Teaching Statement

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Designed and taught **many core and effort-intensive courses**, achieving an **average student feedback rating of 4.13/5**. Secured **Quality Matters (QM) certification** for all my courses. Led curriculum update efforts to design and integrate a Data Structures course taught in multiple programming languages. Implemented **module-based content distribution** with live feedback, and class projects on **Chameleon cloud platform**.

Teaching Philosophy

As an Assistant Professor, I am thrilled by the opportunity to fully integrate teaching and mentoring into my daily routine. My goal is to motivate students to acquire and apply knowledge, teach them critical thinking skills to solve newly occurring problems in their fields of study, and assist them in building career foundations to succeed after graduation. I emphasize to students that the specifics of all the programming languages, libraries, frameworks, and deployment services that are in vogue at the moment can change at a rapid pace. *All new technologies are easy to learn once students have developed strong foundations.* Apart from the technical depth of content, I also encourage everyone in the classroom to express their thoughts. To bring technical subjects to life, I teach using a combination of various techniques such as whiteboard discussions, PowerPoint presentations, and audio-visual illustrations, such as a demo of sorting algorithms using UNO cards. A sample of my demonstrative lecture can be found here.

I believe that students learn more by thinking than by memorizing. Therefore, before delving into any new topic, I explain the key challenges and questions that initially motivated its exploration and how various ideas evolved over time to nurture problem-solving capabilities. For example, in this lecture on solid-state drives, I first explain why students should learn about the topic, highlighting its exciting advantages and key challenges that motivated various branches of different research works.

In the growing and ever-changing field of computer science and engineering, I view teaching not only as the transmission of knowledge to students but also as a means of inspiring independent inquiry and learning. *It is a collaborative process that fosters improvement for both students and me.* To illustrate how I embody these principles in my lectures, consider this lecture on NAND cells within SSDs. As students gain insights into the complexities of NAND cells, I, too, gain a deeper understanding through the process of explanation, fostering a continuous cycle of learning and teaching in the ever-changing landscape of computer science and engineering. Recognizing the uniqueness of each student, I have learned and will continue to tailor my mentoring style to bring out the best in every individual.

Teaching Experience

At FIU I have designed two courses from scratch and taught multiple semesters of graduate and undergraduate courses in different modalities, including in-person, certified hybrid, and certified synchronous and asynchronous online formats. The courses I taught include Storage Systems and Data Structures, Independent Study, Senior Project, and Capstone Project. For all my courses, I have developed module-based content that provides the necessary scaffolding to span the space for better understanding of the concepts learned. With input from peers at the Center for the Advancement of Teaching (CAT), colleagues within our department, teaching assistants, and student feedback, I have taken several measures to enhance the teaching process. These include developing a precursor covering basic concepts before the start of the course, creating a mechanism to incorporate student feedback during the same semester, and crafting a well-structured syllabus with course-level objectives. Additionally, I have outlined module-level objectives and explained their alignment with course-level objectives, improved course content, and designed clear rubrics for all assignments, making it easier for students to understand expectations. Next, I elaborate the content of some of my courses, highlighting my favorite parts.

Storage Systems (CIS 5346): Teaching the advanced graduate-level Storage Systems course has been a stimulating academic pursuit. This course delves into a diverse array of topics, encompassing the introduction to storage systems, storage devices (Hard Disk Drives, Solid State Drives), storage system components, storage architecture, large-scale distributed storage systems, datacenter storage, non-volatile memory (NVM), reliability and fault tolerance (RAID Systems), performance, file-systems, operating systems storage management, memory and storage concepts (Caching, Consistency, and Deduplication), disks and scheduling, and emerging storage technologies and future trends.

One of the key challenge to efficiently teach this course extends beyond disseminating theoretical knowledge; it lies in cultivating a profound curiosity for the rapidly evolving landscape of storage technologies. Through hands-on projects and real-world case studies, my aim is to facilitate a dynamic learning experience reflective of the practical demands within the field. The class structure combines traditional instruction with seminar-style learning, fostering a dynamic educational environment. Each student is tasked with extensively preparing and leading discussions on a research paper, enhancing their ability to critically evaluate and present findings to their peers. This multifaceted approach aims to nurture a cohort of learners equipped not only with theoretical comprehension but also with a problem-solving mindset, preparing them to confront the evolving challenges in the technological landscape.

