



Faculty of
Engineering

Teaching Assistant Training

Preface

This manual is intended to summarise the information conveyed in the McMaster Engineering TA Training Workshop, as well as introduce some additional information which is not covered. TAs play an essential role in the teaching team for each course at McMaster University. Due to the smaller class sizes TAs usually observe, as opposed to instructors, TAs have a unique opportunity to interact with the students more directly, evaluate the students' knowledge level and provide immediate feedback. Being a TA is also a very valuable opportunity, as it provides an excellent venue to enhance your interpersonal skills, as well as develop a teaching portfolio. This manual is broken up into three sections, first of which discusses some of the important general information as it pertains to being a TA. Following this, a discussion of common grading philosophies and techniques, as well as the various challenges which may be faced while grading, are presented. Finally, relevant information as it pertains to teaching and some valuable approaches to preparing a tutorial/lab are discussed.

General TA Information

Duties and Responsibilities of a TA

The TA is an instrumental part of the teaching team as they work with students more directly and have the opportunity to directly assess the students' knowledge of the course material. That is why it is the responsibility of the TA, in all their roles, to take the time to evaluate the overall understanding of the students and relay that information to the rest of the teaching team, including the instructor. With this feedback, the teaching team can tailor the delivery of the course (including lectures, tutorials, labs, assignments, etc.) to concentrate resources where the students need them most. Some possible roles in which the TA may interact with the students include:

- Tutorial Leader: Facilitates discussions around course content and possibly works through problems with students.
- Laboratory Leader: Leads laboratory experiments with students, reinforces content students may have learned in a course and evaluates reports.
- Marking Assistant: Provides feedback to students through the grading of assignments, midterms and exams.

While these are the common roles of a TA, each course has unique requirements and each instructor runs their courses a little differently, making every TA assignment unique, offering different challenges. This is why every TA sits down with the instructor of the course at the beginning of the semester to discuss what specific roles the TA will perform and how the TAs hours will be distributed.

'Hours of Work' Form

As discussed above, at the start of the semester, the TA and the instructor will meet to discuss the various roles the TA will perform and how much time the TA will devote to each role. At this time, the distribution of hours is formally agreed upon using the 'Hours of Work' form, which is then signed by both the instructor and TA. In addition to the distribution of hours, it is also important that the TA discusses with the instructor when they will be required to perform each role (i.e. run a tutorial on Thursdays from 2:30 to 4:30, or large volumes of grading the week after the midterm), as a TA assignment always takes priority over other responsibilities (i.e. research activities and conferences). This means that if the TA of a course is required to attend a conference with their research group the same week as a large volume of grading is to be completed; they may not be able to attend the conference. This is why it is important that the TA communicates with the instructor at the beginning of the term when they will be required to perform their role. In some cases, the instructor may try to alter the TA's role to avoid conflicts with the other commitments, but they are not required to. If the TA is unable to meet the obligations of the TA assignment, they should forfeit or postpone their TA assignment at the beginning of the semester

It is important that the TA keeps track of the number of hours they spend on each role throughout the semester in order to identify unexpected deviations from the allotted time. The TA should be proactive in bringing these deviations to the attention of the instructor, and not wait until they have already exceeded their assigned number of hours. For example, if the TA is expected to spend a total of 60 hours marking two midterms, yet it took 45 hours to mark the first midterm, the TA should notify the instructor as soon as they can. The instructor should work with the TA to redistribute the remainder of the hours so that the TA does not exceed the assigned number

of hours of the TA assignment. In some cases, the department may offer the TA more hours to complete the task. However, this is not something that can be done after the TA has exceeded the allotted hours.

Emails and Office Hours

All email communications should be done through the McMaster email services. Meaning, when a TA is communicating with students or other members of the teaching team through email, they should always use their McMaster (@mcmaster.ca) email. In addition, if a student sends an email from a non-McMaster email, send a response asking them to resend the email from their McMaster email account. When communicating through email, remember to be courteous and maintain a professional tone. Emails can be used to protect the university, TAs and students from any accusations of misconduct, as emails can be used as evidence by the university and the courts.

As part of a TA assignment, the TA is often asked to hold office hours, which is usually one or two hours a week, where students can come and ask questions about any aspect of the course material. It is important to encourage students to come to the office hours and discuss any issues they may have, and not wait until just before an exam. Office hours are a great venue to discuss course material covered in lectures, homework, sample problems or practical applications of the concepts covered in the course. However, the TA should not discuss the content covered in or the format of the exam. Office hours are also not for editing or proof-reading upcoming assignments. If a student does come with an assignment and asks the TA to look at it, let them know that 'Unfortunately, TAs cannot review upcoming assignments, but if they have any specific questions about the content, you would be happy to answer them.'

