Caltech

The Division of Physics, Mathematics and Astronomy

What does it mean to be a PMA TA?

Samuel Patrone (he/him)
Phys and Astro TA Fellow

Thorgal Hinault (they/them)
Mathematics TA Fellow

TAs are working with

Course

- Professor
- Head TA
- Recitation TAs
- Graders

Division

- TA Fellows
- Student Programs Office (SPO)
- Course admin

Institute

- CTLO
- CASS
- Dean's Office
- BoC

Kinds of Courses You will TA in PMA

Undergraduate Courses (Ma,(A)Ph < 100)

- Taught by a group of TAs (at times 8-10)
- You may be responsible for
  - rec sessions, office hours, grading and monitoring online message boards
- You may also be responsible for
  - writing solutions, conducting review sessions, building quiz problems, anything else the course needs

Graduate Courses (Ma,(A)Ph >= 100)

- Generally 1 TA
- May or may not have rec sessions
- You may be responsible for
  - office hours, grading and responding to student questions, write and/or solve problem sets

The math undergraduate curriculum

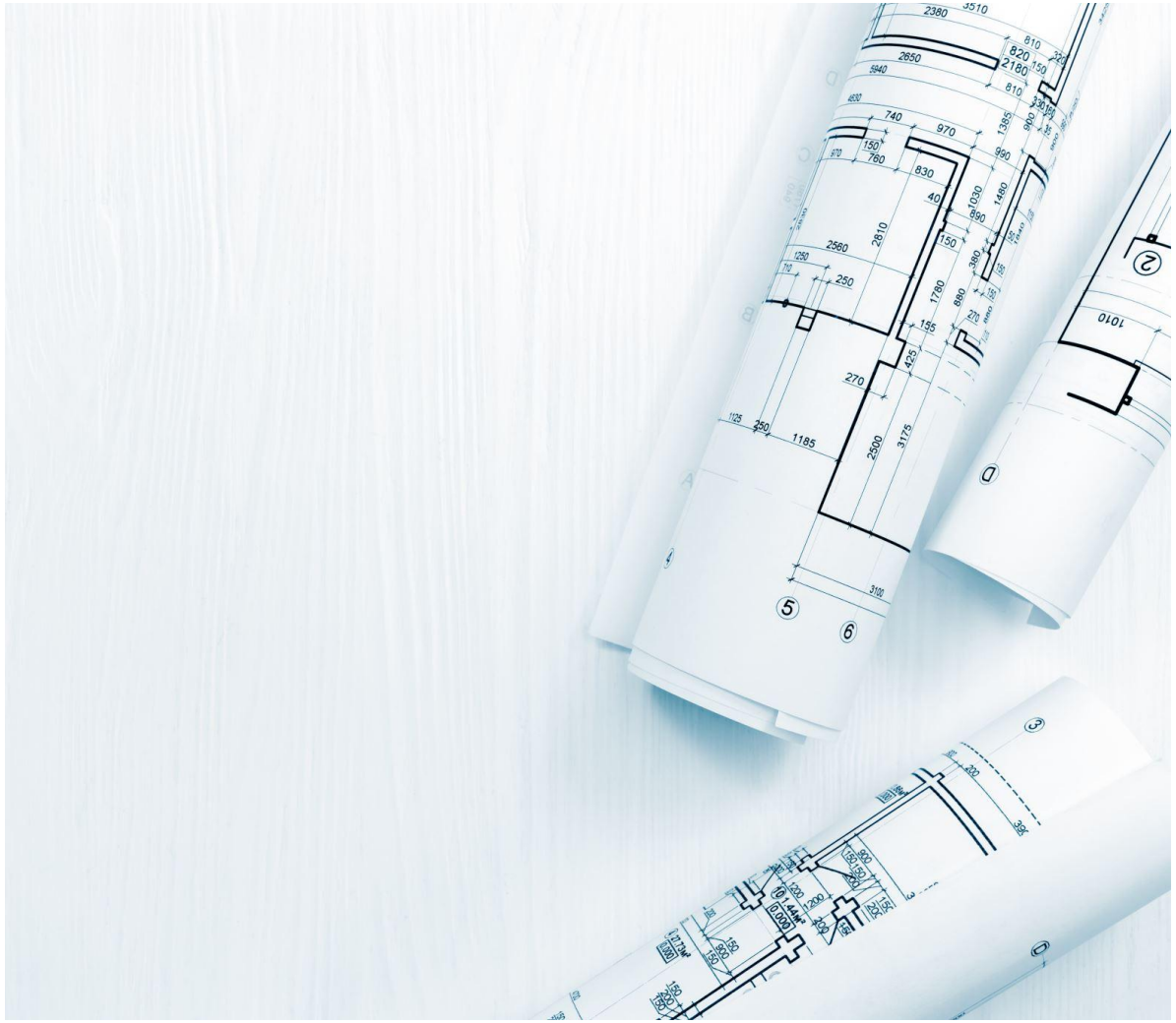
- **3 first year courses, mandatory for all majors:**
  - Fall - Ma 1a: **proof-based calculus**. There is one slower Section class for students with less background.
  - Winter - Ma 1b: **linear algebra**. Two tracks: practical (problem-solving) and analytical (more advanced).
  - Spring - Ma 1c: **calculus in several variables**. Two tracks: practical (problem-solving) and analytical (more advanced).
- **2 second year courses, mandatory for all majors:**
  - Fall - Ma 2: **ordinary differential equations**.
  - Winter - Ma 3: **basic probability**.
- **4 one-year undergraduate sequences for math majors (taken freely in year 2, 3 or 4):**
  - Ma 5abc: **abstract algebra**.
  - Ma 108abc: **analysis**.
  - Ma 109abc: **geometry and topology**.
  - Ma 6abc: **discrete mathematics**. A bit easier and also mandatory for CS majors.
- Math majors also need to take a **writing course**, a course on **giving talks**, and **2 graduate level** courses.

