**Statement of Teaching Philosophy and Interest**

**Mohiuddin Ahmed**

Teaching provides me the opportunity to mentor, inspire, and interact with young and curious students. Enlightening young-minded students gives me enormous satisfaction and provides me a

platform to become a lifelong learner. I consider it a privilege to participate in the initial stages of their journey. My experiences as a teacher and researcher have prepared me to be able to teach undergraduate and graduate courses on Information Security and Privacy, Infrastructure Security and Privacy, Network Security, Penetration Testing, Software engineering, Operating Systems, Object-oriented Programming Language and to advise students on a wide range of topics. I plan to teach fundamental theoretical concepts using trending technologies to keep students excited and give them experience with recent tools required for developing cutting-edge technologies in both industry and research.

**Teaching Experience**

The first time I experienced teaching was during my sophomore year; I worked as a tutor to help students prepare for extremely competitive university entrance exams. I also taught courses in the foundation year program that prepares high school students for their undergraduate studies. Additionally, during my industrial tenure, I led a team of three software developer and trained them for one years. These experiences helped me to comprehend the psychology of people of different ages and different walks of life.

During my tenure at the University of North Carolina at Charlotte, I served as a Teaching Assistant for several undergraduate and graduate-level courses, including *Principles of Information Security and Privacy*, *Enterprise and Infrastructure Protection*, *Secure Programming and Penetration Testing*, *Introduction to Information Security and Privacy*, *Knowledge Discovery in Databases*, *Introduction to Operating Systems and Networking*, and *Software Engineering*. In these roles, I engaged in diverse teaching responsibilities, such as delivering lectures, developing course materials, and mentoring students in both online and offline settings. I regularly conducted sessions on complex topics like network intrusion, logic programming, and advanced threat analysis, tailoring my approach to address the varied learning needs of the students.

A significant aspect of my teaching experience involved designing hands-on demonstrations and interactive exercises to deepen students' understanding of theoretical concepts. I created practical demos on malware analysis, event monitoring, and secure programming, allowing students to gain real-world insights into cybersecurity challenges. I was also responsible for developing and grading assignments, quizzes, and exams, ensuring that the assessments were both challenging and fair, aligned with the course objectives.

In addition to teaching, I assumed leadership roles, such as coordinating a team of six teaching assistants for courses like *Operating Systems and Networking* and *Software Engineering*. I managed grading tasks, ensured consistency in evaluation, and provided guidance to the team to maintain high standards in instruction and support. My leadership extended beyond teaching duties, as I mentored junior Ph.D. students in the CyberDNA Lab, assisting them in research development, system implementation, and scholarly writing. This combination of teaching, leadership, and mentorship reflects my commitment to fostering a collaborative and intellectually stimulating learning environment, which I aim to bring to my future academic roles.

I have further developed my teaching skills more rigorously at the University of North Carolina at Charlotte. I was very fortunate to teach both undergraduate and graduate students over the past five years, as a teaching assistant (TA). I was involved in courses ranging from the introductory level to specialized courses in different areas of computer science. In two of these courses (Web-based and Network-based Application Development), I was the primary teacher responsible for creating syllabi, producing and delivering lectures, holding tutorial sessions and office hours, constructing exams, setting the grading policies, and instructing the TAs for grading students' coursework. Each course presented a delightful opportunity to discover and improve my inner potential as a teacher. These courses were for both graduate and undergraduate students - having over 80 students. In these courses, I carefully created teams combining students from different levels where excellent students work as mentors in their groups. I developed team activities to increase peer collaboration. I conducted online midterm evaluation surveys to receive feedback on the ongoing course and incorporated them into the rest of the course. For both of these courses, I have been responsible, with two faculty members from the CS department, to update the CS curriculum, consider the most current industry requirements, and follow the accreditation unit's standards. I also helped to create a course evaluation question bank to ensure that instructors could obtain robust analysis and reporting to inform both course- level pedagogy and program-level curriculum further. The University's quality assurance committee has been very active in ensuring the best teaching and learning experience.

I started my career as a teaching assistant (TA) in advanced-level courses such as - "Secure Programming and Penetration Testing" and "Database Management Systems." My responsibilities were grading, preparing course materials and course assignments, and lab instruction. Later, I was the lead TA twice in "Web-based Application Development," where I collaboratively worked with other TAs on guiding them in answering the students' questions and various course tasks- including designing projects and course projects. As a senior Ph.D. student, I have had the opportunity to assist my advisor, Dr. Wenwen Dou, with the courses - "Visual Analytics" and "Web Mining."

