

# Teaching Statement

**Sal Aguinaga**

University of Notre Dame  
Department of Computer Science and Engineering  
saguinag@nd.edu

Education is a space to explore, create, and imagine our biggest dreams. Working with students who are curious and eager to investigate the leading edge of computer science, is a privilege and a challenge that I hold in high regard. My academic training in computer science and over ten years of industry experience in electrical engineering and neuroscience research has prepared me for this role where the pursuit of knowledge and student success is the goal. I want to share my passion for research while guiding students to harness their strengths and knowledge to make their mark in the world.

## Teaching Philosophy

My outlook on teaching at the undergraduate level involves laying a foundational knowledge of the field that will inspire students to ponder the grand ideas and problems of the field. At the graduate level, the goal is to provide the path to investigate and solve those profound questions.

To set the proper culture of knowledge and investigation in the classroom, I have spent time keeping up with the latest research of effective teaching methods. Employing learning strategies effective in the classroom is essential to my course design. For example, splitting a typical lecture into two or more 15-minute segments with hands-on mini activities designed to retain knowledge and encourage critical thinking, and collaboration. In workshops offered by the [Kaneb Center for teaching and learning](#) I have practiced many active learning strategies to obtain a certificate in the *Striving for Excellence in Teaching* program.

Building relationships with students can be critical to their success, particularly with those historically under-represented in the field. Since growing up in a rural town in Mexico, I have experienced unique challenges on the path from farming with a horse and plow to the halls of academia. I am aware and value the diversity of experience students bring particularly those underrepresented in STEM fields. It's important to acknowledge these differences and to actively encourage a more diverse and representative field, which will only broaden our ideas and enhance our ability to collaboratively solve problems.

I favor an interactive approach in the classroom. Students learn through hands-on experience and through in-classroom collaboration and discussion allowing them to learn from each other with the guidance of the instructor. Class projects provide a medium for motivation, creativity, and inspiration. Research projects with a significant development component help undergraduates learn the scientific process. I have supervised and mentored students working on undergraduate research, many of which were thrilled to have contributed to the publication of that work.

## Experience In Teaching

Another graduate student and I taught a semester-long course on Mobile Computing: “[Mobile Application Projects](#)” for upper-class undergraduate and graduate students in the Department of Computer Science at the University of Notre Dame. What made material challenging but also fun was the interdisciplinary nature of the various topics including iOS and Android operating systems, user-interfaces, graphics, sensors, databases, networks, and more. I was able to arrange, given my industry contacts, a guest lecture from an OS evangelist at BlackBerry. Through this, we were able to have our students participate in a BlackBerry campus competition, consisting of building an app for BlackBerry. We were so proud when a pair of students from our course went on to win the [competition](#).

In the role of a Teaching Assistant I had the opportunity to teach many classroom lectures on fundamental course concepts. These courses include, operating systems, database system concepts, and Fundamentals of Computing II, an introduction to C++ programming. The Research Experience for Undergraduates ([REU](#)) is another teaching opportunity I have had in past summers. This program exposes young undergraduate students to research projects that can lead to publishing in peer-review venues. I have also taught Research Experience for Teachers ([RET](#)), a unique program geared toward working with highschool classroom teachers. By exposing them to research concepts and improving coding skills, they were able to take this back to their students and inspire and expose them to STEM fields.

## Teaching Preference

My academic training, various professional work, teaching, guest lectures and conference talks have prepared me to teach courses from a broad range of areas. For undergraduate courses at the junior/senior level, I would like to teach complex network analysis, data mining, or a hybrid of these courses as requested. I believe these courses are fundamental to a holistic education in Data Science.

Many of the courses in my computer science training are generally suitable for a wide range of applications and fields. For graduate-level courses, I would like to design an interdisciplinary course that integrates materials from computer science, mathematics, and engineering to explore and find solutions to problems in diverse areas such as life sciences, neuroscience, and social science. I would like to organize student driven seminars that enable and empower graduates to learn, share, and discuss research results. This will sharpen their communication skills, strengthen their critical thinking, and problem-solving skills.

A strong foundation in basic knowledge, the scientific method, and the ability to collaborate with great minds is essential to the future of the field where we can truly change the world. It would be the ultimate privilege to be able to guide, inspire, and challenge students to explore big ideas and prepare inquisitive minds to tackle the challenges of the future.