The most recent offering of this course underwent evaluation by students through the Student Perceptions of Teaching Survey (SPOTs), yielding a commendable mean score of **4.64/5**. Notable comments from students include, "The most successful aspect of this course is the detailed information in the lectures about the objectives and executions of each module and great instructor-student interactions." Another student mentioned, "The professor's availability and commitment towards every student was commendable." Additionally, a student highlighted, "This was the best online course that I have taken so far, expertly crafted, and the pacing of this course was good." Lastly, a student appreciated the practicality, stating, "The way we could relate the course to real-life scenarios will definitely help me never forget what I learned. Course material and discussions are thought-provoking and interesting." The positive feedback reflects the effectiveness of the course structure and content delivery, as well as my commitment to facilitating an engaging and enriching learning experience.

Data Structures (COP 3530): Teaching COP 3530 has been fulfilling, impacting students' job interviews. This course starts with a "Brush-up Your C++" module and progressing to Big-O complexity, stacks, queues, linked lists, searching and sorting algorithms, graph and tree algorithms, recursion and backtracking, and hash tables. The curriculum includes quizzes, discussions, assignments, and a final exam, incorporating real-world applications and practical problem-solving scenarios. With the aim to enhance students' understanding of memory management, particularly beneficial for system-related courses like operating systems and high-performance computing, I designed this course from scratch in C++. Having completed the hybrid certification process, I taught my Data Structures course in a hybrid modality for multiple semesters. Initially, I found it challenging to motivate students for out-of-class components. To address this, I conducted surveys and polls on each module to gauge student understanding of various out-of-class topics. Based on the poll responses, I curated the time I spent on each topic and revised the topics that most students found challenging. This approach significantly improved student interest and performance.

COP 3530 earns its "effort-intensive" label due to students' substantial growth expectations post-course and a high enrollment rate. In Fall 2023, my SPOTs rating was **4.19/5**. Students praised my class for being "well-structured," with one noting, "The most successful aspect is probably having discussions for each Module." Another student commended the "Professor's teaching proficiency" with a "5+ stars" rating, emphasizing, "The professor is great at conducting and organizing an online course." My "video lectures" were highlighted for their "easy-to-understand quality." Overall, the course was recognized for its "balance, pacing, and real-world applicability, making it a transformative and great learning experience."

Independent Study (CIS 5900 and CIS 3900): In my role as the instructor for Independent Study courses CIS 5900 and CIS 3900, my primary responsibility is to facilitate a self-directed and personalized learning journey for each student. Through regular individual meetings, I offer tailored guidance and support, recognizing and addressing the unique academic goals and interests of each participant. The course framework includes assigned readings that lay the groundwork for independent investigations, culminating in students producing comprehensive reports documenting their research findings. The inherent challenges of this instructional role involve instilling a sense of accountability and motivation in students navigating their project independently. Achieving the delicate balance between providing sufficient guidance and allowing for student autonomy is critical to ensuring a fruitful independent study experience. Equally important is maintaining open communication channels and promptly addressing any issues that may arise during the independent learning process. These efforts collectively contribute to fostering a supportive and enriching educational environment within the framework of independent study.

Overall, many students have found success in securing co-op, internship, and full-time opportunities with top industries such as Google, Microsoft, Samsung, etc., after taking my courses and working with me. Witnessing my students' achievements brings me great joy, and I take pride in their success.

Mentoring Experience

In my role as a mentor, I have been deeply committed to fostering an environment where students can not only gain knowledge but also thrive in their research pursuits. I draw inspiration from the supportive mentors who guided me throughout my career. I aim to pass on not just information but also provide a nurturing and engaging space for students to develop their research abilities. Having mentored both undergraduate and graduate students, I understand the importance of effective communication tailored to each student's needs. I recognize that the level of involvement in technical details varies among students, and I strive to strike a balance between offering prompt feedback and allowing for independent exploration. My goal is to nurture students' research independence while creating a collaborative and inclusive atmosphere. In terms of academic supervision, I take pride in the success of my graduated Ph.D. and M.S. students who have secured positions in reputable companies or obtained tenure-track positions. Currently, I am advising four graduate and three undergraduate students, each delving into innovative research topics encompassing storage systems, memory management, ML-for-Systems, Systems-for-ML, and cloud computing. Additionally, I actively participate in Ph.D. committees for students from various universities, contributing to their academic growth. My mentoring extends to independent study projects, where I guide students through topics such as hybrid memory management and SSD reliability. In REU programs, I provide support and guidance to students, fostering a supportive learning environment. Furthermore, I offer direction to students in capstone projects, ensuring their successful completion and preparing them for future challenges. Overall, my mentoring experiences reflect a commitment to students' growth, emphasizing collaboration, communication, and a focus on their individual development as researchers.