

Engineering Teaching Assistant Training

Chantel Millar and Connie Pelligra

Introduction

Intended Learning Outcomes

By the end of this workshop you should be able to:

- Describe and execute the various roles and responsibilities of a TA at McMaster
- Understand the importance of a teaching assistant knowing all aspects of being a TA (tutorial leader, lab leader, and marking)
- Identify good practices with respect to professionalism in TA-instructor, TA-student, and TA-TA relationships
- Develop the skills to efficiently and effectively grade and supply feedback for both technical and non-technical course material
- Develop lesson plans and rubrics that reflect learning outcomes of the course you are TAing
- Develop the skills to solicit feedback from the course instructor and students, complying with FIPPA and the Research Ethics Board

What does a Teaching Assistant do?

Think of a good TA from your time as a student, what made them a good TA?

- They are well prepared
- They are knowledgeable about the material
- They clearly defined the expectations
- They speak clearly and in an accessible manner
- They present themselves as someone who is approachable
- They are direct and concise in their delivery of the material

Some students arrive having not covered the material. How do you, as a TA, deal with students that are unprepared?

- Perform a quick recap covering the necessary theory
- Incentivise the students to participate
- Ask probing questions
- Have other students volunteer the information
- Make sure to reiterate the expectations
- Start a discussion around the background material amongst the students
- Sometimes the only option is to explain as the lab/tutorial progresses

Duties and Responsibilities of a TA

- Intermediary between faculty & students
- Roles of a TA**
 - Tutorial Leader
 - Laboratory Leader
 - Marking TA

***Your Role as a TA may change throughout the course of your TA term or graduate career*

- Duties and responsibilities of your TA placement should be a priority

Professionalism

- There are 3 main groups in which professionalism needs to be maintained (through communication, boundaries, etc.):
 - TA-Student Relationships
 - Emails, Office Hours, Grading, Tutorials
 - TA-Professor Relationships
 - Hours of Work Form, Emails, Academic Dishonesty, Rubrics
 - TA-TA Relationships
 - Emails, Rubrics, Grading, Tutorials

Hours of Work Form

- Details how many hours a TA will devote to each duty
- Filled out at the beginning of the term with the instructor (within 5 days of contract start)
- It is the TA's responsibility to continuously monitor their hours

APPENDIX "B": HOURS OF WORK FORM

The parties agree that this Appendix sets out the fields of information to be included in the "Hours of Work" Form.

The course instructor and the employee are to fill out this form in accordance with Article 12.03. If changes are required to this form or additional hours are required they are to follow the process in Article 12.04.

Academic Term(s):		Start Date (if not beginning of term):	
Dept / School / Unit of Employment:	Mechanical Engineering	Course Code:	MECHENG _____
Course Title:			
Employee Name:		Employee email:	@mcmaster.ca
Instructor Name:		Instructor email:	@mcmaster.ca

Check Classification: (See Schedule "A")	<input type="checkbox"/> "A" Employees holding an Undergraduate Degree	<input type="checkbox"/> "B" Employees not holding an Undergraduate Degree
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Duties	Approx. Hours	Details - Include nature of tasks and expectations of grading. Indicate any weeks where the projected workload is likely to vary from an average of 10 hours.
1. Leading Tutorials/Overseeing Laboratories/Field Trip Supervision		
2. Student Consultation (Emails, Office Hours)		
3. Grading (Marking, Entering Marks)		
4. Preparation (Reading, Attending, Lectures, Meeting with Instructors)		
5. Invigilating		
6. Other		

Hours of Work (fill in the blanks):

Specify total number of hours of work (between 32 and 260):
add 3 hours if work is for 1 term, add 6 hours if work is for 2 terms (i.e. 6 unit appointment).
TOTAL _____

Required Health and Safety Training Courses	I acknowledge that the mandatory health and safety training required for my Teaching Assistantship position, as outlined at: http://www.workingatmcmaster.ca/med/document/Training-Matrix-Teaching-and-Research-Assistants-1-36.pdf has been completed_or will be completed by the time my position commences. Enter Y or N	<input type="checkbox"/> Y
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We acknowledge that we have discussed duties and anticipated hours of work as above.

Employee's Signature _____ Date _____

Employment Supervisor's Signature _____ Date _____

Scenario A:

- You are a 0.5 TA (65 hours)
- You have been asked to mark the final exam but have no hours left for grading: What do you do?

Duties	Planned Hours	Spent Hours
Leading Tutorials/Overseeing Labs	20	20
Student Consultation	15	9
Grading	20	20
Preparation	10	8
Invigilating	0	0
Other	0	0

Scenario B:

- You are a full TA (130 hours)
- One month into the semester your hours of work are:
- What steps should you take?

Duties	Planned Hours	Spent Hours
Leading Tutorials/Overseeing Labs	45	15
Student Consultation	40	32
Grading	30	10
Preparation	15	5
Invigilating	0	0
Other	0	0

Emails

- Be professional and courteous
- Use McMaster email
- Emails are legal documents
- Set professional boundaries

What is Netiquette?