Freedom of Information and Protection of Privacy Act (FIPPA)

The part of the act which most applies to TAs is the *Protection of Privacy*. As part of a TA assignment, the TA may be privileged to some of the student's personal information (Names, student numbers, grades, etc.). As a result, there is an expectation of privacy which must be adhered to, which is legally covered by FIPPA. Common practices include:

- Do not link student's ID numbers and names.
- Do not post class lists detailing students' grades. Make sure that grades written on assignments are not visible along with the student's name or student number.
- Do not distribute students' emails and ensure all class lists are "bcc'd" on any communication made to multiple students.
- Only email students through their registered McMaster email.
- Do not discuss one student's work with another. Students may attempt to discuss their grades in the context of another student's performance ("My friend made the same mistake on the assignment and they got an A"). TAs are not free to discuss one student's performance with another nor disclose any information about one student to another, even if both students are present.

Academic Dishonesty

Academic dishonesty is taken very seriously at McMaster University. It is the responsibility of the TA to bring any suspicion of academic dishonesty to the attention of the instructor. Under no circumstance shall the TA address the student themselves. Academic dishonesty is the responsibility of the instructor. The instructor should address the student and pursue further recourse, including bringing the suspicion to the Office of Academic Integrity. If academic dishonesty is suspected, the TA should continue to mark the student's work as if the student did not cheat, but **do not** post the grade before bringing the suspicion to the attention of the instructor. The TA's role is to liaise with the instructor to work towards a resolution. However, if the TA believes that the instructor did not deal with the issue properly and further action should be taken, the TA can bring the suspicion to the attention of the department chair. The TA can bring the suspicion of academic dishonesty directly to the Office of Academic Integrity but it is strongly encouraged to let the faculty member (instructor or chair) deal with the issue.

Health & Safety

By law, if an employee (including a TA), does not feel safe, they have the right to refuse to work, without consequence to their employment. The first action which should be taken if the TA does not feel safe is to speak to the supervising instructor. Almost every issue should be resolved by the instructor, either by alterations to the working environment or through education of safe practices and procedures. If the TA is not satisfied that the instructor's actions were sufficient, the TA should bring their concerns to the attention of the department's Health and Safety Committee (HSC). The Health and Safety Committee is a group in every department who meets regularly to ensure all working conditions are safe. This issue will be addressed and brought to the attention of the Joint Health and Safety Committee (JHSC) of the university, who will conduct a formal investigation and will ensure the environment is safe to work. Once the JHSC has concluded that the environment is now safe to work, the TA is required to return to work. Failure to do so may result in termination of employment. If the TA is not satisfied with the actions of the JHSC and still does not feel safe, they should contact the Ontario Ministry of Labour.

During a tutorial or lab, it is the responsibility of the TA to know the safety and emergency procedures for the building and equipment they are working with. Additionally, any unsafe behaviour or potential safety hazards should be identified by the TA and dealt with if possible and the instructor or supervisor notified. Relevant safety information can be obtained on the Environmental and Occupational Health Support Services ([Health, Safety & Well-being](#)) website, as well as by speaking with the instructor. Relevant safety information includes; fire alarm procedures, the location of emergency exits, fire extinguishers, emergency phones, first-aid kits, eyewash stations, etc. In the case of an emergency, 911 services may not be familiar with the buildings on campus, as they only have a list of building numbers. Therefore, in the case of an emergency ON CAMPUS, either dial '88' on any McMaster telephone, or 905-522-4135 from a cell-phone. This is the number for campus security, who are trained to get the emergency services, including firefighters and paramedics, to the scene of the emergency as quickly as possible. '88' can also be called if there is a minor emergency which may not merit calling an ambulance. Campus Security will either assist with the emergency themselves or dispatch the Emergency First Response Team (EFRT), who is a group of medical students trained to deal with medical emergencies on campus. All of these services are available at all times.

Harassment and Discrimination

The university has two policies related to dealing with harassment and discrimination. The broader policy is the “McMaster Policy on Discrimination and Harassment: Prevention & Response”, while the policy that deals specifically with sexual harassment and violence is the “McMaster Sexual Violence Policy”. These policies make the following definitions for harassment and discrimination:

Harassment means engagement in a course of vexatious comment or conduct that is known or ought reasonably to be known to be unwelcome. “Vexatious” comment or conduct is comment or conduct made without reasonable cause or excuse. Harassment includes Sexual and/or Gender-Based Harassment and Workplace Sexual Harassment.

Discrimination means an unjust or prejudicial form of unequal treatment, whether imposing extra burdens or denying benefits, based on any of the grounds articulated in the Human Rights Code. It may be intentional or unintentional. It may involve direct actions that are discriminatory on their face, or it may involve rules, practices or procedures that appear neutral, but disadvantage certain groups of people (systemic discrimination). Discrimination may take obvious forms, or it may happen in very subtle ways. Even if there are many factors affecting a decision or action, if discrimination is one factor, then that is a violation of this Policy.

