Teaching Statement - Richard Yamada

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Teaching Experience

As a graduate student at Cornell University and as term assistant professor at the University of Michigan, I have taught courses in both computer science and mathematics. The following paragraphs briefly summarize my teaching experience to date.

- **Cornell University:** As a teaching assistant, I taught introductory computer science recitation sections (2 during the Fall of 2006, and 3 during the Spring of 2007) for freshmen and sophomores. As a course instructor for the computer science department, I taught 2 4-week short courses (12 lectures each) for the computer science department. The first short course, which I taught during the fall of 2006, was entitled *Introduction to Linux Tools*; the second short course, which I taught in the spring of 2006 and 2007, was entitled *Advanced Tools in Linux*. In both courses, I developed all the lecture materials, project assignments, solutions, and exams. My teaching was recognized by the Department of Computer Science when I was awarded an *Outstanding Teaching Assistant Award* during the spring semester of 2007.

- **University of Michigan:** As a term assistant professor, I have taught: 1) freshmen calculus (Fall 2007), 2) an upper level course (undergraduate/graduate) in numerical analysis (Winter, Summer, Fall 2008), 3) an upper level course in advanced engineering mathematics (Summer 2009), 4) an upper level course in mathematical biology (Fall 2009), 5) an upper level course in mathematical modeling (Winter 2010) 6) an upper level course in partial differential equations (Spring 2010). For each of these courses, I was responsible for creating the syllabus, homework assignments, exams, and laboratory exercises. I also developed supplemental lecture notes and in-class worksheets.

Teaching Style and Philosophy

**General Philosophy:** As a teacher, I always keep my students’ best interest first, which is to see my student’s succeed in learning and understanding the course material. I want my students to *aim high* and set high expectations for themselves. I measure my teaching success on how well my students retain their knowledge and maintain their enthusiasm for the course; when students exceed their own expectations, I consider my teaching a success.

**Meeting Student Goals:** In order to see my student’s succeed, I believe it is important to understand my students’ motivation for taking my course. During the first lecture, I distribute a short anonymous survey; the survey briefly asks the students what they would like to get out of the course, and how the course will help them with their future (short or long term) plans. Responses have included everything from getting a superior grade to using the material in their current research. Twice a semester (usually before each midterm), I hand out another anonymous brief survey (I share the results with the class) in which I ask the class about the pace of the course, effectiveness of the lectures, the difficulty of the assignments, and if there are any topics they would like me to review again. These surveys help me determine how well I am meeting my student’s best
interests, and where I need to improve in order to best meet their needs.

**Lecture Style:** When lecturing, I try to emphasize *one* key concept; I then do a theme and variations illustrating this concept. Throughout my lecture, I frequently stop and encourage questions, because it facilitates classroom participation and creates an opportunity to engage everyone in better understanding the material. I carefully choose my examples in order to convince students of the need or motivation for the more abstract concepts that will be introduced in later lectures. Also, I feel that students learn best from simple examples; once they have learned and mastered these examples, I introduce more difficult problems for the homework assignments. These homework assignments build on the material from the lectures, creating a smooth segueway to continue thinking about the material discussed in class. Thus, the assignments are not simply rote application of the lectures and notes, but require additional *critical and creative thinking*. In my more advanced courses, I introduce problems which incorporate material from current research or contemporary issues, giving my students an idea of the application of the course topics. By employing a challenging and *layered* approach to the homework, the student gains a deeper understanding/appreciation of the material, and allows him/her to ask more focused questions during subsequent lectures.

I typically arrive to class 5-10 minutes before lecture, in order to encourage students to ask any questions before the start of lecture. I have learned that students look forward to this time, since it is an informal time for them to ask questions about any concepts they were confused about from the previous lecture. By being available both before and after class, I strive to create an environment where students feel welcome to ask questions arising from their own curiosity or to ask questions arising from the assigned reading.

**Development of Supplemental Course Materials:** I also enjoy creating supplemental materials for each of my courses. For example, in my numerical analysis courses, I developed MATLAB computer labs which allow the students to not only complement their course knowledge but also work on their programming skills. I design each lab assignment so that the exercises gradually increase in difficulty; completion of the lab exercises also gives the students the confidence to solve specific problems on their homework assignments. Other supplemental material that I have developed are worksheets which decompose a non-trivial problem into a series of smaller questions. These worksheets, which are completed during lecture, allow students to be more engaged in the material and allow them to participate in further discussions.

**Office Hours:** I encourage my students to carefully think about the questions they raise, without myself directly providing them the solutions. I have found this *active* approach effective, since it helps students understand exactly what they are confused about or where they lack understanding. During office hours, whenever a student asks a question about how to solve a particular homework problem, I always ask the student to first re-explain the problem to me in their own words, and then sketch out their plan to solve the problem. Furthermore, I always encourage students to work in this manner when completing homework assignments or studying for exams. When appropriate, I challenge the students to sharpen their mathematical intuition and creativity in solving a problem. I also use office hours to quiz the students on their understanding of basic concepts covered in class.
Student Ratings and Comments

At the end of each semester, the quality of my teaching is anonymously evaluated, using the University of Michigan evaluation system, by students who enrolled in my course. These students not only give me a numerical rating, but they also provide comments on my teaching effectiveness. I have included these numbers (5 is highest, 1 is lowest) and comments below.

