

CS 166 TA Manual

The CS166 HTAs

December 20, 2020

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1 Introduction

If you’re reading this document, you were probably hired as a teaching assistant for CS166—welcome! This document outlines the role and responsibilities of Undergraduate Teaching Assistants (UTAs) for the course. Credits are listed in Appendix B.

CS166’s goal is to introduce students to the theory and practice behind computer systems security. Ultimately, as a TA, you’re tasked with helping students learn about several “big ideas” in the realm of computer security and help them to develop a “security mindset” that will help them to critically and adversarially analyze the software and systems they approach in their CS careers.

1.1 Your impact as a TA

As a UTA, you will have the most direct interaction with students. Your attitude and the way you interact with students can have a huge impact on students’ view of computer security, the security community, and computer science in general.

Since many of the homeworks, projects, and lectures in this course have been written by TAs, it is safe to say that students spend a significant amount of time wrestling with TA-created content, perhaps even more time than instructor-created content. Additionally, some students spend more time working with TAs at office hours than they do in lecture every week—as a result, UTAs have a major impact not just on the course content, but also on the learning experiences of students taking the course.

1.2 Rewards for TAs

CS166 is a very personally rewarding class to TA—many TAs note that they come out of their TA experiences with a much deeper understanding of computer systems security than when they took the course. However, we’ve observed that the greatest benefits go to the TAs who engage with the course the whole way through, whether it’s writing new and thought-provoking questions for the homeworks or diving into project design and implementation

details.

1.3 Knowing your audience

There are several groups of people who take CS166. Students from almost every point in their CS journey take this course, and therefore you should expect CS166 students to have a wide range of backgrounds.

There are several broad groups of people who take CS166.

- Second-year and third-year CS concentrators. They generally take the course because they're interested in security, interested in learning more about security, or are looking to use the course to start or finish the Security track in the concentration. This course is aimed at these students in particular.
- Fourth-year students also take the course for those reasons, but some also need CS166 to graduate (and graduate). Some students also need to take (and pass) CS162 to capstone; otherwise, they can't graduate.
- Graduate CS students at Brown, who are interested in learning more about security or need the course for 2000-level credit (similar to taking the course for a capstone). It's also worth noting that graduate students have higher grade requirements in comparison to undergraduates—they must receive a B or higher to pass a course.

2 TA Responsibilities

2.1 Keeping up with course material (1 hour)

You should make sure you're caught up with the material as the course progresses. It's not critical for UTAs to know the exact details of encryption algorithms or network protocols, but you should be familiar enough with the course to be able to answer questions about recent material or point the student to a lecture slide deck, handout, or textbook section.

You are *not required* to attend lecture, but you should try to read the lecture slides, especially those related to the homework questions. (TAs working for pay are welcome to log additional hours if they watch lecture live or via lecture capture.)

2.2 Office hours (2 hours)

You should hold one block of office hours every week, depending on your role. Office hours are held in the CIT or via Zoom and are managed using SignMeUp.

Before office hours, you should prepare by reading the current homework and project handouts thoroughly, as well as any associated solution writeups or implementation code. (UTAs in past years report spending anywhere between 30 minutes to 2 hours preparing for their

hours. This varies from week-to-week and from person-to-person, so use your best judgement and whatever strategy works best for you.)

Our policy is that the hours queue always ends at the specified time and any remaining students should be instructed to return to hours the following day or ask their questions on Piazza. This is out of fairness to all students and to your co-TAs, who students may perceive negatively if others are consistently holding hours past their assigned blocks of time. However, you may use your discretion and goodwill in special cases such as around deadlines, etc.

2.2.1 Hours debrief

Immediately after each office hours session, you should send all of the TAs an “hours debrief” in the #ta-hours Slack channel with the following information:

- Time / day that you held TA hours
- How many people signed up for your TA hours? (How many students were not seen?)
- What was discussed? (Common questions? Is there anything in particular that people are finding difficult? Any issues that other TAs should look out for?)