These policies at McMaster expressly prohibit any discriminatory or harassing action and/or conduct, verbal or nonverbal, directed at or about one or more individuals or groups that creates an intimidating, hostile or offensive environment, or interferes with academic or work performance, in a manner that exceeds the bounds of freedom of expression and academic freedom.

The protected grounds as articulated in the Human Rights Code are:

“Age, Ancestry, Colour, Race, Citizenship, Ethnic origin, Place of origin, Creed, Disability, Family status, Marital status, Gender identity/expression, Receipt of public assistance (in housing only), Record of offences (in employment only), sex (including pregnancy and breastfeeding) and sexual orientation.”

Should a student wish to disclose to a TA, information on an incidence of discrimination, harassment or sexual violence, the policies outlines the actions that TAs should take. The “McMaster Policy on Discrimination and Harassment: Prevention & Response” says TAs who become aware of an issue, incident, or complaint of a potential violation of the policy must:

- a) *inform individuals coming forward of the reporting requirements and limits to confidentiality that apply to them;*
- b) *refer them to the faculty or staff person who has formal oversight of the designated area, and/or the appropriate Intake Office; and*
- c) *inform the person with formal oversight of the potential violation.*

The “McMaster Policy on Sexual Violence” says TAs who receive disclosures must:

- a) *inform individuals coming forward of the reporting requirements and limits to confidentiality that apply to them;*
- b) *contact the Sexual Violence Response Coordinator for guidance, and report the Disclosure (without providing identifying information unless the individual has given permission to do so); and*
- c) *refer the individual to the Sexual Violence Response Coordinator.*

Given the above responsibilities, it is imperative that any student who wishes to disclose any information should be made aware that TAs cannot keep information relating to harassment, discrimination sexual violence confidential before they disclose any information to the TA.

Should the student still decide to disclose the information to the TA, the TA must refer the student to the Course Instructor, the Equity and Inclusion Office or the Sexual Violence Response Coordinator. The TA should then report the information to the Course Instructor. Should the disclosed information be in regard to the Course Instructor the TA must report the information to the Head of the Department or Associate Dean, Academic.

The university takes the safety and wellbeing of its students and employees very seriously. If TAs themselves experience any instance of discrimination or harassment based on race, gender, sexuality, religion etc. from students or staff, they should report it to the Equity and Inclusion Office on campus. Any reports made are dealt with in such a manner that people remain anonymous to those they are reporting. Reporting an instance will prevent such incidents occurring to others in the future. If a TA is unsure whether what they are experiencing crosses the line into an actionable offence, do not hesitate to contact the Equity and Inclusion Office, who has officers who can help assess the situation. Visit <http://equity.mcmaster.ca/> for more information

Bias

Biases are any preconception or prejudice against one person or group relative to another based on personal experiences or knowledge. It is essential that TAs recognize their biases and proactively manage them such that they do not impact their ability to fairly and consistently treat and evaluate students. Biases are also not necessarily negative, as positive biases can also influence the way a TA treats and evaluates students. Biases can broadly be categorized into *explicit* and *implicit* biases. Explicit biases are those which one is aware of. For example, as a TA, one may personally know one of the students in their class and may treat them differently as a result. Explicit biases can be deliberately regulated and should be raised to the attention of the course instructor by declaring a conflict of interest. Implicit biases are feelings which are involuntary and one is often unaware they have such biases. These types of biases are unintentional and often very difficult to regulate and/or avoid. Implicit biases are a result of the mind processing large amounts of data and making many unconscious decisions every day. These decisions are made based on instinct which is based upon past experiences and knowledge.

Dealing with implicit biases should first involve educating oneself on what one's biases are. One excellent tool which is widely recognized for effectively evaluating such biases is the Implicit Bias Test, first developed at Harvard University. The test can be found at <https://implicit.harvard.edu>, and involves a number of short 10-minute modules for evaluating various types of biases. Once one is aware of their biases, various types of mitigation strategies can be utilized. Some common approaches include,

- Active reflection
 - o Repeatedly reflect and reassess one's biases to ensure they are not influencing one's decision making
- Stereotype replacement
 - o Think about the stereotype one holds and actively replace it with accurate information
 - o If one thinks that men are bad drivers one should actively acknowledge that women and men have similar rates to driving incidences.
- Positive counterstereotype imaging
 - o Picture someone who counters one's typical stereotype
 - o If one thinks that men are bad drivers one should think of a man one knows who is a good and conscientious driver.

