My philosophy as an educator is rooted on two core concepts: *relatable* and *critical thinking*. Both of these concepts are applicable to computer science, and life in general, as both of these concepts help understand, analyze, and solve problems of the real world. In the following, I describe how my teaching philosophy revolves around these two concepts, and my teaching and mentorship experience over the course of my Ph.D.

Teaching Philosophy

Students are interested in topics that are *relatable* to them. Moreover, they become *invested* about such a topic when they think about it from a *critical perspective*. My teaching philosophy is based on these two observations. By engaging with the students in open-ended discussions that encourage critical thinking, questioning assumptions and beliefs, and exploring different perspectives, they learn about the nuances involved in the real world. As a result, complementary to the rather black-and-white binary thinking of computer science, students learn to think about implicit, hidden factors within, thus inspiring them to think critically with curiosity, thus motivating learning.

To elaborate, when it comes to the core-undergraduate level course I have instructed, I have noticed that students become much more interested in the topic once they find it *relatable*. Therefore, I invest time in getting to know the students and then give them relatable real-life examples, interacting with them throughout the lecture. I observed that students engage much more in the class when they experience relatable stories, examples, or narratives while learning about a particular topic. For example, when I was the teaching instructor for an introductory course in programming, I introduced the functions of a programming language while giving the example of photo filters found in social media applications. As a result, students could develop an intuitive understanding of functions in programming language, regardless of their non-CS background, and became much more engaged. Moreover, I encourage the students to ask me questions and take pauses now and then so that any student can ask about anything that may improve their understanding of the topic at hand. Sometimes, I ask simple questions in the class as examples so that students are not hesitant to ask questions, even if they consider it "easy".

For upper-level courses I have guest lectured, i.e., for both security and software engineering courses, in addition to making the contents *relatable*, I also focus on *critical thinking*, asking them the 'why', 'what' and 'how' related questions, such as *why* are certain design choices are made in a system, *what* design choices are the possible alternatives, and *how* trade-offs in between the alternatives are determined. Furthermore, I provide them with relatable scenarios based on freshly learned concepts and ask them whether they would prefer a particular alternative design in that particular scenario over the existing designs, and if so - why. Such discussions lead to an increased, in-depth understanding of the topics being taught while nurturing and growing the student's mindset about critical thinking. For example, when I gave a guest lecture on security, I discussed with the students why focusing on reducing false positives (i.e., incorrectly identified bugs) is much more concerning than false negatives for generic tools. In contrast, false negatives must be prioritized for security since the impact is much more significant. Understanding these concepts while considering nuances helps the students develop skills that help them with both research and beyond their graduate life.

Teaching and Mentorship Experience

As a PhD Student, I have gained different teaching and mentoring experiences with many graduate and undergraduate students both in the USA and internationally.

Instructor of Record: I was hired at William & Mary to teach Programming for Data Science (CSCI 140), an entry-level course that can be taken by any student, irrespective of background, who wants to get familiar with programming. As I was on very short notice, I had to adapt/reuse the existing teaching and evaluation materials weekly throughout the semester. Therefore, I focused on factors in my control: *the teaching environment*, i.e., the interaction of students with me in the class and beyond. As a result, in my teaching evaluation, the students overall gave feedback that they felt encouraged to ask questions as I was approachable ("*I really liked how patient he was ... Every class he encouraged us to bring up anything we didn't understand...*"), and encouraged discussion in the class ("*... always responsive to questions ... promoting a classroom environment that encouraged asking questions*"). Multiple students contacted me for recommendation letters for computer science-related scholarships/fellowships after the course and expressed their gratitude as taking this course encouraged them to take computer science as a major.

Guest Lecturer: I have taught as a guest lecturer in multiple graduate and undergraduate level courses at William & Mary (*CSCI445 - Mobile Application Security, CSCI667 - Concepts of Computer Security, CSCI680 - IoT Security and Safety*), and the University of Central Florida (*CEN 5016 - Software Engineering*). In these courses, I have taught about the trade-offs and design choices made by static analysis-based security testing tools, mutation testing, research methodology related to empirical analysis and qualitative research, security certification of mobile applications, and use/misuse of cryptographic API misuse. By lecturing at different universities, I gained in-person and online teaching experience.

Developing a Research-focused Outreach Program: To encourage international research collaboration and mentorship, I developed an outreach program for connecting the faculty members of the William & Mary Computer Science program with the students of my alma mater, the Institute of Information Technology (IIT-D), University of Dhaka, one of the top three universities in Bangladesh. Through this outreach program, students of IIT-D can perform their capstone project with W&M faculty as research advisors and their senior graduate students as mentors, thus letting them gain valuable research experience. I mentored four students in this program and have published a demonstration paper with two of them as co-first authors at the ESEC/FSE'23, and they have received full-funded Ph.D. admission offers at top-tier CS programs in the USA, including Purdue University.

Mentoring Graduate and Undergraduate Students: As the lead graduate student of the Secure Platforms Lab at William & Mary, I mentored graduate students, namely Prianka Mandal, Victor Olaiya, and Akram Khan, helping improve their research, communication, and leadership skills. In weekly lab meetings, I led discussion of interesting, upcoming research papers, which helped them improve their critical thinking skills. Moreover, I mentored over 20 undergraduate and graduate students as semester-long Project Manager for Software Engineering classes.

With my experience as a teacher and mentor, I have learned different strategies that increase my effectiveness in these roles while being aware of the different needs of individual students, allowing me to guide them towards paths that align with their own needs.

Teaching Interests

My primary interest lies in teaching graduate and undergraduate-level courses in computer security. Given my background, I want to teach security-focused courses, such as Concepts of Computer Security and Security of Mobile Applications. Moreover, to recruit graduate students, I am interested in teaching a graduate-level introductory course in computer security in my first year to seek and recruit students interested in security research.