Also, if you think there are errors in course materials, please report them as soon as possible on Slack. Even if you are not sure whether it’s actually an error, it’s best to make sure the staff is aware of any potential issues so we can resolve them quickly if necessary.

2.3 Piazza (1 - 2 hours)

Each TA is assigned the “Piazza TA” responsibility one day of the week. (Some days, particularly deadline days, will have two TAs assigned to that day.) Concretely, this means that you should regularly check Piazza on your assigned day and answer all student questions posted that day (with exceptions for questions that are posted late in the night). At a minimum, you should check at least three times on your assigned day (morning, afternoon, evening).

If you don’t know the answer to a Piazza question and you’re the “Piazza TA”, you should ask in Slack and the other TAs will help you formulate an answer. You should do your best to not allow questions to go *unhandled* to the next day, as this has caused questions to pile up on the TAs who are assigned to deadline days. “Handling” a question specifically means either (1) answering it or (2) asking about it in Slack.

Regardless of when a question has initially been “handled”, all Piazza questions should get a response within 24 hours.

This usually does not happen, but if a deluge of Piazza questions comes in on your day, feel free to ask for backup from the other TAs.

2.3.1 Emails

We generally don't get emails from students, but if a course-material-related question is sent to the TA listserv (`cs1660tas`) by a student, you should refer them to Piazza instead.

If a student sends a message to your individual email (and it's not a follow-up that you agreed to during office hours), you should refer them to Piazza with the TA listserv CCed.

2.3.2 Answering questions outside of office hours

With the exception of Piazza questions or emails from students, you should *not* answer questions outside of your office hours. This policy is in place out of fairness to all students, your co-TAs, and yourself. If one TA helps students outside of hours or Piazza, it seems like the other TAs are working less, even if they're doing their assigned work; if you personally help your friend once, they will start expecting you to do that for the rest of the semester.

If a student approaches you outside of hours with course-related questions, you should refer them to office hours or Piazza.

2.4 Grading (2 - 5 hours)

Every TA will do a roughly equal share of the grading. Your objective should be to grade in a way that is fair, consistent, and informative to the student.

Grading rubrics for each assignment will be provided by the HTAs. When you get the rubric, you should look it over and make sure that it makes sense to you. You should also feel free to raise any concerns about ambiguities or the like, since catching those kinds of issues early on can save a lot of time in the grading process.

On most assignments, we will grade via Gradescope. In general, our policy is that all point-related additions or deductions should be reflected in the rubric somewhere (that is, instead of making point changes via the "Submission-Specific Adjustment" box). This helps us ensure we're applying the rubric consistently across handins and allows us to easily make class-wide point adjustments when needed. However, every now and then an edge case will appear that warrants further discussion or expansion to the rubric. In this case, you should still avoid using the "Submission-Specific Adjustment" box on Gradescope and instead consult with the HTAs to add a new rubric item.

When a handin does not get full points on a component, you should generally write a brief and clear comment in the comment box explaining what you are taking off points for. (In some cases, the rubric item text will be specific enough that you don't need to write a comment—but use your discretion.) Many regrade requests are launched as a result of unclear grading comments and being clear and fair in your grading will reduce regrade requests and improve the student experience.

2.4.1 Homeworks

We do our best to grade all homework handins in a single grading meeting following the handin deadline—though this strategy may be modified for Spring 2021 given the remote work environment. Grading usually lasts 3–4 hours depending on the number of handins and the depth of the questions.

2.4.2 Projects

Projects are graded on a somewhat ad-hoc basis, but generally occurs in one of two ways:

- **Grading meetings.** As of Spring 2021, this applies to Cryptography, Flag, and Drop-box. We generally grade the components for each project like a homework, in a single grading meeting.
- **Interactive gradings.** As of Spring 2021, this applies to Handin. TAs meet with students one-on-one and evaluate their work in a live, interactive setting.¹

2.4.3 Midterms

There will be two midterm grading sessions: one for Midterm 1 and one for Midterm 2. These grading sessions generally run approximately the same length as the homework grading sessions.

Most TAs will be asked to preflight some midterm questions prior to their release date. More details on preflighting will be released as the midterms approach.