My office hours allowed me to interact with students individually and get their feedback on various issues. For example, I was surprised to learn that many students look through class slides before the class. Given this feedback, I ensure that I make my teaching slides available beforehand. I learned that grading could be a contentious issue if the grading scheme is not made clear beforehand. Students are much happier if a detailed grading scheme is provided for each question in an exam or assignment rather than a coarse evaluation. Many of these finer details, which may not directly get discussed in the classroom, came to my attention through individual interactions.

I have organized and delivered talks at annual workshops held by my lab and have presented my research results at several major conferences. These experiences have provided me with valuable opportunities to hone my pedagogical and methodological perspectives in a variety of settings and taken me closer to find the answer of what motivates people.

**Teaching Philosophy**

As an academician over these past years, my teaching experience helped me develop and refine my teaching philosophy. I see teaching as an enlightenment process that feeds students with knowledge, opens their minds, and equips them with the right tools to become independent learners. I believe my role as a teacher in the learning process should be like a map for a wandering traveler. My desire is to create a stimulating educational environment where students can meet their full potential and grow physically, mentally, emotionally, and socially. Once students master the course's basic concepts, I should encourage them to be their teachers, question the known, find the unknown, and reason about it. I believe students are unique, and each of them has specific learning needs and styles. I will present a curriculum that will incorporate each learning style and the content relevant to the students' lives. I will help my students express themselves, accept themselves for who they are, and embrace others' differences. I will include hands- on learning, cooperative learning, projects, themes, and individual work that engage and activate students learning. They will develop independent thinking ability, which is crucial for research and industry jobs in the CS field.

As a CS education researcher and a community member of "Learning Analytics," my experience helped me shape and design courses and opened many unknown dimensions to study and improve students' performance. This experience also taught me how to involve policymakers and student advisers in the knowledge discovery process to better understand their students. Based on my observations, I believe that young students get more excited and motivated when they can code conceptual ideas into final products in games or usable software. I also believe in keeping students engaged through a "semi-structured" and interactive class experience. From the first day, I expect to ask questions and initiate discussions that require active participation. I will always be open to their feedback. Like many of my colleagues, I use PowerPoint slides to help organize and summarize lecture material. However, my slides have portions that are deliberately left blank and must be filled in during class discussions or worked out on the discussion board with student input. For example, in the "Web-Based Application Development" class, I use the board to study different design choices based on student participation using their preferred ideas.

However, teaching, especially at the graduate and undergraduate level, requires a systematic and coordinated effort, with a deep understanding of the students' psychological state and the subject to be taught. Based on my personal experience, I realize that a student's ability to perform depends on his/her confidence and courage to apply the knowledge gained. Hence, I believe that a successful lecture stems from the careful selection of the materials, a concrete schedule for teaching and learning, and a detailed teaching activity plan; this approach will enable students to apply their knowledge. I would like to create an atmosphere in which students feel comfortable approaching me for discussions, which will enhance the trust between a teacher and students. Extensive communication with my students can help me tailor the lecture material and adjust the lecture pace according to their interests and understanding level. Additionally, it will improve my skills as a science communicator.

**Teaching Plan**

Given my teaching experience, I am looking forward to teaching courses to both undergraduate and graduate students ranging from introductory classes to upper-level courses. My experience with introducing computer science problems and techniques to novice and interdisciplinary students has prepared me to teach introductory courses, whether as a programming class or intermediate classes in data structures and algorithms and database management. My research background powerfully equips me for teaching upper-level courses in Artificial Intelligence, particularly in Applied Machine Learning, Natural Language Processing as well as Visual Analytics, and Data Science. The era of big data increases the importance of teaching specific areas in Artificial Intelligence, particularly Machine Learning and Data Science. My research experience will help me design graduate courses such as Deep Learning in Data Science and Reinforcement Learning (RL) - emphasizing Deep Learning (DL) into the automatic analysis of big data. To prepare students for future job opportunities, I will seek collaborative research projects with industry, and students will be encouraged to turn their course projects into publishable research papers.

**Mentoring Students**

My desire to engage, challenge, and inspire my students' growth is not limited to the classroom. My

willingness to collaborate with students translates into the research domain, where I enjoy working closely and mentoring junior collaborators. My goal is to share with students the awe and excitement and the dedication and hard work that comes with using research tools to ask and answer questions. As a senior Ph.D. student for different collaborative projects, I mentored two junior Ph.D. students. I mainly guided them on writing papers, basic concepts on Information Security, Malware analysis and different NLP techniques for data mining. I assisted them with code and tool debugging too. This experience gave me the confidence to teach courses in the subject areas mentioned above. Mentoring students has improved my research and writing since I review and present topics differently with a broader perspective and before new audiences.

**Conclusion**

I am confident that my strong passion for science communication, solid academic background, and ability to present my work effectively will strongly contribute to your curriculum. I would appreciate the opportunity to join your department and to contribute to its academic success.