The physics undergraduate curriculum

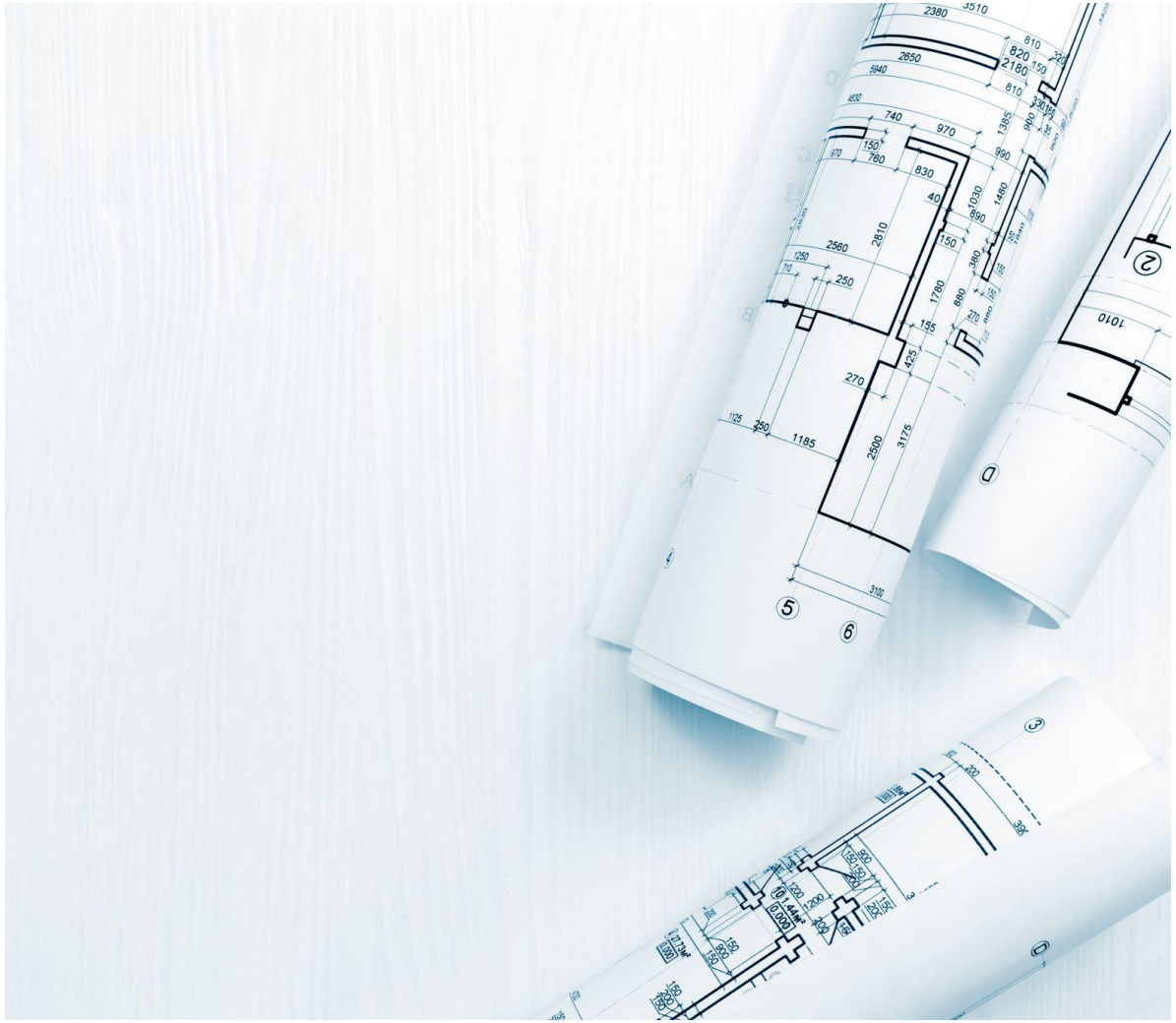
- **First year course, mandatory for all majors:**
  - Ph 1abc: **classical mechanics and electromagnetism**
    - Fall - Ph 1a: mainly Newtonian mechanics. One track only.
    - Winter - Ph 1b: electromagnetism and special relativity. Two tracks: practical and analytical.
    - Spring - Ph 1c: electromagnetism and special relativity. Two tracks: practical and analytical.
- **Second year courses:**
  - Ph 2abc: **waves, quantum mechanics, and statistical physics** (non-physics majors)
  - Ph 12abc: **waves, quantum mechanics, and statistical physics** (physics majors)
- Laboratory and Computational Physics Lab courses
- Ph 106abc: **topics in classical physics** (Hamiltonian and Lagrangian dynamics, etc)
- Ph 125abc: **quantum mechanics** (advanced level)
- Grad-level courses