- Individuation
 - o Use specific information about the individual to counter the stereotype
 - o If one thinks that a man will be a bad driver because “men are bad drivers”, think of information about that individual and ask related questions: “Are they generally reckless?”, “Are they careful in other areas?”

In particular, as a TA, there are also a number of best practices which should be exercised to help avoid biases,

- Do not rush marking, spend the same amount of time on each evaluation
 - o Most biases occur while rushing because one is looking for shortcuts
- Apply consistent and objective criteria
 - o Biases are most prevalent when subjective criteria are being accessed
- When possible challenge one’s first impressions and justify decisions to yourselves
 - o Often and repeatedly re-evaluate bias
- Incorporate examples in teaching which counteract stereotypes

Grading

What is grading aside from assessment?

Grading is the most common form of communication between the instructor and students. Grading is primarily about assessing the students' level of knowledge and relaying that information to the students and the instructor. The capability of the students is useful insight for the instructor, who can then adjust the delivery of the course material accordingly. The student gains from the evaluation by learning what areas of the course they need to work on. In these ways, grading becomes more than a "ranking" of students and more of a method of communication between the students and instructor.

Feedback

Feedback takes the form of short explanations that grading TAs writes on assignments and exams while grading. These notes are used to indicate where a student lost marks or to clarify a point the students did not completely understand. This feedback indicates to the student where they went wrong and helps them find what they might have misunderstood in the material. Feedback also gives the student insight as to how their final grade was calculated, informing them that their grade was not subjectively determined. If a student wants to challenge how their answer was graded, feedback helps TAs quickly understand why they awarded the marks as they did. With feedback, a TA can quickly correct any mistake they made or further explain to the student how their final grade was calculated.

Consistency and Fairness

Consistency in grading can sometimes be difficult to achieve. As part of a grading TA's duties, they are responsible for ensuring that every assessment is treated the same. However, this is often difficult for a variety of reasons, including:

- Having to break a grading session over multiple days, which can have the grading TA in different mindsets while grading
- Having to grade for long period of time, which can cause grading TAs to become tired or irritable

The grading TA has to avoid letting such mindsets influence their grading. Setting aside specific time for grading and not grading for too long can help maintain consistency.

Grading TAs should treat each student equally while grading, no matter the personal biases towards the student. This can be difficult as, over the course of a semester, the TA will get to know and may even form opinions of a number of students. A student may consistently submit sloppy work that is annoying and difficult to grade. It can be tempting to devote less time to a student who submits poor quality work. However each student's answer should be treated as an individual piece of work with the student's past performance not influencing a TA's judgment.

Grading consistently and fairly can also become difficult as schedules become busier. By the end of the semester, things get busy for TAs; Exams, projects, research and usually an increase of grading to do. TAs have to be diligent and give their teaching assignment focus and effort regardless if they are busy or stressed due to outside factors.

Reviewing Grades

TAs should always be open to reviewing their work. Some students are very motivated to get exceptional grades and as such, can frequently petition a grading TA in the hopes of receiving even a small increase in their grade. Frequent visits by a single student arguing for small percentages can get frustrating, but TAs must treat each visit independently. No matter how frequently they ask, the TA must assume that the student has a valid reason when asking for the grading of their work to be reviewed.

Students may present reasons as to why they should get leniency from the grading TA (e.g. 'They were sick', 'There was a bereavement in the family' or 'There was a clerical error'). Unfortunately, the TA is not at liberty to evaluate these reasons, nor provide exceptions for students. There are formal processes to deal with these scenarios and such reasons must be cleared by the instructor before a TA can act on them.

It is not uncommon for a grading TA to change a posted grade; they may have made an error inputting the grades, they may have fixed a mistake in grading a student's assignment, etc. A grading TA should establish the policy of editing posted grades in their initial meeting with the instructor at the commencement of the semester. Before updating any grades, the TA should talk to the instructor and let them know of any changes they wish to make.

Many instructors will require that the TA for the course develop a grading scheme for each problem they are grading. Sometimes, after returning the work to the students, the TA can be made aware of a mistake in their grading scheme. The TA must deal with that error and make the instructor aware of the mistake. The instructor will often let the TA know how to deal with such an issue, often by either adjusting the awarded grades to all students or in some cases requiring the TA to re-grade parts of the question.

