

Teaching Dossier

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Teaching Philosophy

In considering my teaching philosophy, it seems most natural to first examine my ideas about teaching, and then follow up with how I implement those ideas in the classroom and where I hope they will lead.

Statement of Teaching Philosophy

I believe all professors have an obligation to teach their students more than just the content of the course, but in engineering this is especially crucial, as students may go on to work on projects with a public safety element. With this in mind, my goal in teaching students is threefold:

1. Teach them fundamental concepts.
2. Teach them how to use the fundamental concepts.
3. Teach them how to discover what they don't already know.

While these statements may seem to match the goal of any generic university education, my approach to teaching tries to engage with them in a very specific way.

The notion of teaching students fundamental concepts underlies many university courses, but I am not so interested in teaching students facts to be regurgitated, but rather the ideas they can use to do greater things. Information can be looked up; knowing what you have to look up is key. The fundamental concepts themselves, whether in Computer Engineering or Political Science, are only useful insofar as they can be applied, and that is where teaching gets interesting.

Teaching students to use the information available to them is a challenge, but one that I relish. I see my role as a teacher primarily as one in which I show students how to use the knowledge they have at hand to analyze and solve problems. Often these problems can be rigidly defined and mathematical, but just as often they can be open-ended, and helping students through the problem-solving process is crucial in such cases.

The last element of teaching is giving students the confidence and ability to discover new things on their own, whether through original research in a lab, or a literature review in a library. Teaching students to teach themselves is a vital part of education, and one that must be handled explicitly by the teacher.

Teaching Strategies and Practice

The key to helping students retain information and understand how to use it is to get them actively involved in learning. Engineering is a difficult discipline to have discussions in, and so much of the active learning typically falls outside of class time, as when I taught a

course on Discrete-Time Systems and Signals (see a mirror of the course website at <http://www.eecg.toronto.edu/~ahouse/mirror/engi7824/>).

This works reasonably well, but since then, I have been working on discovering and developing techniques to integrate active learning into lectures as well. These techniques range from class problem-solving where I solicit the next step in solving an example from students, to partner exercises mid-class where students work with a neighbour to find an answer, to class presentations.

The key is to get them actively involved in the lectures, appealing to different learning styles, and reinforcing that with homework and formative assessments. I try to teach my students the process, not the answer.

Teaching Goals and Aspirations

While I have extensive experience as a teaching assistant, my experience as a lecturer and course instructor is rather less. I look forward to gaining more experience, especially with courses more directly in my area of expertise, where my enthusiasm and background knowledge can really shine through.

My previous experience as a teacher has been mostly positive, but there were elements of my teaching that I want to improve, such as my handling of student questions in lectures and tutorials. I have also struggled to find my personal “voice” as a teacher, but after all the recent training I’ve had, I believe I have found it. I am mostly looking forward to new opportunities to teach, in which I have the control to try the methods that are best suited to me.

Professional Development

I always enjoy refining my teaching skills; no matter how good a teacher you are, there is always something more to learn. Consequently, I am always eager to participate in professional development when it comes to teaching. Not only does it give me the opportunity to learn more about teaching, but it also forces me to think about my own teaching, and how it could be better.

I have already availed of such professional development, in the form of Memorial University’s Graduate Program in Teaching (GPT), the University of Toronto’s Teaching Assistants’ Training Program, and the Prospective Professors in Training program. I have learned much from these programs, but I am also keenly aware that there is much more to know, and so I intend to continue my professional development as a teacher whenever I get the opportunity.

Highlights of Teaching Experience

In this section, I give details on some highlights of my teaching experience. A more thorough accounting can be found in my curriculum vitae, as I have extensive TA experience.

University of Toronto

Fall 2008: Head Teaching Assistant

Course:	ECE 253: Digital and Computer Systems, Division of Engineering Science
Description:	A required second-year course introducing digital hardware design and computer organization concepts, with a strong lab component.
Enrollment:	160, with 25–30 per lab
Frequency:	5 hours per week
Responsibilities:	<ul style="list-style-type: none">• Organized and allocated 12 other teaching assistants.• Maintained course website, held office hours.• Tracked and entered student grades.• Conducted labs and assessed student performance.• Marked mid-term and final exams.