- Online etiquette = netiquette
- Standard for communicating and good behaviour on the internet
- Applies to all online communications (emails, online classroom, social media platforms)
- Take-away message: treat others with respect and act online as you would in person

Tips for Communicating Online

- Avoid writing in all capital letters
- Avoid using sarcasm or humour as it could be misinterpreted
- Ask for clarification if you would like help in understanding what an individual has written
- Be respectful
- Take breaks

Example Student Email

Midterm



Charlie Smith <goodguycs163@gmail.com>

To  Connie Pelligra



1:58 AM

Hello Dr. Pelligra,

I was very unhappy with my grade on last week's midterm. I don't think it was fairly marked at all. I followed all of the instructions the instructor gave us and I still did very poorly – are you sure you marked it right? It is just that I'm taking the class right now and I feel like I understand the material and I was wondering if maybe the class has changed since you took it?

Please respond to me immediately with details of my grade and why it wasn't higher,

Charlie Smith

Example Student Email

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Charlie Smith

Office Hours

- Encourage students to come to office hours
- Office Hours can be in person or remote; discuss with the course instructor to determine what fits the course best
- Office Hours can be held by appointment if the instructor approves
 - This can give you (the TA) more control over your time and may even make students more comfortable engaging with you (if they know the meeting will be private)
- What are some good/bad topics to discuss with students in office hours?

Office Hours Cont'd

- Some appropriate topics for discussion
 - Course material covered in lectures or tutorials
 - Homework or sample problems
 - Practical applications
- Some inappropriate topics for discussion
 - The content/format of the exam
 - Editing or proof-reading of upcoming assignments

Privacy

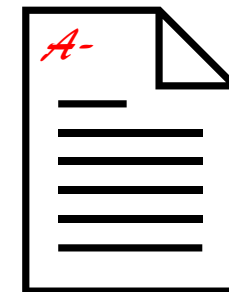
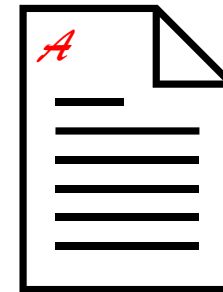
- PI is recorded information about an identifiable individual (i.e; name*, address, email*, phone #, race*, skin colour*, image of student*, student number, religion, sexual orientation, etc...)
 - *PI may be captured in video recordings and should be protected under FIPPA
- The purpose for collection of PI must be provided before or at the time of collection and used for that purpose only
 - ONLY authorized purposes not personal purposes

Privacy

- As a university employee you have the responsibility to follow strict rules when collecting, using and disclosing personal information (PI)
 - **FIPPA** (Freedom of Information and Protection of Privacy act) **consent-based legislation** meaning that consent is required before collection, use or disclosure to PI

Scenario C:

- You are a TA holding in-person office hours on campus
- A student comes into your office with their own marked assignment and one of their fellow students marked assignments asking to discuss the differences seen between the two papers. The other student is not present.
- In this scenario what should you do?

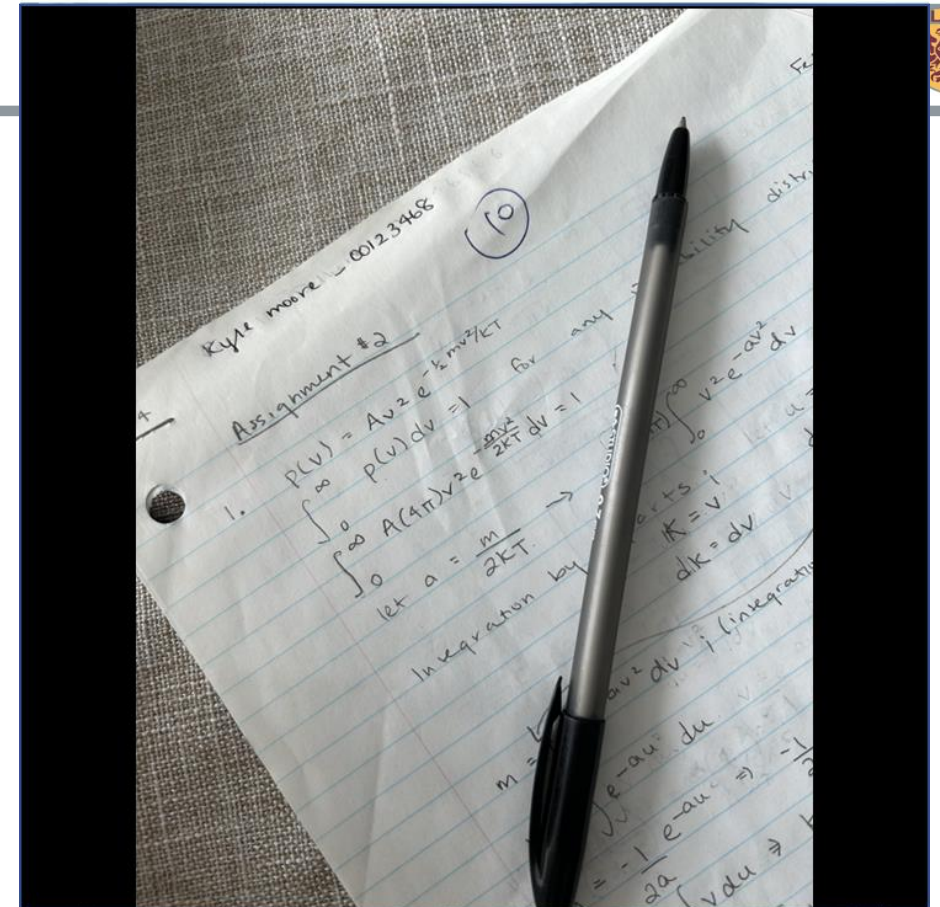


Scenario D:

- You are a marking/tutorial TA who has recently marked a set of assignments
- A student who has come to your office hours for guidance and was struggling with the course got 100% on the assignment!
- You want to show how proud you are of the student and choose to publicize their mark on social media! Is this OK?



amira_bec124



Liked by [jiji_jonsmith,ki](#) and 56 others
amira_bec124

So Proud of my student. @moore_k and what he has achieved!! Bravo 🙌

#teachingassistantingz #proudTA #thermodynamics

FIPPA

- Student Personal information (PI) must be kept private
 - ID#s, names, grades, email addresses
- Do not discuss one student's work with another student
- Anything with PI (student assignments, etc..) need to be deleted from our computers after the semester ends
 - Professors need to keep files for 1 year in case a student appeals a grade

Web and Virtual Privacy

- Video files do include the PI of those captured in the recording.
- When conducting TA duties virtually, some students may not feel comfortable activating their camera with a view to their home, and, in some cases, family members may be at risk of capture in course video use
- Before starting a video recording, include a statement informing the students of the recording and whether the video will be posted internally or externally
 - This statement may also include acceptance of learners deactivating their camera and microphone to avoid video capture in the recording, and using chat functions instead
 - Internal Video (FIPPA compliant) posting includes: MacVideo, A2L; External Video posting includes: YouTube

Tips and Resources for Teaching Remotely

Adapted from the MacPherson Institute

Privacy and Security Settings

- Be aware of this in any virtual platform you plan to use
- For example: Know how to mute the virtual class, mute an individual student, remove an individual student, and abruptly end the session for all students if need be

Educational Technologies

- Avenue to Learn*
- MacVideo
- Echo360
- Zoom: Web Conferencing
- Microsoft Teams
- PowerPoint – Present Live
- More information regarding available educational technologies
 - <https://mi.mcmaster.ca/educational-technology/>
 - <https://mi.mcmaster.ca/teaching-remotely/#tab-content-supported-tools>

Avenue to Learn

- McMaster's Learning Management System
- Serves as the course home:
 - Announcements
 - Course content
 - Discussion forums
 - Assignment submission folders
 - Grade assessment and feedback
- Online resources are available at: <https://avenuehelp.mcmaster.ca/>

Training Resources and Supports

- McMaster Teaching Assistant Guide
- Beginning of Term TA Q&As offered via the MacPherson Institute
- Online Workshops on the Professional Development in Teaching Hub (Avenue to Learn)
 - TA Professionalism, Rights, and Responsibilities
 - An Introduction to Avenue to Learn
 - Active Learning
 - Marking Efficiently and Effectively
- Forward with FLEXibility: A Teaching and Learning Resource on Accessibility and Inclusion: Modules 1, 2, 3 and 5
- E-Learning Section of McMaster's Accessibility Hub
- University Library Support for Remote Teaching
- TA Guide for Remote Teaching via the MacPherson Institute
- CUPE 3906 Unit 1 Website

Academic Dishonesty

- Do not address students directly
- Bring any suspicion to the attention of the course instructor
- Academic Dishonesty is ultimately responsibility of the instructor

Health & Safety

- You have the right to refuse work if you have reasonable concerns
- The TA is responsible for knowing and following safety procedures
- TAs must know safety procedures and equipment
 - Location of emergency exits, fire extinguishers, emergency phones, first-aid kits, etc.
 - Fire alarm procedures
- Emergency phone numbers:
 - Calling from campus phone: 88
 - Calling from cell phone: **905-522-4135**

Limits to Confidentiality

While you should maintain confidentiality whenever possible, McMaster's Sexual Violence Response Protocol outlines instances in which you are obligated to break confidentiality:

- If someone is in immediate danger
- If you suspect the abuse of someone under the age of 16
- If the person causing harm is a McMaster employee

In these cases you should consult the Sexual Violence Response Coordinator. You are required to share the disclosure, but you should not share identifying information unless given permission to do so.

Harassment and Discrimination

- Online asynchronous anti-oppression training workshop (Equity and Inclusion Office) will cover topics relating to bias, discrimination, harassment, etc.
- Do not be afraid to report incidents
 - The university takes these issues seriously
- The Equity and Inclusion Office can help
 - Visit <http://equity.mcmaster.ca/> for more information

Addressing Conflict Using the ACTION Model

- **A**sk clarifying questions to help with understanding
- **C**ome from a place of curiosity rather than judgement and listen to their response
- **T**ell the student what you observed as problematic in a factual manner
- **I**mpact exploration and state the potential impact of such a comment on others
- **O**wn your own thoughts and feeling regarding the impact
- **N**ext steps – request that appropriate action be taken

Resources

- Student Wellness Center
 - 905-525-9140 x27700
- Campus Security
 - 905-525-9140 x24281; “88” from a campus phone in an emergency
- MacPherson Institute
 - 905-525-9140 x24540
- Environmental & Occupational Health Support Services (EOHSS)
 - <http://www.workingatmcmaster.ca/eohss/>
- Equity and Inclusion Office (EIO)
 - equity.mcmaster.ca
- Consultant on Sexual Violence Prevention and Response
 - svpro.mcmaster.ca/ and 905-525-9140 x20909
- Ombuds Office
 - <http://www.mcmaster.ca/ombuds/>
- McMaster Student Support and Case Management
 - <https://sscm.mcmaster.ca/>
- Privacy Office, in the University Secretariat
 - privacy@mcmaster.ca

Break

Grading

What is grading aside from assessment?