Some Notes:

- **TA assignments** are managed by Student Programs Office (SPO).
- Make sure to talk to your Professor to make expectations clear.
- Do not convey administrative decisions to students without talking to Head TA/Professor.
- You are expected to work **up to 20 hours** a week. If you are working more let TA Fellows/SPO know asap.
- Both you and your students are governed by the Caltech **Honor Code**.
- If you have concerns about students, fellow TAs, professors, work conditions, etc. speak to your TA Fellow or PMA Contacts such as Nam and Belen.
- You are both an expert and a role model in the classroom.
- You improve as you teach. Just keep learning from your experiences.



What to do before you begin a course?



What to do before you begin a course?

- Find a copy of the textbook - the department should usually make one available for you
- Read through the syllabus for the whole term to build a map of what topics you will be teaching and how it connects with each other.
- Double check your recitation time and choose a good timing for the office hours

Each week during the course

Each week during the course

- Read the relevant lecture notes / textbook
- Go through the problem set
- Prepare notes for your rec session
- Complete any other expectations set by Head TA/ Professor such as grading, review sessions, etc.

What if you have questions?

- **If you have doubts about course content, please consult your Head TA/Professor**
- **If you want to know about general expectations, require general advice, interpersonal balance, consult:**
  - **TA Manual**
  - **PMA TA Website: pmatas.caltech.edu**
  - **TA Fellow**
  - **other TAs**
  - **PMA Undergraduate/Graduate Affairs and Course Coordinators**

Recitation Sessions

- Recitation sessions at Caltech actually involve a lot of Teaching. It's not just problem solving. You need to tie up concepts and subtleties backed by problems.
- Keep classrooms interactive and use techniques to engage your students
- Being prepared is key!
- Plan your boardwork.
- Make sure all your equipment works
- Flipped Sections?
- Ask student for feedback – what would be most helpful for them?

Office Hours

- Style: A casual problem solving assistance and a place to ask questions about course material.
- Have students explain what they've tried before giving hints.
- Try to give subtle hints.
- Do NOT give away solutions
- Follow the student's logic. Try guiding them to a solution which is based on the progress they've made.

The Honor code:

"No member of the Caltech community shall take unfair advantage of any other member of the Caltech community."

Academic Violation Examples:

- Exceeding the time limits.
- Use of references or other resources not allowed.
- Collaborating with others on an assignment beyond the scope permitted by the instructor.
- Using another's work, in whole or in part, without acknowledging the source and presenting that material as one's own academic work.
- Knowingly assisting another student in prohibited academic conduct.

