

Instructor Training Courses

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University of Waterloo

Some staggering numbers (in 2019):

- 36500 total students
- 31000 undergraduates
- Faculty of mathematics with its 5+1 departments (Applied mathematics, C&O, CS, Pure Mathematics, Stats and Actsci, Dean of Mathematics)
- 7216 undergraduate students (5275 co-op and 1941 non co-op students)
- 815 Graduate students
- <https://uwaterloo.ca/institutional-analysis-planning/university-data-and-statistics/student-data/student-headcounts>
- Students across the university teaching 1A calculus totalled over 4600 students (!)
- All math majors must take 1 CS, 1 Calculus and 1 Algebra in terms 1A and 1B.

A Three-Tier Model

- Tier 1 comprises of the introduction at the beginning of the term where we go over in more depth discussions on how to grade, responsibilities for proctoring, discussions on how to help in tutorials, and so on.
- Tier 2 (in production) comprises of how to give a tutorial session. We [would] discuss presentation skills, dealing with student questions, and aspects of active learning.
- Tier 3 (the focus of this talk) a term long [seminar] course to help prepare student teachers.

Key components to Tier 3

Ran for the first time in Winter 2018 (roughly 12 regular participants). Once a week 1.5 hour seminar.

- Presentation skills (Weeks 1, 2)
- Three micro teaching sessions (Weeks 3, 6, 9)
- Creating Assessments (Weeks 4, 5)
- Visiting a lecture (Weeks 7, 8)
- In class practicum (Week 10)
- Scenarios week and Graduate Panel [Formerly: Guest Lecture - Teaching Philosophies] (Week 11)
- “How to get a Job” (Week 12)

No formal credit given to the students [or instructors!].

Key components to Tier 3

In this session we will demonstrate two of the aforementioned weeks - One from Scenario's Week and one from Presentation Skills.

Scenario's Week

Get into groups of size n where $3 \leq n \leq 4$ (Normally I would count-off but I'm hoping you can manage on your own!)

Instructions: For each scenario work with your group to answer these two questions:

- Suppose this scenario happened to you. What would you do?
- What could be done to prevent this happening in a future course?

Scenario's Week

1. The class has a failing average on your midterm. Students want you to adjust the grades but you believe the midterm exam was fair.
2. One hour into your final exam, the fire alarm was pulled. students were forced to evacuate and by the time the problem was resolved, the exam period was over.
3. A student misses an exam on Tuesday. On Wednesday they come to your office appearing well. Their Doctor's Note states that they are severely incapacitated from Monday - Friday of this week.
4. A student oversleeps and arrives 1 hour late for the final exam. They write the exam but their grade in the course is much lower than their normally high performance. They are very upset and ask you to adjust their grade.

Final Comments

- Counting off students gives better variety
- Can run as a “cake walk” exercise.
- Can/should modify as appropriate at your institution (Re: CoMInDs [College Mathematics Instructor Development Source]).
- Other potential topics: Missing exams, inconsistent marking on assignment/final, students complaining about workload, etc.

Active Learning

Traditional university classrooms revolve around lecturing. In the 1600's this made sense. Now it isn't as clear that this is the best way to disseminate knowledge.

What other activities can we do in a classroom?

What Makes Good Lecturing

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Does it even necessarily involve lecturing?

Wason Selection Task

Statement: If a card has a vowel on one side, it has an even number on the other.



Given that each card has a letter on one side and a number on the other side, which card(s) do you **have** to turn over to verify the above statement?

Ensuing Discussion

- <https://bookwalk.app.box.com/v/F0McaseLoResVideo110311>
- Previous is from:
<http://collegemathvideocases.org/cases/case.php?VCID=8>

A Twist: A Beer Puzzle

Four friends, Alice, Bob, Eve and Oscar go to a pub. In Ontario, the following is true:

If you are drinking alcohol then you must be over 19

The server knows the following information:

- Alice is 21
- Bob is having a juice
- Eve is drinking beer
- Oscar is 18

Who must the server talk to about their other piece of information in order to determine if they are ordering legally?

A Final Plug

Website for resources for graduate training programs

<http://cominds.maa.org/>

Sample videos of teaching:

- <https://www.youtube.com/watch?v=GtP6CUEHDhY&feature=youtu.be&t=1035>
- <https://www.youtube.com/watch?v=9621LfW-8Jo&feature=youtu.be>

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