- Form of communication
- Shows student how they are doing
- Shows course instructor/TAs how students are doing
- Course instructor can adjust teaching material accordingly

Feedback

- Short explanations on assignments and exams
- Helps students understand their mistakes and identify successes in understanding
- Provides rationale for mark awarded



Quick tip: Save common feedback points to copy and paste when applicable to other students in order to save time on writing it out each time.

Consistency and Fairness in Grading

- Be consistent regardless of:
 - Your current situation
 - Your feelings about the course
 - Your feelings about a specific student
 - Messy vs. neat solutions
 - Electronic vs. Paper submissions
- Be open to review but stand by your marking scheme
- Speak with instructor regarding changing grades after posting

Grading Assignments vs Exams

Exams:

High stress, little time

- Worth more
- Messy
- Poorly structured answers
- Calculation errors

Assignments:

Ample time, lots of resources

- Worth less
- Neat
- Professional
- Double check answers

Grade according to expectations (i.e. the assessment being marked)

Grading Written Assessments

- Rubrics are used for consistency in grading lab reports, project reports, code documentation, presentations, etc.
- Create a rubric based on the purpose of the assessment
 - Rubrics should adequately reflect the expected learning outcomes from coursework
- A rubric defines a gradient between whether the purpose was achieved or not
- Marks should be proportionally weighted with greater allocation of marks to the most important area of the deliverable

Sample Grading Rubric

Conclusion		
4	2	0
Student shows understanding of the material presented in the lab	Student shows some understanding of the material presented in the lab	Student shows no understanding of lab material or report contains no conclusion

	1	Incomplete or unacceptable	2	Marginal	3	Accomplished	4	Excellent	Score
Title page, objective/procedure, references	Missing one or all components (title page objective references or procedural changes).		Title page and objective present but missing a component or procedural changes not noted or missing appropriate references.		All components present.		All components present and clearly organized in a professional manner any changes to procedure clearly explained. References cited.		/2
	Comments:								43

Sample Grading Rubric

Grade	Ideas	Organize	Support	Style	Mechanics	Comments
5	Excels in responding to each question of the assignment. Demonstrates thorough thought and understanding of concepts. Effort was used when answering questions.	Response to each of the outline questions and organized manner. Either by essay style or independent paragraph. Sophisticated transitional sentences are used to develop one idea to the next.	Provides evidence of a thorough literature review to provide excellent explanation of concepts and ideas. Sources are from reputable journals and textbooks etc.	Excellent choice of words uses appropriate language. Sentence style fits the audience and purpose. Sentences are structured and focused not long and rambling.	Entirely free of spelling, punctuation, and grammatical errors.	
4	Excels in responding to some of the questions of the assignment, other questions are not as thought through. Demonstrates thought and understanding of concepts. Effort was used when answering most questions.	Responds to each of the outline questions in a somewhat organized manner. Either by essay style or independent paragraph. Transitional sentence is are sometimes used to develop one idea to the next.	Provides evidence of a good literature review to provide sufficient explanation of concepts and ideas. Most sources are from reputable journals or textbooks etc., a few are from other resources.	Generally, use is a good choice of words; Uses appropriate language. Sentence is style fits the audience and purpose. Sentence is are for the most part structured and focused not long and rambling.	Contains a few errors (1-3)	
3	Effort in responding to some of the questions of the assignment, other questions are not as thought through. Demonstrates understanding of concepts. Some effort was used when answering most questions	Responds to most of the outlined questions in a somewhat organized manner. Either by essay style or independent paragraph. Transitional sentences are not used to develop one idea to the next.	Provides evidence of a few sources to make up a literature review to provide sufficient explanation of concepts and ideas period of few sources are from reputable journals or textbooks etc., many are from other sources.	Vague language used. May use some inappropriate language. Sentence style does not fit the audience and purpose. Sentences are for the most part poorly structured and not focused.	Contains a few errors (greater than 5).	
2	Minimum effort in responding to the questions of the assignment. Demonstrates understanding of some concepts. Some effort was used when answering most questions.	Responds to a few of the outline questions in a somewhat organized manner. Essay style, independent paragraph, some point form responses. Transitional sentences are not used to develop one idea to the next.	Provides little evidence of literature review to provide sufficient explanation of concepts or ideas. Most concepts are based on cliches or over generalized for support. Many sources not from reputable sources (ie. relying on Wikipedia).	Can contains a few awkward sentences, misuses words, employs inappropriate language.	Contains many errors causing confusion to the readers understanding.	
1	Does not respond to the assignment questions.	No organization answering the questions, everything is in point form.	Lack supporting evidence entirely.	Contains many awkward sentences, misuses words, employs inappropriate language.	Contain so many errors that it is impossible for the reader to follow.	