The Honor code:

"No member of the Caltech community shall take unfair advantage of any other member of the Caltech community."

What to do?

- Review and collect material related to the (suspected) violation.
- You can talk with the head TA/instructor or with the TA fellow about it to get a sense of the severity of the action or the context in which this happened.
- Submit the Online Incident Referral Form.
- Let Caltech take it over from here!
- **Please, avoid direct confrontation** with the person involved in the violation.

The key: have a clear and exhaustive course policy

- **Extension policy:** Give a free number of extensions and/or drop sets to everyone (that they can report on eg Google Sheets), but do not grade more late sets than allowed.
- **Email policy:** Explicitly state the hours at which you can be expected to answer emails, and the time it can take you to answer.
- **Regrade policy:** For large classes, only allow a limited number of regrades per student.
- **Make no exception.**
- If you feel worried about a student's personal circumstances, reach out to the dean's office through a CARE referral.
- Make sure you and the instructor agree on the policy before the start of the term.

Maintain fair and healthy boundaries

- Every TA will encounter a certain amount of requests from students.
- Make sure that **your own time**, as well as **equity between students**, are respected.
- Some requests are reasonable, but you will necessarily run into situations in which students try to push boundaries and ask for **unfair advantage**.
- **Honor code**: no Caltech member should take unfair advantage of another one.
- Other Caltech members include **classmates** who are not making unreasonable requests, and just as importantly, **you**!
- Being too lenient on accommodations can also cause students to **fall behind** and eventually fail the class.
- **Know how to say no:** saying no is not unkind when it's in the interest of the student, their classmates, and yourself!

Examples of unreasonable requests

- A student has already used all their free extensions/drop sets and requests an extra one because they have too much work.
- A student emails you a few hours before a deadline to say they can't make it because they have a cold.
- A student emails you at 10pm to ask for a hint for a set that is due at midnight.
- A student goes over the time limit on their final and asks for you not to penalize them.
- A student submits a homework late and hopes to not be penalized for it ("ask for forgiveness rather than permission" tactic).
- A student expresses their frustration by being impolite to you or their classmates.

Diversity, Equity and Inclusion (DEI)

- **Be an example**: introduce yourself with your name, pronouns.
- Refer to students with their **preferred name and pronouns**.

- Make your teaching accessible to all students:
  - Challenge your **expert blind spot**
  - Foster a **growth mindset** amongst students
  - Make sure everyone has the opportunity to share ideas or ask questions
  - Student specific accommodation: CASS

- Provide various opportunities for **feedback**
  - Exit tickets
  - Mid-quarter survey
  - TQFR

- Resources:
  - CTLO
  - Caltech Center for Inclusion and Diversity
  - Equity and Title IX office

CASS, CARE and Title IX

CASS

Caltech Accessibility Services for Students

Reaches out to TAs before the term starts, with **specific accommodation** for a given student.

cass@caltech.edu

CARE Team

TAs can make **referrals** if they notice a student is showing signs of distress.

careteam@caltech.edu

Title IX Office

Handles sexual misconduct, harassment, discrimination.

As a TA, **you are required to report** such situations to the Title IX Office.

Reports: can be done online and anonymously.

equity@caltech.edu

Resources

- **Belen Maria Hernandez**
  Undergraduate Affairs and Course Coordinator
  Division of Physics, Mathematics, and Astronomy
  B122 Bridge Annex, belenmh@caltech.edu
- **Nam Ung**
  Director of Student Programs
  Division of Physics, Mathematics, and Astronomy
  B161 W Bridge, namung@caltech.edu
- **Mika Y. Walton**
  Graduate Student Affairs Coordinator
  Division of Physics, Mathematics, and Astronomy
  B161 W Bridge, mika.walton@caltech.edu
- **Melissa Dabiri**
  Associate Director for University Teaching, CTLO
  Center for Student Services, mdabiri@caltech.edu

Resources

- **Math TA Fellow**
  Thorgal Hinault
  thinault@caltech.edu
- **Physics & Astro TA Fellow**
  Samuel Patrone
  spatrone@caltech.edu
- PMA TA website – https://pmatas.caltech.edu/
  - TA manual (sign in with your caltech credentials)
  - Checklist for teaching a course
  - Recitation Sessions
  - Grading