<table>
<thead>
<tr>
<th>Semester/Year</th>
<th>Course Number &amp; Title</th>
<th>Eval/Enrolled</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 07</td>
<td>Math 115: Calculus I</td>
<td>31/31</td>
<td>4.27</td>
<td>4.14</td>
<td>4.59</td>
<td>4.80</td>
<td>4.12</td>
</tr>
<tr>
<td>Winter 08</td>
<td>Math 471: Numerical Analysis</td>
<td>23/23</td>
<td>4.78</td>
<td>4.82</td>
<td>4.73</td>
<td>4.86</td>
<td>4.73</td>
</tr>
<tr>
<td>Summer 08</td>
<td>Math 471: Numerical Analysis</td>
<td>14/14</td>
<td>4.86</td>
<td>4.86</td>
<td>4.92</td>
<td>4.96</td>
<td>4.86</td>
</tr>
<tr>
<td>Summer 09</td>
<td>Math 450: Advanced Engineering Mathematics</td>
<td>11/12</td>
<td>4.71</td>
<td>4.89</td>
<td>4.71</td>
<td>4.95</td>
<td>4.81</td>
</tr>
<tr>
<td>Fall 09</td>
<td>Math 463: Mathematical Biology</td>
<td>22/22</td>
<td>4.39</td>
<td>4.65</td>
<td>4.23</td>
<td>4.77</td>
<td>4.30</td>
</tr>
<tr>
<td>Winter 10</td>
<td>Math 462: Mathematical Modeling</td>
<td>16/16</td>
<td>4.17</td>
<td>4.61</td>
<td>4.17</td>
<td>4.88</td>
<td>4.17</td>
</tr>
<tr>
<td>Spring 10</td>
<td>Math 454: Boundary Value Problems for PDEs</td>
<td>18/22</td>
<td>4.75</td>
<td>4.68</td>
<td>4.60</td>
<td>4.75</td>
<td>4.68</td>
</tr>
</tbody>
</table>

Q1: Overall, the instructor was an excellent teacher.
Q2: The instructor handles questions well.
Q3: The instructor used class time well.
Q4: The instructor was concerned that we learn.
Q5: The instructor presented material clearly in lectures.

The following are a sampling of student comments (unedited):

"Richard was very helpful and accommodating responding to emails as soon as possible, offering extra office hours and individual meetings if needed. Was very respectful to students, understanding of questions, and was very concerned that students learned the material. Offered solutions to past quizzes and used class time to help students understand the material."
Student from Math 115

"The instructor provides notes which are very helpful and clear up any class questions. He is the best math professor I have ever had." Student from Math 371

"Dr. Yamada is an excellent lecturer. Enough said!" Student from Math 450

"Overall I liked Prof. Yamada's teaching style. I was impressed that despite his busy schedule he was always willing to meet with students and answer their questions. This class is one of the hardest classes I took at Michigan, but I'm glad I took this class"
Student from Math 471

"We need more classes like these especially for us as Mathematical biology majors! Having the project aspect of the course significantly deepened my understanding and solidified my desire to be in this field." Student from Math 463
"Prof. Yamada is a very nice guy. He is very approachable and I feel comfortable asking him questions during office hours. He also teaches clearly and makes the subject matter interesting." Student from Math 471

"Dr. Yamada is one of the best instructors I have had in the math department. He presented the material in a very approachable manner, and he was very helpful in getting me reoriented with math after a year of not taking math courses. I really enjoyed the class and I hope more students can get a chance to take Math 463 with Dr. Yamada." Student from Math 463

"Prof. Yamada spent a lot of time explaining concepts in this course and making them clear. He was well prepared and spent class time well. His friendly and encouraging demeanor makes his otherwise difficult course worthwhile. He may consider lightening the course workload. Overall this class was a lot of work but challenging and worthwhile." Student from Math 471

"Best instructor I’ve ever had for a math/calculus course so far at UM.” Student from Math 454

Research Supervision

I have been fortunate to work with several talented undergraduate students through the Undergraduate Research Opportunities Program (UROP) and the Summer Research Experience for Undergraduates (REU) Program; both programs are sponsored by the University of Michigan. In addition, I have supervised student research through Math 499, independent study. I enjoy mentoring students, and find this activity very rewarding. Below is a complete list of my students who have pursued research with me.

**Alban Xhaferllari** (UROP): 2008-2009
**David Yang** (UROP and REU): 2008-200
**Tyler Bridge Johnson** (UROP and REU): 2008-2009
**Garrett Swaney** (UROP): 2009-2010
**Lars Johnson** (UROP): 2009-2010
**Lisa Kalenkiewicz** (Math 499): Winter Term, 2010
**Kara Fulton** (Math 499 and REU): 2010
**Liz Kennedy** (Math 499): Winter Term, 2010
**Kara Vogel** (Math 499): Spring/Summer 2010

Future Teaching

I take great pride and responsibility in teaching mathematics to the next generation of engineers, mathematicians, and scientists. I enthusiastically welcome the opportunity to teach introductory mathematics courses, including calculus, differential equations, and linear algebra. Furthermore, I am confident in teaching any advanced undergraduate mathematics course. Because of my commitment to excellence in teaching, I will continue to be an effective instructor in the classroom, whatever course I am assigned. I would also be delighted to teach specific courses in mathematical biology, which is my research speciality; specifically, I would be interested in the formation and development of any courses in an undergraduate/graduate mathematical biology program. Finally, I welcome the opportunity and responsibility of supervising and teaching graduate students in my research area. I eagerly look forward to the rewarding experience of teaching and mentoring students in your mathematics department!