Faculty of Engineering Grading Philosophies

- **“The solution’s method is most important”**: McMaster default
- “A neat, well-prepared answer is most important”
- “The final result is most important”

Faculty of Engineering Grading Philosophies

- **“The solution’s method is most important”**: McMaster default
- The student gets a grade for relevant steps in the process and are only penalized once for miscalculations and errors in logic even if the errors impact later results

Faculty of Engineering Grading Philosophies

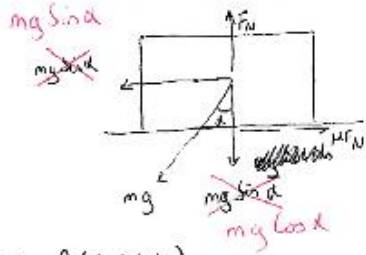
- **“Error-carried-forward”**: the idea that past mistakes should not affect subsequent calculations in a question
 - Only penalize subsequent unrelated errors; mark as if the error resulted in the correct answer for the remainder
- In most cases, ECF should be used to avoid double-counting errors

Grading Activity 1

Long Form Technical-Based Assessment

Assign each Midterm Question a mark out of 10

Question 1 – Answer 1



8/10

$$\text{Mass} = \rho V = \rho(L \cdot W \cdot H)$$

$$A_L: 10.8 \text{ kg} \quad [0.5]$$

$$S_t: 32.2 \text{ kg} \quad [0.5]$$

$$\text{Normal Force} = mg \sin \alpha \quad (-0.5)$$

$$A_L: 68.1 \text{ N} \quad [0.5]$$

$$S_t: 203.0 \text{ N} \quad [0.5]$$

$$\text{Static Friction} = \mu_s F_N$$

$$A_L: 51.68 \text{ N} \quad [0.5]$$

$$S_t: 91.37 \text{ N} \quad [0.5]$$

$$\text{Force Due to Gravity} = mg \cos \alpha \quad (-0.5)$$

$$A_L: 81.16 \text{ N} \quad [0.5]$$

$$S_t: 241.98 \text{ N} \quad [0.5]$$

Do they move?

$$\left. \begin{array}{l} A_L: 81.16 \text{ N} > 51.68 \text{ N} \\ S_t: 241.98 \text{ N} > 91.37 \text{ N} \end{array} \right\} \therefore \text{BOTH BLOCKS MOVE} \quad [1] [1]$$

$$\text{ACCELERATION FORCE} = mg \cos \alpha - \mu_s F_N$$

$$A_L: 40.3 \text{ N}$$

$$S_t: 181.0 \text{ N}$$

$$\text{ACCELERATION} = F/m$$

$$A_L: 3.73 \text{ m/s}^2 \quad [0.5]$$

$$S_t: 5.62 \text{ m/s}^2 \quad [0.5]$$

Time taken to reach end of incline

$$s = ut + \frac{1}{2}at^2$$

$$s = \frac{1}{2}at^2$$

$$t = \sqrt{\frac{2s}{a}}$$

$$A_L: 0.896 \text{ s} \quad [1]$$

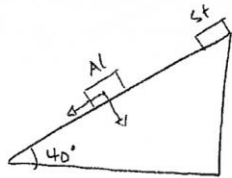
$$S_t: 1.03 \text{ s} \quad [1]$$

Do the blocks touch?

As the steel reaches the bottom first, in less time than the aluminium block it must touch it -1

- Early mistake in FBD, but rest of problem in completed correctly (i.e. the error is carried through)
- The conclusion is the same as the answer scheme, but wrong when the student's error is carried forward

Question 1 – Answer 2



(-0.5)

USED IMPERIAL
VALUE FOR GRAVITYA1

$$m = 0.1 \times 0.1 \times 0.4 \times 2700 = 10.8 \text{ kg}$$

[0.5]

$$N = mg \cos \alpha = 10.8 \times 32.2 \times \cos 40^\circ = 266.4 \text{ N } \times$$

$$F_s = 266.4 \times 0.75 = 199.8 \text{ N}$$

[0.5]

$$F_g = mg \sin \alpha = 10.8 \times 32.2 \times \sin 40^\circ = 223.5 \text{ N}$$

[0.5]

$$F_D = 266.4 \times 0.6 = 159.8 \text{ N}$$

[0.5]

$$a = (223.5 - 159.8) / 10.8 = 5.9 \text{ m/s}^2$$

[0.5]

7.5*
10

$$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2 \times 1.5}{5.9}} = 1.02 \text{ s } \times$$

[0]

S1

$$m = 0.1 \times 0.1 \times 0.4 \times 8050 = 32.2 \text{ kg}$$

[0.5]

$$N = 32.2 \times 32.2 \times \cos 40^\circ = 794.3 \text{ N } \times$$

* THE ANSWER
FOR THE TIME
DOES NOT MATCH
THE ACCELERATION
VALUES

$$F_s = 794.3 \times 0.45 = 357.4 \text{ N}$$

[0.5]

$$F_g = 32.2 \times 32.2 \times \sin 40^\circ = 666.5 \text{ N}$$

[0.5]

$$F_D = 794.3 \times 0.3 = 238.3 \text{ N}$$

[0.5]

$$a = (666.5 - 238.3) / 32.2 = 13.3 \text{ m/s}^2$$

[0.5]

$$t = \sqrt{\frac{2 \times 3}{13.3}} = 1.02 \text{ s } \times$$

[0]

$$F_g > F_s \text{ for both [1]}$$

$$\therefore \text{ they move. [1]}$$

$$t_{S1} < t_{A1}$$

$$\therefore \text{ the hit before}$$

$$\text{reaching the bottom. [1]}$$

- Accelerations are incorrect
- Times are correct (How?)

