perform any type of qualitative assessment." They may still assist in grading when there is a clear rubric or answer key to follow. They may also assist in developing and running autograders.
- Grading should be "blind" meaning that students' names should be hidden during grading. While this may be difficult for handwritten assignments, submissions to online tools such as Canvas and Gradescope can enable blind grading.
- May work during the Reading Period, but they cannot be forced to, and this should be discussed with the ULAs when they are hired. After this point, ULAs are typically not paid and therefore should not be relied upon to grade final exams. If this would cause an issue, consult the Director of Undergraduate Studies to discuss other options.
- Refer to [this section of the Handbook for Instructors of Undergraduates](#) as well as [this site](#) for more details about ULAs.

Graders may be undergraduate or graduate students, but it does not fulfill the teaching requirement for graduate students.

Section 11: Yale Handbook Policies

Yale provides a [Handbook for Instructors of Undergraduates in Yale College](). It is a thorough document and a useful reference for Yale policies. Rather than summarizing the entire handbook, the following highlights a few notable policies that may be different or unfamiliar to those new to Yale. The relevant sections are linked for more details.

- Students have a long time to decide if they wish to [withdraw from a course]().
    - Students may withdraw as late as the last day of classes.
    - The course does not appear on a transcript if dropped by Midterm. This may lead to a surprising drop in the class if students are not happy with their anticipated grades at that point.
    - Instructors should provide [sufficient feedback by Midterm]() for students to measure their standing in the course.
    - [Credit/D/Fail]() can also be selected by the last day of classes.
- In addition to getting help from teaching staff, the Poorvu center provides [tutoring resources]() to struggling students. The student needs to fill out a form and get it signed by the instructor saying that they are at risk of receiving a course grade of C or lower based on graded exercises, class participation, or individual discussion with the student. Not all students are aware of this so it is worth pointing students in this direction if the teaching staff are stretched thin.
- Undergraduates may [audit courses](), but this is not recorded on their transcripts. Graduate student auditors are recorded on transcripts and they are generally [expected to attend two thirds of class meetings]().
- [Course requirement policies]():
    - No assignment/exam should account for more than 50% of the final grade.
    - Participation should account for no more than 20% of the final grade.
    - No more than 20-25 pages of formal academic writing may be required per term.
- [Instructors must include the price and ISBN of text books in the course syllabus.]()
- Reading period takes place between the last week of classes and the beginning of the final exam period. Aside from studying for exams and working on term papers/projects, other course work should be [finished before reading period]().
- Final exams/course projects
    - Formal final exams are given during a scheduled time slot assigned by the registrar. [If it is a take-home then it is due on the day of the scheduled slot.]()
    - A course does not have to have a formal final exam if an [exam is given in the last week of classes]() or there is a comparable project/report/presentation. These types of projects may be "due at the latest by the last day of the final examination period," but this has a few drawbacks. It would require students to work on it while studying for and taking other exams, it limits available time for grading, and it would be atypical among CS courses.

- If a course does not have a formal final exam, this information should be given to the department registrar so that it is reflected in the Yale Course Search.

Section 12: Other Recommended Resources

The latest [Handbook for Instructors of Undergraduates in Yale College](#) contains a wealth of guidance beyond the items mentioned in [Section 11](#) and should be used as a reference throughout the semester.

[The Poorvu Center](#) at Yale has many resources for improving teaching, some of which have been linked to from this document. They also provide more active assistance through [consultations or observations](#).

["Your First Year Teaching Computer Science" by Chris Gregg](#). Written by a lecturer in the Stanford CS department, this book is geared towards new teachers. However, it may also contain useful advice for more experienced faculty particularly in "Part III: Improving Your Craft."

Section 13: Glossary of Terms Specific to Yale

Terms related to the academic calendar, [Yale College Calendar with Pertinent Deadlines < Yale University](#):

Shopping period. Officially the "Add/Drop Period", this is the period from the start of classes until undergraduate schedules must be finalized, currently 14 days. Students "shop" (that is, attend on a trial basis) courses and make final selections about which they will enroll in. Instructors may find that the "shopping" attendance is considerably larger than the final enrollment in their courses.

Midterm. This is a particular deadline in the Yale College calendar, coming about eight weeks after the start of term. If a full-term course is dropped before Midterm, it does not appear on the student's transcript, but if it is dropped later, it appears on the transcript with a mark of W. Students may want to know their in-progress course grades in advance of this deadline to decide whether to drop.

Reading period. This is the period between the last day of classes and the start of the final examination period. Instructors should be cognizant of restrictions regarding reading period.

Final examination period. This is the period during which final examinations are scheduled.

Other terms:

The Credit/D/Fail Option. [The Credit/D/Fail Option < Yale University](#) allows undergraduates to elect to receive the grades of Credit, D, or F in up to six courses during their undergraduate program. There are many restrictions on this option. If a student has elected this option in a course, the instructor assigns course grades according to the usual scale (A-F), but the University Registrar converts grades of C- or above to Credit (CR on the transcript.)

Yale College Executive Committee (ExComm). The [Executive Committee](#) is charged with enforcing the Undergraduate Regulations, including offenses of academic dishonesty. Possible penalties range from reprimand to expulsion.

Director of Undergraduate Studies (DUS). The DUS is a primary administrative point of contact between undergraduates and the Computer Science Department, and has many responsibilities regarding the undergraduate curriculum and undergraduate academic advising. The DUS is assisted by the Computer Science Registrar.

Teaching Fellow (TF). Graduate students who are assigned to assist with the teaching of courses are called Teaching Fellows. Yale does not have an official "Teaching Assistant" (TA) title.

Undergraduate Learning Assistant (ULA). Undergraduates who are hired to assist with the teaching of courses are called Undergraduate Learning Assistants. The hiring of ULAs is coordinated at the department level.

Course grader. Undergraduate and graduate students may be hired as course graders, who are not expected to have direct contact with the students in the course they are grading.

Canvas. The course management system used at Yale. It is used to view enrolled students, post the syllabus and other materials such as lecture notes or assignments, to manage grades, and more. Note that final grades are not handled through Canvas, but rather submitted through the Faculty Grade Submission (FGS) site. The Poorvu center provides support for any issues with Canvas.