Grading Assignments vs. Exams

An exam worth 40% of a final grade and an assignment worth 1% are very different methods of assessment. Given the difference in assessment, grading should be done given the context of what is being graded. There are obvious differences between exams and assignments:

Exams	Assignments
<u>High stress, little time</u> Exams are an assessment of the student's knowledge of a large amount of material over a short time.	<u>Ample time, lots of resources</u> Students have days to complete assignments with access to libraries, computers and the internet.
<u>Messy, poorly structured answers</u> With the limited time of an exam, students may not always manage their time well. They might find they have to rush to complete questions and cannot devote much effort to how neat or organised their answer is.	<u>Neat and professional</u> It is fair to expect that the assignments students hand in are laid out in a neat and professional manner as they have the time to review and rewrite them. If necessary, TAs can assign marks to presentation and legibility for assignments.
<u>Calculation errors</u> Simple calculation errors may not be caught by students who are focused more on the method or answering questions. With the limited time of an exam, they may not be able to review their answer to correct calculation errors.	<u>Reviewed calculations</u> While the method used to answer the question should be what the grading TA is marking, it is not unfair to award significant marks to correct answers.

<u>Worth more</u>	<u>Worth less</u>
Exams are worth more to a student's overall grade. As they are worth more, a TA should spend more time marking them, taking time to decipher messy writing and tracking calculation errors through the answer	As assignments are not worth as much as exams, TAs should spend relatively less time marking them. It is not unreasonable to assume TAs will not follow through every calculation when marking assignments, however, will identify areas where students went wrong.

The grading TA should understand the differences between grading exams and assignments and grade them with the given context. TAs should spend more time grading exams and doing their best to assign the mark the student deserves. However, with assignments, it is not unfair to expect the students to have presented the material in such a manner that is easy to follow and does not require as much time to decipher.

Grading Philosophies

A grading philosophy is a term that describes a hierarchy of values regarding the weighting of grades towards various aspects of a student's work. Some common examples of grading philosophies include:

- The solution method is the most important part of an answer
This is a very common philosophy used in science-based subjects where there is a set methodology to the solution that must be followed. This grading philosophy awards the steps taken towards the solution the highest.
- That a neat, well presented, answer is what deserves marks
If a solution is not easy to read or isn't well structured, then it does not deserve a good grade. This is not the most common grading philosophy encountered in engineering. It is quite relevant to projects and reports where presenting information cogently and professionally is important.
- The final result is the most significant part of a solution given that, in industry, that is what counts
This grading philosophy heavily weights the marks awarded to the final result of the answer. This style of grading philosophy is sometimes used when the student has to display some engineering judgement depending upon the result of their calculations.

Everyone has an idea of what is the most important aspect of a solution and thus everyone has their own grading philosophy. For most courses the grading philosophy should be established by the instructor and the grading TA should strive to emulate it. It is important that grading TAs talk to instructors at the beginning of a teaching assignment to gain an understanding of their grading philosophy. The grading philosophy established by the instructor should be what dictates how an answer is graded, or how a grading scheme is developed.

Developing Grading Schemes

Some instructors provide TAs with very thorough grading schemes to the problems they are to mark. However, most instructors expect the grading TA to develop grading schemes for the problems they will be grading. While there is no substitute for practice when it comes to developing grading schemes, there are some basic steps that can be followed.

Before developing a grading scheme, the grading TA should read through a few answers without awarding marks. This first pass is to inform the TA as to how the students approached the question. From this, the TA should see how the students are solving the problem and what the crucial or difficult steps are. With knowledge of how the students solved the question, the TA should develop a grading scheme that distributes marks between those steps appropriately.

The marks should be divided so that a correct solution and understanding of the material is rewarded while reflecting the grading philosophy of the instructor. Before making any grading scheme, it is extremely beneficial to establish what the instructor finds important in a solution. If possible, obtaining marked answers from previous years or to different questions, can help inform a TA what the instructor thinks is important.

While marking, if a student takes an approach which is not covered by the marking scheme, such as a different, but valid solution method, the TA should deal with it as best as possible within the framework of their grading scheme. It may be necessary to create a separate grading scheme for solutions that deviate substantially from those already encountered. A note should be made as to how the grading was different should it be encountered in future answers to maintain consistency.

Grading Schemes and Rubrics

The vast majority of grading TAs in engineering are grading exams and assignments that are arithmetic in nature, and deal with the manipulation of formula and numbers. Marking such work is often conducted using well-defined grading schemes that are similarly formulaic in nature. However, other assessments such as reports, projects, and presentations are difficult to evaluate using a rigid and formulaic grading scheme. Rubrics are very useful when grading such assessments, as they can be tailored to assign grades to ideas and concepts rather than numbers and specific steps. They are created by categorising answers and defining what meets the criteria of an acceptable answer. Rubrics can be loosely defined or quite rigid in how they assess concepts depending on the requirements.

Teaching

Basic Tutorial Info

In many cases, the TA will take on a teaching role leading a tutorial or laboratory experiment, while the instructor will run the lectures. As such, it is important to remember the purpose of the tutorial/lab within the context of how the course is structured. Very often, tutorials and labs are used to reinforce content presented in lectures, not to introduce new content. Where lectures may have hundreds of students per class, tutorials often have at most 30 students per class allowing for students to ask questions they may not have the opportunity to during a lecture. It is important to take advantage of this by focusing on facilitating a discussion with the class and avoiding lecturing for long periods of time. This can be achieved by encouraging students to participate and challenging the students to think critically. This interaction with the students allows the TA to assess the student's level of knowledge.