Question 1 - Answer 3

9/10

$$M = 0.2 \times 0.1 \times 0.4 \times 2700 = 10.8 \text{ kg} \quad [0.5]$$

$$F_D = \mu N = \mu (10.8)(9.81)(\cos 40^\circ)$$

$$= (0.75) \times (10.8)(9.81)(\cos 40^\circ)$$

$$\cancel{= 60.87 \text{ N}} = 60.87 \text{ N} \quad [0.5]$$

~~It moves!~~

$$F_D = \boxed{0.45} \times (10.8)(9.81)(\cos 40^\circ) \quad \text{WRONG COEFF} \quad \text{It moves!} \quad [1]$$

$$= 0.45 \times (10.8)(9.81)(\cos 40^\circ)$$

$$= 36.5 \text{ N} \quad [0]$$

$$F_g = (10.8)(9.81)(\sin 40^\circ) = 68.16766 \text{ N} \quad [0.5]$$

$$a = \frac{F_g - F_D}{m}$$

$$a = \frac{\cancel{F_g} - 36.5}{10.8} = \frac{(9.81 \sin 40^\circ) - 36.5/10.8}{1}$$

$$= 2.929 \text{ m/s}^2 \quad [0.5]$$

$$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2(1.5)}{2.929}} = 1.0135 \text{ s} \quad [1]$$

$$F_g = mg \sin \alpha$$

$$F_D = \mu N = \mu mg \cos \alpha$$

$$F_D = \mu mg \cos \alpha$$

$$\begin{aligned} F_g &= mg \sin \alpha \\ &= 32.2 \times 9.81 \times \sin 40^\circ \\ &= 20.36 \text{ N} \quad [0.5] \\ F_g &> F_D \therefore \text{It moves} \quad [1] \end{aligned}$$

$$m = 0.1 \times 0.1 \times 0.4 \times 2700 = 32.2 \text{ kg} \quad [0.5]$$

$$F_D = 32.2 \times 9.81 \times \cos 40^\circ \quad \boxed{0.6} \quad \text{WRONG COEFF} \quad [0]$$

$$= 195.1878 \text{ N} \quad [0]$$

$x_{st} > x_{pr} \quad [1]$

$$F_g = mg \sin \alpha$$

$$= 32.2 \times 9.81 \times \sin 40^\circ = 72.59 \text{ N} \quad [0.5]$$

$$F = ma$$

$$a = \frac{F}{m} = (F_g - F_D) / m$$

$$= g \sin \alpha - \mu g \cos \alpha$$

$$= 6.05 \text{ m/s}^2 \quad [0.5]$$

$$t = \sqrt{\frac{2s}{a}} = \sqrt{\frac{2(1.5)}{6.05}} = 1.206 \text{ s} \quad [1]$$

Grading 1

- Grading consistently
 - Grading schemes are our friend
- Mark the method, not the numbers
 - Difficult if students do not show work
- Give every piece of work a fair chance
- Academic dishonesty

Grading Activity 2

Short Form Technical-Based Assessment

Grading 2

[2 Marks] A 50 kg iron block at 80°C is dropped into an insulated tank that contains 0.5 m^3 of liquid water at 25°C . Determine the temperature when thermal equilibrium is reached

- You must assign each student a grade in only about 1 minute

Sample Student Submission

$$E_{in} - E_{out} = \Delta E_{internal} + \Delta E_{kinetic} + \Delta E_{potential}$$

The system is closed, so:

$$\Delta E_{kinetic} = 0, \Delta E_{potential} = 0, \Delta E_{out} = 0, \Delta E_{in} = 0$$

$$\Delta E_{internal,system} = \Delta E_{internal,iron} + \Delta E_{internal,water} = 0$$

$$[mc(T_2 - T_1)]_{iron} - [mc(T_2 - T_1)]_{water} = 0 \quad [0.5 \text{ mark}]$$

Assume:

$$\rho_{water} = 1000 \frac{kg}{m^3}, c_{water} = 4.18 \frac{kJ}{kg^\circ C}, c_{iron} = 0.45 \frac{kJ}{kg^\circ C}$$

So:

$$m_{water} = 0.5m^3 * 1000 \frac{kg}{m^3} = 500kg \quad [0.5 \text{ mark}]$$

and:

$$(50kg)(0.45 \frac{kJ}{kg^\circ C})(T_2 - 80^\circ C) + (500kg)(4.18 \frac{kJ}{kg^\circ C})(T_2 - 25^\circ C) = 0 \quad [0.5 \text{ mark}]$$

$$T_2 = 30.3^\circ C$$

$$E_{in} - E_{out} = \Delta E_{internal} + \Delta E_{kinetic} + \Delta E_{potential}$$

Closed system means change in energy is zero (i.e; internal energy of system remains constant)

$$\Delta E_{internal,system} = 0$$

Must solve for T_2 , assuming standard constants

$$\rho_{water} = 1000 \frac{kg}{m^3}, c_{water} = 4.18 \frac{kJ}{kg^\circ C}, c_{iron} = 0.45 \frac{kJ}{kg^\circ C}$$

So:

$$m_{water} = 0.5m^3 * 1000 \frac{kg}{m^3} = 500kg$$

and:

$$(50kg)(0.45 \frac{kJ}{kg^\circ C})(T_2 - 80^\circ C) + (500kg)(4.18 \frac{kJ}{kg^\circ C})(T_2 - 25^\circ C) = 0$$

$$T_2 = 25.6^\circ C$$

Grading Activity 3

Written-Based Assessment

Grading Activity 3

As part of your TA duties, you have been assigned 30 short-answer responses to mark. Your Hours of Work Form gives you an hour and a half to grade this assignment. This means that you have **3 minutes to spend marking each paragraph** (90 minutes / 30 assignments).