2.4.4 Regrade requests

In most cases, TAs are responsible for their own regrade requests. The exception to this rule is when we're anonymously grading on Gradescope and upon receiving a regrade request you realize that the student you graded is on your blocklist. In this case, you should refer the regrade to either another TA who graded that same problem or to a Head TA.

You should not give back points unless you have made a clear error in applying the given rubrics. If there is a dispute about the efficacy or the correctness of a rubric item, consult with the Head TAs as changing the rubric post-grading might require a course-wide grading change.

All regrade requests should be responded to within 72 hours. If you're having trouble resolving a regrade request, you can escalate the issue to the Head TAs. TAs should not

¹*Why do we hold interactive gradings?* Interactive gradings have their pros and cons. On one hand, they're a little more challenging for the TA staff since we have to coordinate logistics for the live grading sessions. On the other hand, grading is faster and easier when the student can show you their handin (in other words, TAs do not have to make sense of unclear handins), students generally do better when we do interactive gradings (because they can clarify things that come across as unclear in their README), and students get practice with verbally presenting security topics to others (which is a generally useful professional skill to have). Thus, we try to include at least one interactive grading throughout the semester.

meet synchronously with students to discuss regrades (for example, at TA hours or in an ad-hoc meeting), since it helps us handle regrades consistently across the course.

2.5 Staff meetings (1 hour)

The course staff meets as a group every week for an hour. The main task is to discuss the course material and assignments for the upcoming week, but we'll also discuss staff-internal and course-general logistics as needed.

TAs who are responsible for a given assignment in the course (specifically, projects if you've been assigned to "take point" on a project and homeworks if you're a Homework TA) are responsible for presenting a staff primer on the assignment at the staff meeting prior to the assignment's release date. The HTAs will release a schedule of meetings (as well as which assignments should be presented at those meetings) via Google Calendar so you can plan ahead for when you're scheduled to present.

2.6 Give demos (flexible hours)

Demos are a great way to learn more about a topic that you're interested in and also help us create an engaging student experience in lecture.

If you're TAing for credit and for a grade, we require you to do at least one demo throughout the semester unless you have an academic conflict (i.e., another class in the same timeslot) or other timezone constraints. TAs working for pay are not required to demo, but are very much encouraged to (students routinely say that the TA-led demos are one of the best parts of the course) and may log the hours spent preparing for pay.

If you're giving a demo, you should schedule a quick rehearsal session with the professor and the HTAs prior to the lecture that you're giving the demo at.

2.7 Take point on a project (some TAs)

Some TAs (every TA except the *Homework TAs*) will be assigned to "take point" on one of the course projects. Most projects will have 2 TAs assigned to it, though Cryptography will have 1 TA only.

If you are the "point person" on a project, you (along with whoever else is assigned to the project) is responsible for the following:

- Proofreading the handout
- Testing that the project still works (going through some exploits, etc.)
- Expanding on or updating staff solution guides (if needed)
- Presenting overview and solutions at staff meetings

The HTAs will check in with your group as the release date approaches, but it's ultimately up to you on how you want to split up the responsibilities between you and your co-project TA.

3 Roles and specializations

Every TA will be assigned a role throughout the semester. Note that, in addition to the responsibilities detailed below, *Lecture TAs* and *Clinic TAs* are assigned to take point on one course project throughout the semester (see Section 2.7); the other roles do not take point on projects since they are already responsible for presenting other content in staff meetings.

3.1 Lecture TA (3 TAs)

The Lecture TAs are responsible for working with the professor to review and write new lecture slides, and, in some rare cases, creating new lectures altogether. This job is great for someone who's interested in learning about and diving into new material (since the lecture slides are updated every year) and is interested in developing materials for previously-unseen topics in the course.

You are not required to attend lecture.