Some possible roles the TA may perform during a tutorial or lab include, but are not limited to:

- 1) Introduce and/or reinforce course content: The TA may be asked to revisit some material that was presented in previous lectures.
- 2) Lead/demonstrate experiments: Most departments have lab courses to demonstrate some of the concepts presented in courses. The TA may be responsible for leading/demonstrating such labs while encouraging students to relate their findings to the course material.
- 3) Review assignment/homework questions: One of the most common roles of a TA in a tutorial is to walk the students through the solution procedure to sample problems. This provides an excellent opportunity for the students to get immediate feedback on sample problems. Some instructors encourage the students to solve the problems themselves during a tutorial, while the TA is there to assist if they get stuck.

Preparing for First Tutorial

Prior to the first tutorial/lab, the TA should consider some of the following questions and discuss them with the course instructor;

- What role does this tutorial/lab play in the course structure?
The TA should understand the intended purpose of the tutorial in the context of how the instructor wishes to run the course.
- What are the course goals/objectives?
It is important to remember that each tutorial should have a specific objective which should reflect and work towards the overall objective of the entire course.
- How do I get audiovisual equipment if I need to use it?
Often the instructor will have this information. However, each building has a central office which houses keys/passes/passcodes the TA may need. (i.e. J.H.E. has The Hub located in J.H.E. 216a)

During the first week of school, the students are introduced to a number of different courses, instructors and TAs. As a result, a very useful tool for the first tutorial/lab is to prepare a tutorial handout, which includes well-defined expectations of the students, office hours/location, contact information, email policy, etc.

Learning Environment

An important job for the TA is to set the tone for the classroom. This involves being courteous and professional with the students, as their behaviour will often reflect the TA's. It is essential to ensure that the classroom is a safe and inclusive environment, where all students feel comfortable contributing their ideas, views and concerns. While some TAs may wish to be more relaxed and casual with the students, it is important that this behaviour does not prevent the TA from establishing a positive learning environment. As the leader of the classroom, the TA should respond quickly and explicitly to disruptive behaviour and ensure all students are respectful and sensitive to the everyone's views. The TA should also be honest with the students, and admit if they are unsure the answer to the students' questions. It is always appropriate to say, "That is a great question, I am not sure at the moment, let me look into it and get back to you". Students are very appreciative of the honesty of the TA and it helps facilitate a civil and inclusive environment where not knowing an answer to a question is okay.

Keeping Students Engaged/ Focused

When speaking in front of a classroom, it is important for the TA to speak clearly and maintain eye contact with the students and avoid turning their back to the classroom for long periods of time. This encourages a two-way conversation between the TA and the students which is the goal of a tutorial or lab. It has been shown that a student's attention span is limited to 15-20 minutes, after which the student may lose focus on the tutorial/lab. Therefore, it is good practice to 'switch gears' every 15-20 minutes and avoid lecturing or performing an activity for any longer than this length of time. For example, a TA could break up a class discussion with a think-pair-share activity, where the students brainstorm ideas on a topic of a short period of time, then get into groups and share their ideas, and finally share their ideas with the class as a whole. This alters the format of the conversation and helps students keep engaged with the material.

When engaging students, it is important to ask questions which will ultimately encourage the class to participate. There are two key types of questions which a TA can use, open-ended and closed-ended questions. Open-ended questions are those which encourage students to elaborate on their answer in more than a simple one-word response and often requires the students to explain their thought process. Closed-ended questions only require a simple and direct answer. For example, 'How did you arrive at a solution to this problem?' is open-ended, while 'What answer did you get for this problem?' is closed-ended. Open-ended questions should be used most often as they facilitate the two-way dialogue and encourage students to participate and share their ideas. However, closed-ended questions are very effective and getting the classes attention, as you can pose one to the class in the form of a survey question (i.e. 'How many of you got "x" as the answer?').

Lesson Plans

Being prepared prior to each tutorial/lab is important in order to be an effective TA. One effective way to be prepared is to develop a lesson plan for each tutorial/lab. A lesson plan is an outline of the material being covered and the activities which will be used to convey that material. A lesson plan, should contain point form notes and be a summary, while not becoming a script. Lesson plans should also include times which will be devoted to each activity and should be used as a rough guideline so that the TA can deliver the tutorial on time and at an appropriate pace. With a lesson plan, the material can easily be presented in a logical and easy to understand manner, which ultimately helps the students digest the material. The BOPPPS model is a well-established framework for developing a lesson plan. This model is divided into the following sections; **Bridge**, **Outcomes**, **Pre-assessment**, **Participatory Activities**, **Post-Assessment** and **Summary**. The following is an outline for each section.