The question students were asked to answer is as follows:

“Explain what we can do as citizens to reduce the effects of global warming. Consider factors such as recycling, the impact of fossil fuels, and the impact of consumerism.”

- From the time we switch screens, you have **3 minutes to assign a mark out of 10**

Grading Activity 3

In the last years we are facing a really big problem called "Global Warming" because the humanity was not so carefull with the planet Earth. Global warming has many bad effect and it always an international environment problem that people want to solve. With the growing of earth population, global warming has become serious than ever. The citizens can reduce the effects of global warming if they recycle the material products like paper, glass, etc. If we will recycle the rubbish more than ever before we willl get a better future. I could do many things like recycling. At home I will separate the trash into many categories. For example, papers, bottles, and garbages. So many people do not recycle or through the rubbish in the nature. Papers could reuse after the process of paper factories. Bottles could reuse after the process of factories too. Most people become really comfortable and (they forget to use the bikes) not careful with the environment. They forget the oxygen is an important resource for life and they continue to cut the forests. We However, these things have an influence on us. When the oil get fewer, the price get higher. Customers might ot pay more on many things and some people might not afford it. We all need to be better friends to our world and nature. We should start to pay more attention to the Earth needs if we want to live in a safe-way. To sum up, helping reduce the effects of global warming is not only good for yourself but the every one and our home planet Earth.

Assign a grade out of 10

Grading Activity 3

More Information

“Explain what we can do as citizens to reduce the effects of global warming. Consider factors such as recycling, the impact of fossil fuels, and the impact of consumerism.”

- This is a sustainability course where content matters, but so does communication!
- Upon a discussion with the professor, you learn that they want:
 - 6 grade points for content (i.e., discussion on global warming, fossil fuels, consumerism)
 - 4 grade points for communication (i.e., spelling mistakes, clear sentences)
- From the time we switch screens, you have **3 minutes to assign a mark out of 10**

Grading Activity 3

In the last years we are facing a really big problem called "Global Warming" because the humanity was not so carefull with the planet Earth. Global warming has many bad effect and it always an international environment problem that people want to solve. With the growing of earth population, global warming has become serious than ever. The citizens can reduce the effects of global warming if they recycle the material products like paper, glass, etc. If we will recycle the rubbish more than ever before we willl get a better future. I could do many things like recycling. At home I will separate the trash into many categories. For example, papers, bottles, and garbages. So many people do not recycle or through the rubbish in the nature. Papers could reuse after the process of paper factories. Bottles could reuse after the process of factories too. Most people become really comfortable and (they forget to use the bikes) not careful with the environment. They forget the oxygen is an important resource for life and they continue to cut the forests. We However, these things have an influence on us. When the oil get fewer, the price get higher. Customers might ot pay more on many things and some people might not afford it. We all need to be better friends to our world and nature. We should start to pay more attention to the Earth needs if we want to live in a safe-way. To sum up, helping reduce the effects of global warming is not only good for yourself but the every one and our home planet Earth.

Assign a grade

Content:

6

Communication:

4

Grading Activity 3 – Bad Feedback

In the last years we are facing a really big problem called “Global Warming” because the humanity was not so carefull with the planet Earth. Global warming has many bad effect and it always an international environment problem that people want to solve. With the growing of earth population, global warming has become serious than ever. The citizens can reduce the effects of global warming if they recycle the material products like paper, glass, etc. If we will recycle the rubbish more than ever before we will get a better future. I could do many things like recycling. At home I will separate the trash into many categories. For example, papers, bottles, and garbages. So many people do not recycle or through the rubbish in the nature. Papers could reuse after the process of paper factories. Bottles could reuse after the process of factories too. Most people become really comfortable and (they forget to use the bikes) not careful with the environment. They forget the oxygen is an important resource for like and they continue to cut the forests. We However, these things have an influence on us. When the oil get fewer, the price get higher. Customers might ot pay more on many things and some people might not afford it. We all need to be better friends to our world and nature. We should start to pay more attention to the Earth needs if we want to live in a safe-way. To sum up, helping reduce the effects of global warming is not only good for yourself but the every one and out home planet earth

Assign a grade

Content: 4/6

Communication: 1/4 OK✓

*Student response adapted from MacPherson Institute

Grading Activity 3 – Good Feedback

In the last years we are facing a really big problem called “Global Warming” because the humanity was not so careful with the planet Earth. Global warming has many bad effects and it always an international environment problem that people want to solve. With the growing of earth population, global warming has become serious than ever. The citizens can reduce the effects of global warming if they recycle the material products like paper, glass, etc. If we will recycle the rubbish more than ever before we will get a better future. I could do many things like recycling. At home I will separate the trash into many categories. For example, papers, bottles, and garbages. So many people do not recycle or through the rubbish in the nature. Papers could reuse after the process of paper factories. Bottles could reuse after the process of factories too. Most people become really comfortable and (they forget to use the bikes) not careful with the environment. They forget the oxygen is an important resource for like and they continue to cut the forests. We However, these things have an influence on us. When the oil get fewer, the price get higher. Customers might not pay more on many things and some people might not afford it. We all need to be better friends to our world and nature. We should start to pay more attention to the Earth needs if we want to live in a safe-way. To sum up, helping reduce the effects of global warming is not only good for yourself but the every one and out home planet earth

Assign a grade

Content: 4/6

Communication: 1/4

- Lots of spelling and grammar errors.
- Good discussion on Global warming.