Winter 2005–2009: Senior Teaching Assistant

Course:	ECE 243: Computer Organization, Department of Electrical and Computer Engineering
Description:	A second-year course for computer and electrical engineers, introducing and computer organization and assembly programming concepts, with a strong lab component.
Enrollment:	Approximately 300, with 40–50 per lab
Frequency:	7 hours per week (most recent)
Responsibilities:	<ul style="list-style-type: none">• For the last few years, I have been the senior TA in my lab room, providing a degree of help and guidance to more junior TAs in addition to my regular responsibilities.• Developed some instructional materials.• Conducted two sets of labs and assessed student performance.• Marked mid-term and final exams.• Supervised and assessed student projects.

Memorial University of Newfoundland

Summer 2004: Course Instructor

- Course:** ENGI 7824: Discrete-Time Systems and Signals, Faculty of Engineering and Applied Science
- Description:** An upper-year course extending a previous course on continuous-time signals and systems, introducing elements and techniques for signal processing.
- Enrollment:** 45 students
- Frequency:** 4 hours per week
- Responsibilities:**
- Taught all lectures (twice weekly) and tutorials (one per week).
 - Set assignments and developed solutions for TA.
 - Set and assessed quizzes, exams, and a term paper.
 - Developed new course notes from existing material.

Fall 2003: Head Teaching Assistant

- Course:** ENGI 3861: Digital Logic, Faculty of Engineering and Applied Science
- Description:** An introductory course in digital logic and hardware design, with a strong lab component.
- Enrollment:** Approximately 40–50 students, half in each lab
- Frequency:** 8 hours per week
- Responsibilities:**
- Supervised all lab sessions.
 - Organized other TAs.
 - Taught and developed course notes for several lectures.
 - Conducted labs and an extra tutorial.
 - Assessed student performance in labs and on assignments and quizzes.

Teaching Evaluations

My most recent teaching experience has been as a Teaching Assistant in Electrical and Computer Engineering at the University of Toronto. These teaching assistantships have been for lab courses, typically with many other teaching assistants working on the same course and in the same lab room, and with no facility for ascertaining student evaluations. Consequently, my most recent experience has only been evaluated anecdotally.

That said, as part of my professional development, I have recently undertaken several microteaching sessions (two as part of the TATP's AOTP Certificate program, and one as part of the *MIE3002: Engineering Teaching and Learning* course). Numerical summaries of the TATP sessions are included.

My earlier experience in the Faculty of Engineering and Applied Science at Memorial University of Newfoundland was able to provide a greater degree of feedback due to smaller class and lab sizes, as well as the opportunity to be a Course Instructor. During this time, I also received several letters of evaluation and commendation.

In the following subsections, I break down the different types of experience and evaluation I have received to allow for greater readability.

Evaluation as Course Instructor

From May to August 2004, I was given the opportunity to be the Course Instructor for the senior undergraduate course *ENGI 7824: Discrete-Time Systems and Signals* while I completed my Masters degree. This was challenging in a number of ways: my first full teaching experience, while finishing my experiments and writing my thesis, in a subject area that was not my specialty, and in a course I did not even do especially well in as an undergraduate. I was responsible for giving lectures and tutorials, setting assignments and exams, and marking the exams and term paper.

Overall, the experience was a good one. The most common negative comments were twofold: I sometimes had difficulty effectively answering student questions, and I could have been better prepared for the tutorial sessions. These were problems I recognized myself, as well, and that I worked toward correcting.

Part of the difficulty with answering questions was my lack of expertise with the subject; this would hopefully not be an issue in courses more in line with my other teaching and research experience. By the end of the course, I think I had improved my preparedness for tutorials, but that is also something to watch for in the future.

The most common positive comment was appreciation of the course notes I made available, an example of which can be found in the mirror of the course website at <http://www.eecg.toronto.edu/~ahouse/mirror/engi7824/>.

The table below summarizes the results of the teaching evaluations for the course, with 26 of the 45 enrolled students responding. Questions 1–7 were ranked from 1 (Strongly Disagree)

to 5 (Strongly Agree); question 8 was ranked from 1 (Poor) to 5 (Excellent). The “Course Mean” column refers to the course I taught; the “All Courses Mean” is for all courses offered to that cohort in that semester, based on 127 responses.