Bridge

- Gain the class's attention at the start of the tutorial
 - Gives students time to get settled
- Gain student's interest
 - Personal anecdote, historical event, thought-provoking dilemma, real-world example, short video clip, practical application, probing question

Outcomes

- Introduce the purpose/objective of the tutorial
 - This should be one sentence
- What students will know/be able to do by the end of tutorial

Pre-Assessment

- Review previous tutorial/lab or content presented in class
- Limit to important equations and concepts
- Great opportunity to ask open-ended questions to get the class engaged
- Helps TA understand the current level of understanding

Participatory Activities

- Keep your original objective in mind
- Check for understanding
 - Ask questions throughout and try not to continuously talk
- Tip: Before solving problems with students, write notes and questions on the solution you are using to ask students as you are reading through it during the tutorial

Post-Assessment

- Provide opportunity for questions from the students
- Assess the student's knowledge
 - Open-ended questions

Summary

- Conclusion to lesson
- Review and reflect on material covered

Self-Assessment

As soon as convenient after the tutorial, while it is still fresh in the TA's mind, they should go through the tutorial and ask themselves some reflective questions that help them assess how it went and what can be improved. The idea with the self-assessment is to continuously be improving the delivery of material and getting better as a TA.

Possible questions include:

- What went well? Why?
- What needs work? How can I improve on it?
- What should I review/reiterate at the start of the next lesson?

Student Scenarios

Non-Participating Student

As a TA for a Failure of Materials tutorial you are asked to work through various case studies of different famous mechanical failures with the students. The tutorials consist of discussions around the evidence provided to forensic engineers wherein the students are tasked with debating who is at fault for the failure. Over the course of the first month, you notice that there is one student in your tutorial who does not contribute to the conversation. The student follows the discussions in the classroom but does not volunteer any opinion on the material. Their lack of participation makes it difficult for you to assess their level of knowledge.

How do you deal with a Non-Participating Student?

Why are they not participating?

There are many reasons why students may not participate in class. The first step in encouraging participation is to identify the reason why a student may not be taking part.

- They may not have had an opportunity to read the assigned material
- They may simply be distracted by events outside the classroom
- They may be unclear about what the tutorial objective is
- They may be intimidated speaking in front of other students

How can a TA encourage students into taking part in the class?

A TA should not try to force a student to participate in a tutorial. The job of a TA is to create an inclusive classroom where everyone is free to participate. However, there are some small things TAs can do to encourage students to participate.

- Show of hands
Posing a question to the class and, by a show of hands, seeing who believes the answer is one of two or more options is an excellent and subtle way to get students participating in the classroom. TAs can further extend the conversation by asking if someone is comfortable explaining why they voted for their answer.
- Group work
If a student is uncomfortable in front of a full-sized classroom, they may be more comfortable participating in front of a smaller group. Having students work in smaller groups may help that student gain confidence participating in discussions, which would hopefully translate to full class discussions.

The Dominant Student

There is one student in your Network Analysis tutorial who is very eager to participate. They make an effort to volunteer the answer to any question before another student can. If other students are asked to explain a concept being covered, the student often interrupts, believing the other student isn't answering the question completely. Inevitably they end up taking over the explanation or discussion. If there is a class discussion, this student seems to be the most vocal overwhelming others in the larger conversation.

How do you deal with a Dominant Student?

- Call on other students directly/indirectly
If a student is consistently volunteering the answer to a question before other students have a chance, the TA can direct their questions to other students or other groups that do not include the dominant student.
"Nazanin, can you tell us why....?"
"Can anyone in the back explain where...?"
"Will someone we haven't heard from today tell us how...?"
- If the student continues to dominate the participation in the class, it may be necessary to ask to speak privately with them
Most often a dominant student does not see what they are doing as an issue. Often, they are just extremely eager to participate and excited to learn. Let the student know that their contributions to the class are appreciated. Explain to the student how their actions are affecting others in the class and their ability to contribute. Ask the student if, now that they are aware of the effects of their actions, they would work towards allowing other students to participate to the best of their ability.

The Disruptive Student

The numerical methods tutorial you are assigned mostly consists of solving problems, so students become familiar with solution methods for the course. However, you find that the classroom is often disrupted by one student. This student can usually be found at the back of the classroom reading the newspaper or laughing at YouTube videos on their phone. They often try to involve nearby students in a conversation about an article or video. When this student does participate, they are often contentious towards the material and the method you are proposing. They challenge the class as a whole claiming that it is a pointless exercise in “academia” with no practical application.

How do you deal with a Disruptive Student?