Grading Activity 3 – Best Feedback

In the last years we are facing a really big problem called "Global Warming" because the humanity was not so careful with the planet Earth. Global warming has many bad effects and it always an international environment problem that people want to solve. With the growing of earth population, global warming has become more serious than ever. The citizens can reduce the effects of global warming if they recycle the material products like paper, glass, etc. If we will recycle the rubbish more than ever before we will get a better future. I could do many things like recycling. At home, I will separate the trash into many categories. For example, papers, bottles, and garbages. So many people do not recycle or through the rubbish in the nature. Papers could reuse after the process of paper factories. Bottles could reuse after the process of factories too. Most people become really comfortable and (they forget to use the bikes) not careful with the environment. They forget the oxygen is an important resource for like and they continue to cut the forests. We However, these things have an influence on us. When the oil get fewer, the price get higher. Customers might not pay more on many things and some people might not afford it. We all need to be better friends to our world and nature. We should start to pay more attention to the Earth's needs if we want to live in a safe way. To sum up, helping reduce the effects of global warming is not only good for yourself but the every one and out home planet earth

Assign a grade

Content:

4/6

Communication:

1/4

Good discussion on Global warming. Effects of fossil fuels and consumerism could have been expanded on. Lots of spelling and grammar errors.

Grading 3

- Always be clear on the intended learning outcomes, this will guide your rubric
- Be consistent with grading time (i.e., try not to spend 2 min on one student, but 15 min on another)

Teaching

Introduction to Teaching

- *What is the difference between a lecture, tutorial and a lab?*
 - Lecture: Heavily theory based, minimal interaction
 - Tutorial: Problem based, lots of interaction, application of theory
 - Lab: Real world application based, high student involvement, hands on

Teaching Roles and Functions

- Possible roles
 - Review material
 - Perform experiments
 - Review assignment/homework question
 - Introduce and/or reinforce course content
- Facilitate a discussion and get the students thinking critically
- Varying levels of knowledge

Preparing for First Lesson

Prepare a tutorial handout

- Physical or electronic
- Define your expectations
- Attendance and participation
- Your office number, office hours, and email address
- Your email policy

Learning Environment

- You set the tone
- Civil and inclusive classroom
 - It's okay for students to say "I don't know"
- Identify and discourage bad behaviour
- Please reference [McMaster's Code of Student Rights and Responsibilities.](#)
- Learn about student mental health and how to support students
 - [Professor Hippo-on-Campus Mental Health Education Program - Mental Health at McMaster](#)

Keeping Students Engaged/ Focused

- Visually survey the room and speak clearly
- Student's attention span is limited to 15-20 minutes
 - Consider changing the format to keep things interesting
- Ask the students questions
 - Open-ended questions vs. closed-ended questions:
'How did you arrive at a solution to this problem' instead of 'What answer did you get for this problem'
 - Survey questions: get students to raise their hand (low commitment engagement)
 - Probing questions: e.g. If I raise the temperature what happens to c_p ?

Lesson Plans

- Not a script, but an outline for you to follow
- Helps keep time
- Helps you present material in a logical and easy to understand manner
- Format
 - Bridge
 - Outcome(s)
 - Pre-Assessment
 - Participatory Learning
 - Post-Assessment
 - Summary

Lesson Plans

- This format is useful for not just “lessons”: seminars, explaining a lab, answering questions, etc.
- MacPherson institute has many more guidelines for developing lesson plans:
 - Inquiry based learning techniques
- Instructional skills workshops

Lesson Plans: Bridge

5-10% of time

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

Lesson Plans: Intended Learning Outcomes/Objectives

~1 minute

- Introduce the purpose/objective of the tutorial
 - Each objective should be one sentence statement
- What students will know/be able to do by the end of tutorial
 - “By the end of this lesson, you should be able to...”

Lesson Plans: Pre-Assessment

~10-20% of time

- Helps TA understand the current level of understanding
- 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

Lesson Plans: Participatory Learning

~60-70% of time

- Keep your original objective in mind
- Check for understanding
 - ask questions throughout and try not to continuously talk
 - have the students work in pairs to solve sample problems
- Tip: Before solving problems with students, write notes and questions on the solution to ask students

Lesson Plans: Post-Assessment

5%-10% of time

- Provide opportunity for questions from the students
- Check the students' understanding
 - Open-ended questions
 - Polls/iClicker/TopHat/etc. can be useful for larger groups

Lesson Plans: Summary

< 5% of time

- Conclusion to lesson
- Review and reflect on material covered

Lesson Plans: Self-Assessment

- Perform immediately after tutorial/lab
- 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?

Note: McMaster conducts course evaluations containing feedback from students. If you want to be included, you need to ask your professor

Thank you

Please complete the quiz and fill out the evaluation!

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