

Teaching Statement

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As an educator in Computer Science, I strive to create a dynamic and interactive learning environment. My approach centers on “learning by doing”, where students engage in theoretical lectures, hands-on projects, and real-world problem-solving. By blending theoretical knowledge with practical experience, I aim to deepen students’ understanding and prepare them for the challenges of a rapidly evolving tech landscape. My goal is to help students develop critical thinking, problem-solving skills, and adaptability to emerging technologies, ensuring they become proficient and innovative professionals at your department.

1 Teaching Philosophy

I am passionate about creating a dynamic learning environment where students actively engage in their education. I believe that theoretical knowledge alone isn’t sufficient; it must be paired with practical experience. My teaching philosophy centers on “learning by doing,” incorporating hands-on projects, coding exercises, and real-world case analysis and problem-solving. This experiential approach is crucial for gaining and applying knowledge, ultimately providing students with the skill set to tackle challenges. Whether they plan to pursue careers in industry or academia, they will be succeeding and contributing to the rapidly evolving technological landscape.

I emphasize integrating foundational theories with practical applications for a comprehensive learning experience. From my experience as a **lab instructor CSE 364 Computer Security at Syracuse University**, I have observed that students gain a deeper understanding of concepts when they apply theoretical knowledge to real-world scenarios. For example, when I teach the buffer overflow attack in the **SEED Lab**, I guide students in examining attack details, including memory and stack layouts in ARM64 and AMD64 architectures, and address space layout randomization. They then adjust attacks for these different settings and launch the attacks on a provided program with a buffer overflow vulnerability. This approach transitions students from abstract concepts to hands-on practice, clarifying security mechanisms in theory and their real-world operation. Through these practical exercises, students deepen their understanding of the material and enhance their ability to implement security mechanisms. This blend of theory and practice equips students to tackle complex problems and adapt to evolving challenges in the field.

To further engage students, I plan to organize Capture the Flag (CTF) competitions, which provide a stimulating platform for students to apply their skills in a competitive and enjoyable setting. Students will be given different servers, each running a program with a buffer overflow vulnerability. They aim to develop a scheme to exploit the vulnerability and finally gain the root privilege on these servers. The challenge is to develop the best attack strategy and see which team can succeed the fastest. Additionally, I encourage students to help each other out without giving direct answers, but by allowing them to improve and refine their understanding by explaining concepts to others. This approach fosters collaboration and strengthens their grasp of the material. It also develops their communication skills, which are critical for explaining technical concepts clearly and effectively to others. This approach strengthens students’ critical thinking and problem-solving skills while deepening their enthusiasm and commitment to the field. Through these competitions, students see the direct impact of their knowledge. This reinforces their learning and builds confidence in tackling real-world challenges. By combining theory, practice, and interactive learning, students become not only knowledgeable but also adaptable and innovative as the field evolves.

In my lectures, I focus on structuring content to actively engage students with a clear, purposeful storyline. For example in my recent **guest lecture FIN 426 – Multi-National Financial Management at SUNY Oswego**, I begin the lecture with a central question, “What distinguishes blockchain technology from Web 2.0?”. I first provide an introduction to the development of blockchain to explain the underlying rationale for these differences. Then, I guide students through the various components that highlight these distinctions in technical detail. This approach ensures a logical progression, which helps students build a deeper understanding as they advance from one concept to the next. By linking each component, students can more clearly grasp the distinctions and complexities involved. I make complex concepts more accessible by demonstrating them through practical examples. For instance, in the guest lecture, I guided students through the step-by-step process of using a wallet to send a transaction, illustrating the entire transaction lifecycle. In this case, students not only grasp each step of the transaction lifecycle but also learn how to transfer cryptocurrency in real-world scenarios. This hands-on experience deepens their understanding of blockchain mechanics while providing practical skills they can apply beyond the classroom. This approach engages students by connecting theory with real-world application. It shows them the immediate relevance of what they’re learning,

fostering a deeper connection to the material. Active participation builds their confidence in navigating complex systems, making the learning experience more meaningful and impactful.

2 Teaching Interest

My teaching, research, and experience span a broad range of topics, which fuels my enthusiasm for teaching both graduate and undergraduate courses. I am eager to teach advanced subjects like computer security, network security, operating systems and computer architecture at the graduate level. Equally, I am excited to teach foundational courses at the undergraduate level, such as systems programming, data structures, algorithms, software engineering, and computer networks. I am also excited to develop new courses related to my research field, such as Blockchain Engineering, to keep the curriculum aligned with emerging technologies. This broad teaching portfolio reflects my commitment to providing students with a well-rounded and up-to-date education, preparing them for both academic and professional success.

3 Mentorship

I am always willing to take on opportunities to mentor students, believing that individualized guidance is crucial for their academic and professional growth. At Syracuse University, I have advised two international master's students in computer science, focusing on blockchain optimization research. Mentoring has taught me that each student has unique needs and learning styles. For instance, one student was highly independent, often delving deep into complex topics on his own. While this self-driven approach demonstrated initiative and a strong work ethic, it sometimes led him to explore less promising directions, which could result in wasted effort on unrelated topics. To address this, I worked closely with him to refine his research questions and provided targeted feedback to help him stay aligned with his project goals without limiting his curiosity. On the other hand, another student frequently sought assistance on simpler issues, often hesitating to tackle more challenging problems independently. Recognizing this, I encouraged him to take more ownership of his learning by setting small, manageable challenges that built his confidence over time. I also made a conscious effort to balance support with encouraging exploration, guiding him to become more proactive and self-reliant in his research. My approach to mentoring involves being readily accessible and fostering an open, supportive environment where students feel comfortable seeking guidance. To ensure they stay on track, I encourage regular, informal check-ins, which help maintain momentum and provide timely feedback. I have found that offering detailed feedback is one of the most effective ways to guide a student's progress and keep their research on course.

4 Conclusion

In conclusion, my teaching philosophy is rooted in blending theory with practical, hands-on learning. I believe active engagement through labs and real-world exercises is essential to deepen students' understanding and develop their critical thinking and problem-solving skills. By fostering an adaptable mindset, I aim to prepare students for the evolving challenges of the field, equipping them with both knowledge and the confidence to innovate in a rapidly changing technological landscape at your department.