- Ask the student if they have a question
Asking a question is a quick method of letting the student know that their lack of engagement has been noticed. The interruption may cause the student to put away whatever is distracting them. Any conversations they may have started should stop if they are about unrelated topics. If it is a legitimate conversation about the material, the TA can provide an answer, cutting the conversation short.
- Do not tolerate disruptive behaviour
Disruptions to the classroom will make it more difficult for other students to focus and absorb the material being presented. If there is disruptive behaviour in the classroom, it is the TA’s job to stop it, so that the students can learn.
- Talk to the student after the class or during office hours
If the student is adamant in their disruptive behaviour, the TA should address it directly. Inform the student of the effects of their behaviour on the classroom environment. Tell the student that they cannot continue to be a source of disruption in the classroom and if they are unwilling to stop that they must leave.
- Get the student to leave
If the student is extremely disruptive to the class where it is affecting the TA’s teaching ability and they are unwilling to stop, the TA can ask the student to leave the classroom. If they refuse to leave, then the TA can call security (‘88’) to remove the student. This is an extreme scenario, but the TA should know this is an acceptable option available to them.

The Dependent Student

You are the TA for a second-year math course. Your TA assignment for this class is leading a tutorial and office hours every week. The TA assignment is going well and the class seems to be doing well aside from one student. This student often lingers after the tutorial to ask many questions, sometimes lasting 25 mins after the tutorial. This student also frequently comes to your office hours spending much of the allotted time with you asking further questions. The questions they ask are not limited to the tutorial, branching into other areas of the course, assignments and other questions that could be considered relatively basic for someone taking this course. They regularly come to the office with their partially completed assignment looking for confirmation that their answers are correct and for the solution if they are not.

How do you deal with a Dependent Student?

- The student may be missing a prerequisite for the course
Without the background material, the student would struggle with the advanced material. Let the student know that there are options available to them such as the ability to delay the subject for a term so they can take the prerequisite.
- Encourage the student to take responsibility
Offer the student resources other than the course material that they can pursue themselves (i.e. books in the library, online course material, YouTube videos, tutor services, etc.).
- Set firm bounds on the amount of time you can spend answering questions
Let them know how much time you have to spend (i.e. "I only have 5 more minutes before I have to help the next student"). Let the student know that the time outside of the tutorial or office hours is not part of the TA assignment and answering their questions outside of the allotted time is not feasible.
- Divide your time with the students equally
If other students come with questions during office hours or after the tutorial let the dependent student know that other students have to be given a comparable amount of time. Students might think that because they arrived first, their questions must be addressed before other students who arrived later.
- Let the student know what office hours are for
Office hours are for answering student's questions about the material in the course. Unfortunately, TAs cannot proofread assignments nor provide solutions to assignment problems which have not been graded yet.

The Complaining Student

You are the grading TA for a Thermodynamics course where your duty is to grade the weekly assignments for the course. There is one student that comes to you after each assignment is returned with complaints about how their assignment is marked. Their complaints are frequently about minor aspects of the solution where they think their answer can be interpreted as technically correct where you have marked it incorrect. They expend much effort each time to convince you to increase their marks, frequently citing their need to get a good grade in the class.

How do you deal with a Complaining Student?

- Hear the student out first then make a judgment
Even though the student is frequently coming with what seem like nuisance complaints the default assumption should always be that they have a valid concern about the assignment. Each instance should be judged on its merit where the previous claims do not influence the assessment of their concerns.
- Make sure that all of the students are aware of the marking scheme
If the student knows how the marks were awarded to their assignment, then they will understand why they got the grade they were given without having to ask the TA directly.
- Provide comments to the students on their assignment
Having notes on the assignment that is returned to them will help students understand why they lost marks and will be less likely to come to the TA to argue the point as they have already been provided with an explanation.
- Inform the student that if it is remarked the grade may increase or decrease
Students tend only to pick apart why they lost marks but haven't looked to ensure that they did the other parts of the assignment correctly. Let the student know that taking a closer look might reveal some other mistakes that were made on the assignment resulting in a lower grade after remarking.
- Don't re-grade on the spot
If the student is adamant that their assignment should be re-graded, then re-grade it over the next day or two before returning it to them, as opposed to re-grading on the spot.

Additional Resources

Campus Resources

Some additional resources which may be useful for a TA include;

- Student Wellness Center (x27700)
 - If a student seems ill or is in emotional distress.
- Campus Security (x24281 or 88 on any campus phone)
 - In the case of an emergency.
- Equity and Inclusion Office (x27581)
 - If you are experiencing harassment or discrimination at any level of the university.
- MacPherson Institute (x24540)
 - More teaching and learning resources.
- Health, Safety & Well-being
 - For any questions regarding the health and safety in the classroom.
 - For any training required by a department.