	Course Mean	All Courses Mean
Q1. The student requirements in the course were clear.	4.24	4.0893
Q2. The instructor responded to the students’ questions effectively.	3.54	4.0270
Q3. The instructor showed concern for how well students progressed in the course.	4.19	3.9590
Q4. The instructor stimulated my interest in learning the subject matter of the course.	3.31	3.6598
Q5. Students were given constructive feedback on written work, i.e., assignments and exams.	4.04	3.8337
Q6. Overall the course was well organized.	4.12	3.9883
Q7. I would recommend this course taught by this instructor to another student with interests and preparation similar to my own even if it was not required.	3.62	3.7217
Q8. Overall the quality of instruction was:	3.88	3.8875

Evaluation of Microteaching

For my first microteaching session, I lectured using the blackboard and taught a very introductory topic. For the second session, I chose to experiment with using PowerPoint slides and working with a more advanced topic that was a poor match to my audience’s background. The numbers suffered a bit, as a result, but overall remained quite good. The numbers range from 1 (unacceptable) to 7 (outstanding), and each session provided evaluations from 5 peers.

	Microteaching I	Microteaching II
Lesson Organization		
1. introduction (prior knowledge; overview)	6.9	4.6
2. clarity of learning objectives	6.2	5
3. lesson well-paced	6.6	6
4. effective use of summary (planned repetition of key points)	5.8	5.8
5. effective transitions (logical progression of concepts)	6.2	5.8
6. effective use of time	6.2	6.4
7. conclusions and review	6.25	6.4
Presentation Skills		
1. rhythm and speed of speech	6.8	5.8
2. voice modulation and articulation	6.8	5.4
3. showed enthusiasm	6.4	5.2
4. effective use of gestures	6	5.6
5. explanations were clear	7	6.2
6. used good examples to clarify points	6.8	5.8
7. emphasized important points	6.6	5.7
Relating to the Student		
1. audience-appropriate language and level of material	6.6	4.8
2. effective asking and answering of questions	6.2	5.4
3. encouraging group discussion and interaction	5.6	3.75
4. use of real-life examples	6.4	5.8
Supporting Materials/Teaching Aids		
1. handouts pertinent and easy to follow	N/A	N/A
2. value of supporting materials clearly explained	N/A	5.5
3. visual aids used effectively (overhead, Power-Point, video recording, etc.)	6	6
4. diagrams/equations/exercises on board written clearly	7	6.5
Overall Impression	6.4	5.6

Evaluation as Teaching Assistant

Unfortunately, there has been little opportunity for direct student evaluation of my effectiveness as a teaching assistant. There has been some indirect feedback, however.

Since coming to the University of Toronto, perhaps the best indicator of my performance is that I have been continually rehired to TA the same courses, usually with an increased number of hours (90 or 120 compared to the normal 60). I have also been given increased responsibility as my experience has grown, to the point where I have been the senior TA in a lab room and helped develop instructional materials, and served as head TA.

While at Memorial University, my performance as a TA from the final five courses in which I held a teaching assistantship was rated as excellent by their respective professors. Scanned copies of sample letters to this effect are available to potential employers.

Furthermore, during Fall 2003, while I was doing the Graduate Program in Teaching and serving as the Head TA for *ENGI 3861: Digital Logic*, the class representative volunteered to write a letter on behalf the of the class thanking me for my work. (Some of this work can be seen on a mirror of the course website at <http://www.eecg.toronto.edu/~ahouse/mirror/engi3861/>.) It was co-signed by a large portion of the class and given to me when the semester was over, after all of my marking responsibilities were complete. A scanned copy of the letter is available to potential employers.

Evaluation from Faculty

During Fall 2003, I was enrolled in Memorial University of Newfoundland's Graduate Program in Teaching (as mentioned above). This included evaluation by faculty, such as my teaching supervisor, Dr. Ramachandran Venkatesan, and the coordinator of the GPT, Dr. Jean Guthrie. This resulted in two letters of reference, scanned copies of which are available to potential employers.