3.1.1 Timeline

- Approximately two weeks before your assigned lecture, you should email the instructor asking for a copy of drafts of the materials for your assigned lecture.
- The instructor will email you the lecture materials as well as comments explaining any particular slides they want you to modify, update, or replace.
- You should update the slides and respond with any of your own comments, which should include:
 - Pointing out typos in slides
 - Anything that isn't clear in the slides
 - Checking if there are clicker questions and if any need to be added (or if the existing ones make sense)
 - Suggestions for updating slides that were not mentioned by the instructor; for example, to make things more relevant to the assignments that year or to remove outdated content
- The slides should be finalized approximately three days prior to the lecture, with lecture slides being posted to the course website the night before the planned lecture date.

3.2 Homework TA (2 TAs)

The Homework TAs are responsible for beta-testing the problems that appear on the homework as well as developing and maintaining solutions to those problems. This job is great for someone who likes writing technical content as solutions, who's interested in engaging directly with the content that students work on in the course, and is interested in learning about a lot of interesting technical attacks and defenses (since that is the focus of the majority of the homework content).

3.2.1 Timeline

- Approximately two to three weeks before the release date of each homework, the Head TAs will send you a draft of the upcoming homework. You should then complete the following within a week and a half:
 - Complete the homework without looking at the solutions, writing up a complete solution set. You may do so independently or in conjunction with the other Homework TAs.
 - Send your (individual or joint) solution set to the Head TAs, along with a list of comments in the form:
 - * Problem 1a: Good
 - * Problem 1b: Good. There is a typo on line 2: “error” should be “errors”
 - * Problem 1c: Challenging—took me longer than 1.5 hours to solve
 - * Problem 1d: Required me to look up X ; is that expected?
 - You should reach out as soon as possible the problem statement is ambiguous, or might have multiple interpretations, or otherwise might be annoying to grade—we'll try to clear up those concerns as soon as possible.
 - You should also point out if the problem statement requires you to look up things (i.e. things that weren't covered in lecture). In many cases, this will be on purpose, but we should try our best to be upfront with students when they'll have to do their own research, so it's worth keeping tabs on this.
- At the staff meeting prior to the homework release, you'll present the solutions to the rest of the staff.

3.2.2 Notes

- All of your solutions should be at the same level of detail as a solution that you would submit if you were taking CS166 as a student.
- Each homework should take approximately 2–4 hours for a TA to complete (and about 6–8 hours for a student unfamiliar with the material to complete).

3.3 Clinic TAs (2 TAs)

The Clinic TAs are responsible for holding additional “Homework Clinics” for each homework in the semester. They hold two one-hour clinics every week (these are in addition to their normally scheduled office hours slot). This job is great for someone who loves working directly with students, particularly in group settings, and wants more student-facing interaction than the default office hours requirement.

In general, we prefer to hold the Homework Clinics as one-hour sessions rather than two-hour sessions, since the two-hour sessions historically have resulted in students just sitting silently in the room for two hours and listening to solutions without collaborating with others.

3.4 STAs (2 TAs)

The STAs (or Socially Responsible Computing TAs) are responsible for integrating ethics and responsible CS curriculum into the homeworks and lectures. They work in tandem with the Lecture TAs and the Homework TAs to evaluate which parts of the course would benefit the most from ethics integration and determine how to best effectively deliver this content within the student learning environment. This job is great for someone who is interested in thinking about the course content as it applies to broader, more real-world, more human contexts and is interested in staying up-to-date with recent security-related events.

Each STA should hold 1 hour of Clinic a week.

A Advice for holding hours

Here's some general advice on how to lead TA hours effectively:

- Listen to their question and understand what they are asking
- Answer their question, but avoid blatantly explaining the entire solution. Use the Socratic method
- Ask leading questions, see where the student is at, make sure everyone understands prerequisite information before moving on
- Be open to whatever technique the student is using; don't force your way of thinking upon them. If upon further examination, you determine that their approach isn't feasible, you can suggest that they look at the problem from another angle—but remember that many of these problems can be solved in multiple ways

It's okay if you don't know the answer every now and then. Here are some tips to help you in these kinds of situations:

- Walk through the problem again, ask questions, tell the student what you do know
- Ask a nearby co-TA or on Slack
- Refer student to Piazza or follow up via email (if the latter, do so by end-of-day)

Ultimately, it's better to tell the student that you don't know the answer to something than to give an answer that isn't correct. It's important for us to stay consistent as a staff, and misconceptions can stick with students for life if they're not corrected! (If you accidentally misinform a group of students—it's okay, just make sure to make a correction post on Piazza as soon as possible.)

