

Teaching Statement

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I view teaching as a foundational component of my identity as a scholar. My decision to pursue a career in academia stems from a passion for mentoring students through challenging concepts and fostering collaborative, inquiry-driven environments. I believe Data Science and AI education is central to empowering society, as digital systems now shape nearly every domain from healthcare to climate science. My goal is to enable students to build confidence in their own abilities while preparing them for lifelong learning in an evolving technical landscape.

Pedagogical Approach and Evidence-Based Practice

My teaching philosophy centers on creating active, experiential, and inclusive learning environments that empower students to bridge the gap between theory and practice. Within the classroom, I employ a diverse toolkit of active learning techniques to sustain engagement and foster collaborative inquiry. I implement the **Flipped Classroom** model and **Think-Pair-Share** exercises alongside frequent in-class coding tasks, encouraging peer-to-peer problem solving. I enrich this experience through real-world integration, bringing authentic datasets from my research in healthcare and climate informatics directly into the curriculum. Working with these complex, often messy data structures, students learn to integrate technical mastery with domain knowledge while developing critical awareness of the ethical implications inherent in data-driven discovery.

I view teaching as an iterative and continuous learning process. I regularly solicit student feedback through **mid-semester surveys** and informal check-ins, allowing me to adjust course design early and ensure every student has the support necessary to succeed. Anonymous feedback receives the same weight as signed feedback. When multiple students share the same confusion, the responsibility for clarifying lies with me, not with them.

Three Operating Commitments

Concrete artifacts before formal definitions. Every topic is introduced through working code or a concrete example before any formal definition. The underlying principle is then derived from what students have just observed, and a graded extension is assigned during the same class session. The sequence is diagnostic first, expository second, applied third.

Frequent low-stakes assessment. Short retrieval problems open each class meeting, with answers reviewed within five minutes. This allows me to identify students falling behind before the first major exam rather than after.

Transparent grading. Solution rubrics are published with every assignment, so grade disputes are resolved in a single exchange. Students understand expectations in advance.

Teaching Experience and Versatility

At the University of Maryland, Baltimore County, I have developed significant instructional versatility through five consecutive semesters as a Graduate Teaching Assistant across four distinct courses. My responsibilities have spanned the full academic spectrum, from leading review sessions and tutoring students individually to refining instructional materials to align with learning objectives.

In **Structured Systems Analysis and Design**, I coached students through process modeling and the creation of robust design specifications. My work in **Database Program Development** and the **Advanced Database Project** involved mentoring students through the complete database lifecycle, with emphasis on schema optimization, technical rigor, and the practical implementation of SQL workflows. In **Management Information Systems**, I facilitated high-level discussions on the practical impact of IT systems and how data-centric tools drive organizational decision-making. These experiences, combined with my guest lectures in Causal AI based on dissertation research, have prepared me to deliver comprehensive curricula across the data science and computer science spectrum.

Courses Prepared to Teach

Direct match (TA experience): Database Systems, Systems Analysis and Design, Software Engineering, Management Information Systems.

Strong match (training and research): Introduction to Data Science, Introduction to Programming, Data Structures, Algorithms, Discrete Mathematics, Probability and Statistics for Computer Science.

Graduate and advanced electives: Artificial Intelligence, Machine Learning, Deep Learning, Data Mining, Time-Series Analytics, Applied Machine Learning, Statistical Learning.

Specialized electives I can develop: Trustworthy AI, Causal AI for Decision Systems, Adversarial Machine Learning, Machine Learning for Intrusion Detection, Privacy-Preserving Machine Learning.

Proposed New Graduate Elective: Causal AI for Decision Systems

To further support forward-looking scholarship, I propose the development of a new graduate-level elective in **Causal AI for Decision Systems**. This course bridges the existing gap between traditional machine learning and formal causal inference, focusing on how researchers can move from identifying simple correlations to understanding the underlying mechanisms of causation. Students will explore structural causal models, do-calculus, time-series causal discovery (the area my dissertation contributes to), counterfactual reasoning, and algorithmic fairness. These methods will be applied to real-world datasets from healthcare informatics and climate science, where automated decisions carry significant consequences. By integrating these emerging fields into the curriculum, I aim to prepare students for leadership roles where they design AI-driven solutions that are not only high-performing but also transparent and trustworthy. I have developed a complete 44-slide module with embedded quizzes, technical notes, and a hands-on case study using the CDANs Python package, ready for deployment in year one.

Mentorship and Career Preparation

In the UMBC Causal AI Lab I have co-authored peer-reviewed publications with junior Ph.D. and M.S. students at venues including KDD, MLHC, AAAI, IEEE ICMLA, and IEEE PerCom. I scope literature reviews with students, draft experimental plans together, debug their pipelines line-by-line when results stall, and run mock conference presentations before submission. As a faculty member I will translate

this pattern into structured undergraduate research and capstone supervision through a weekly research clinic, resume and GitHub portfolio reviews keyed to the major, mock technical-interview rounds twice per semester, and a graduate-school application track for students moving into M.S. or Ph.D. programs.

Student-Centered, Inclusive Classroom

Computer science and data science classrooms gather students at substantially different levels of prior preparation. Some have written code since middle school; others encounter programming for the first time at university. I design every course with multiple on-ramps: optional review modules, paired programming during lab sessions, structured office hours that prioritize first-generation and underrepresented students, and anonymous mid-semester surveys that I use to adjust pace, examples, and assessment formats. The objective is for every student to leave the classroom with both the technical knowledge and the confidence to keep learning after the semester ends.

Conclusion

My background in Statistics and Information Systems uniquely positions me to bridge rigorous mathematical theory with complex computational systems. I am committed to high-impact research in Causal AI and to a student-centered approach to pedagogy, and I am eager to foster a research environment that empowers students to tackle meaningful societal challenges. By integrating emerging topics such as algorithmic fairness and counterfactual reasoning into the curriculum, I aim to prepare the next generation of data scientists to be responsible, transparent, and innovative leaders.