Teaching Statement

Michael D. Adams

I greatly enjoy helping others discover and explore the beauties and wonders of the intellectual landscape. In fact, in my last two years as a graduate student I chose appointments that focused on teaching instead of research in order to gain practice and experience at doing so. I also requested courses early in the undergraduate curriculum as they are unique opportunities to introduce students to the beauties of computer science.

At Indiana University, I was an associate instructor for the honors introduction to computer science (H211, Fall 2010), both the honors (H212, Spring 2011) and non-honors (C212, Spring 2009) second-semester computer science courses, and the data-structures course (C343/A594, Fall 2009 and Spring 2010). My responsibilities in these courses included preparing assignments and lab materials, running lab sessions, delivering lectures in discussion sections, grading assignments and tests, holding office hours, and mentoring students on semester-long group projects. I designed and implemented several new assignments and labs for these courses.

For my work in the data-structures course, I received the department’s Associate Instructor of the Year (2009–2010) award, an award that is largely based on student-written nominations.

The H211 course was being revamped the year that I taught it. The primary instructor and I collaborated closely on its design. In that course, we used Arduino hardware as a foundation for teaching and student projects. The students enjoyed the new course so much that they gave us thank-you letters at the end of the course.

I have also been active in mentoring students in undergraduate research programs. In the spring of 2011, I was a Research Mentor for two students at Indiana University. In the summer of 2014, I was a Research Mentor for four students at the University of Illinois at Urbana-Champaign.

A strong influence on my teaching style is a belief in the importance of helping students see and understand both the practical application and the broader context of what is being taught. The use of Arduino in H211 and the projects we designed in that class are examples of this. Another example is an assignment that I designed for the data structures class (C343/A594). In lecture, students were learning about set and graph representations, and earlier in the semester they had learned about and implemented stacks. I wanted to integrate these and give students an understanding of how these data structures fit into the design of a complete program. The assignment I designed had them create a pattern matcher for regular expressions (i.e., Unix “grep”) that used a regular-expression syntax that was postfix (i.e., reverse polish notation) and

---

1 At Indiana University, they use the title “associate instructor” where most other institutions would use the title “teaching assistant”.

1
was modeled using a non-deterministic finite automaton (NFA). This integrated well with the rest of the curriculum as many students were also learning about NFAs in the theory of computation course that they were taking concurrently.

Students implemented the assignment in two stages. In the first stage, the students constructed the graph for the NFA by parsing the regular expression using the stack implementations they had written earlier in the course. In the second stage, they implemented an execution engine for the NFA graph that matched the NFA against a string. They used a set representation to track which nodes in the NFA were active.

This assignment allowed students to see how the stack, graph, and set representations they were learning in lecture applied to a realistic programming problem. At each stage, we discussed the different representations of these structures as well as the advantages and disadvantages of each. Afterwards, several students made a point of telling me how much they enjoyed that particular assignment as it helped them better understand the practical application of the techniques being learned.

Quotes from Student Letters and Evaluations

“Thank you for being an outstanding AI this semester.” (Alex Liby)

“It was a pleasure being taught by you.” (Andy Spillman)

“The world needs more teachers like you.” (Jordan Tritell)

“Although I am an art major, this class was definitely my favorite of the semester.” (Brittany Keilly)

“Thanks for being the best AI that I’ve ever had.” (Kate Sanders)

“Michael is absolutely fantastic.” (Anonymous evaluation)

“He knows how to make students think through problems by giving hints and pointers in the right direction.” (Anonymous evaluation)

“Good pace, easy to understand, good at interpreting questions & explaining.” (Anonymous evaluation)

“Incredibly helpful and interested in student’s development.” (Anonymous evaluation)

“Michael was very helpful, knowledgeable, and insightful ... he inspired and educated.” (Anonymous evaluation)

Teaching Interests

I would be comfortable teaching any undergraduate course in the standard CS curriculum. Based on my training and background, I would be particularly well suited to teaching courses in introductory computer science, data structures,
Teaching Statement, Michael D. Adams

algorithms, programming languages and paradigms, theory of computing, and systems-level programming, as well as advanced courses in compilers, type systems, static analysis, and other topics classes in programming languages.

Teaching Experience

University of Illinois at Urbana/Champaign Urbana, Illinois

Undergraduate Research Opportunities in Computing April 2014 – July 2014

• Research Mentor for four undergraduate students

Indiana University Bloomington, Indiana

Associate Instructor Jan 2009 – May 2011

• Associate Instructor of the Year (2009–2010) – Computer Science
• CSCI H212: Introduction to Software Systems, Honors: Spring 2011
• CSCI H211: Introduction to Computer Science, Honors: Fall 2010
• CSCI C343/A594: Data Structures: Fall 2009 and Spring 2010
• CSCI C212/A592: Introduction to Software Systems: Spring 2009

Undergraduate Research Opportunities in Computing Jan 2011 – May 2011

• Research Mentor for two undergraduate students