B Credits

B.1 For this document

The current version of the guide has been updated for the Spring 2021 semester by Zachary Espiritu (`zspirit`) and William Schor (`wschor`).

This guide was initially written following the Spring 2019 semester by Zachary Espiritu (`zspirit`) with contributions from Zachary Kirschenbaum (`zkirsche`). It was updated in Spring 2020 by Zachary Espiritu (`zspirit`) and Olivia Langley (`olangley`).

Some sections of this guide have been adapted from material in the department-wide UTA Missive.² The format of this guide was adapted from Jessica Su's "CS 161 TA Manual".³

²<https://cs.brown.edu/courses/ta/pubs/>

³<https://cs.stanford.edu/~jtysu/manual.pdf>

Finally, many of the recommendations in this guide are credited to the countless number of talented, capable, and simply awesome UTAs and HTAs who we've been fortunate enough to cross paths with at Brown during our undergraduate career. We regret that attribution for each of their specific influences is not possible, because without them, we would not have been able to write this guide.

B.2 For the course

CS166 was first offered in Spring 2006. Depending on how you count, the Spring 2021 iteration is the 15th or 16th offering of the course. (In Spring 2015, instead of teaching CSCI1660, the department offered a new course, CSCI1950E: "Computer Systems Security: Principles and Practice". This course ended up forming the basis for CSCI1660 from Spring 2016 onwards, so the staff from CSCI1950E is credited below.)

Including the staff of the Spring 2021 offering, CS166 has had approximately 17 professors (2 unique), 20 Head TAs (15 unique), 10 Grad TAs (9 unique), 2 Ethics TAs, 73 UTAs (71 unique).

- Spring 2021.** *Professor.* Bernardo Palazzi (`bernardo`)
Head TAs. William Schor (`wschor`), Zachary Espiritu (`zspirit`)
Grad TA. Lilika Markatou (`emarkato`)
UTAs. Abigail Siegel (`as130`), Charles Somerville (`csomerv1`), Charlotte Whatley (`cwhatley`), Erica Li (`eli32`), Jian Cong Loh (`jloh4`), Kento Nambara (`knambara`), Marcus Mitchell (`mmitch15`), Sierra Rowley (`srowley2`), Willem Speckmann (`wspeckma`)
- Spring 2020.** *Professor.* Roberto Tamassia (`rt`)
Head TAs. Olivia Langley (`olangley`), Zachary Espiritu (`zspirit`)
Grad TA. Lilika Markatou (`emarkato`)
Ethics TAs. Hannah Chow (`hchow`), Shawna Huang (`shuang19`)
UTAs. Abigail Siegel (`as130`), Andy Donzelli (`adonzell1`), Chanel Johnson (`cjohns18`), Hannah Chow (`hchow`), Mariya Gedrich (`mgedrich`), Milla Shin (`mshin7`), Nisha Khater (`nkhater`), Shawna Huang (`shuang19`), William Schor (`wschor`)
- Spring 2019.** *Professor.* Roberto Tamassia (`rt`)
Head TAs. Zachary Espiritu (`zspirit`), Zachary Kirschenbaum (`zkirsche`)
UTAs. Andrej Simeski (`asimeski`), Priya Lotun (`dlotun`), Hannah Baackmann-Friedlaender (`hbaackma`), Harrison Xu (`hxu6`), Kimberly Le (`kle2`), Linda Park (`lpark`), Olivia Langley (`olangley`)

- Spring 2018.** *Professor.* Roberto Tamassia (rt)
Head TA. Nina Polshakova (npolshak)
UTAs. Adam Horowitz (ahorowi2), Isaac Semaya (isemaya), Jearson Alfajardo (ja43), Julia Kim (jjk8), Harjasleen Malvai (hmalvai)
- Spring 2017.** *Professors.* Bernardo Palazzi (bernardo), Roberto Tamassia (rt)
Head TAs. Zoe Stoll (zstoll), Aaron Gokoslan (agokosla)
UTAs. Oussama ben Abdelbaki (obenabde), Justin Brower (jbrower), Anne Rothen (arothern), Jingyiping Zhang (jzhang12), Zach Dixon (zdixon), Memo Beltran (gbeltran)
- Spring 2016.** *Professors.* Bernardo Palazzi (bernardo), Roberto Tamassia (rt)
Head TA. Joshua Liebow-Feeser (jliebowf)
Grad TAs. Evgenios Kornaropoulos (evgenios), Giselle Lillie (glillie)
UTAs. Dan Haugh (dhaugh), Justin Brower (jbrower), Justin Bisignano (jtbisign), Jeremy Tong (jwtong), Natalie Roe (nroe), Zachary Zagorski (zzagorsk)
- Spring 2015.** *Professors.* Bernardo Palazzi (bernardo), Roberto Tamassia (rt)
Head TA. Joshua Liebow-Feeser (jliebowf)
UTAs. Dan Zhang (dz17), Gregory Chatzinoff (gchatzin), Jason Fedor (jfedor), Nicholas Lesniewski (nlesniew), Peter Cooper (peter)
- Spring 2014.** *Professor.* Bernardo Palazzi (bernardo)
Head TA. Jonah Stanley (jms11)
Grad TA. Ahmad Mahmoody (ahmad)
UTAs. DJ Hoffman (dj), Jake Ellis (jte), Alex Light (allight), Scott Kidd (shkidd), Jason Fedor (jfedor)
- Spring 2013.** *Professor.* Bernardo Palazzi (bernardo)
Head TA. Matthew Milano (matthew)
Grad TA. Foteini Baldimtsi (foteini)
UTAs. John Boreiko (jboreiko), Josh Brown (jwsbrown), Rathanak Chhay (rchhay), Neal Poole (neal)

- Spring 2012.** *Professors.* Roberto Tamassia (rt), Bernardo Palazzi (bernardo)
Head TA. Samuel Boger (sboger)
Grad TA. James Kelley (jakelley)
UTAs. David Kilian (dkilian), Douglas McErlean (dmcerlea), John Boreiko (jboreiko)
- Spring 2011.** *Professor.* Roberto Tamassia (rt)
Head TA. Samuel Boger (sboger)
UTAs. Nathan Partlan (npartlan), Nick Ratchev (nratchev), Jonathan Sailor (jon)
- Spring 2010.** *Professor.* Roberto Tamassia (rt)
Head TA. Saurya Velagapudi (svelagap)
UTAs. Alexander Heitzmann (aheitzma), Gregory Thompson (gnthomps), Jeffrey Pfau (jpfau)
- Spring 2009.** *Professor.* Roberto Tamassia (rt)
Head TA. Saurya Velagapudi (svelagap)
UTAs. Paul Meier (pmeier), Sean Murray (sem1), Yaou Wei (yawei)
- Spring 2008.** *Professor.* Roberto Tamassia (rt)
Head TA. Jonathan Natkins (jnatkins)
Grad TA. Jennie Rogers (jennie)
UTAs. Olin Gay (ogay), Gal Peleg (gpeleg), Paul Meier (pmeier), Ali Ozler (aozler)
- Spring 2007.** *Professor.* Roberto Tamassia (rt)
Head TA. Aurojit Panda (apanda)
Grad TA. Babi Papamantou (bpapaman)
UTAs. Aaron Myers (atm), Dan Kuebrich (dkuebric), Jacob Baskin (jbaskin), Jimmy Kaplowitz (jk)
- Spring 2006.** *Professor.* Roberto Tamassia (rt)
Head TA. Mike Shim (ssh)
Grad TA. Danfeng Yao (dyao)
UTAs. Jimmy Kaplowitz (jk), Aurojit Panda (apanda), Joel Weinberger (jweinber), Leo Meyerovich (lmeyerov)