

Doug Gabauer ('01, '03 MS) reflects on multidisciplinary research at Rowan

Doug Gabauer was born in Bordentown, NJ, just south of Trenton. His father was a police officer in Trenton who worked his way up the ranks, retiring as deputy chief. His mother first worked as a legal assistant, then worked at home. He is the eldest of four siblings and the only engineer of the bunch. One brother sells commercial insurance for a New Jersey firm, the other brother is a co-owner of a Colorado-based restaurant chain called Fat Shack, and his sister is a nurse in New Jersey.



Doug graduated in Rowan's second engineering class in 2001. He went on to complete a PhD at Virginia Tech in 2008 and has been a Civil and Environmental Engineering professor at Bucknell University since then.

I decided on Rowan primarily because of the small classes and close-knit faculty-led undergraduate-focused teaching environment. The prospect of being part of a new engineering program also intrigued me and attracted me to Rowan. I chose Civil and Environmental Engineering (CEE) because of the obvious connections to society--buildings, roads, bridges--that are readily apparent and vital to everyday life. I also thought CEEs would have more opportunity to get out of the office and work on different projects.

During my first year at Rowan, classes and faculty offices were still in the library and Memorial and Bosshart Halls. The environment was very welcoming, and I made immediate connections with fellow students and the faculty. I recall groups of us working together for hours at the whiteboards in the library conference rooms completing assignments, mostly for Professor Gabler's Statics and Professor Marchese's Solid Mechanics courses. I was also on the concrete canoe team that won regionals and went to San Diego for the national competition.¹ In addition to the Statics and Solid Mechanics courses, other courses that stood out include Professors Sukumaran's Geotechnical Engineering course, Cleary's Concrete Design, and Mehta's Advanced Transportation course.

After I graduated in 2001, I worked as a consulting engineer at Alaimo Engineering for a year (I had interned there over the summer while I was a student). We were the township engineers for many New Jersey communities, and I gained valuable real-world engineering experience toward earning my Professional Engineer's license.² While working for Alaimo, I came back to Rowan for an Order of the Engineer³ ceremony and sat next to Professor Gabler. He convinced me to come back to Rowan for a Master's degree working on a project related to Event Data Recorders (like an airplane black box but for an automobile).

After getting my Master's, I stayed another year at Rowan as a researcher to finish two New Jersey Department of Transportation-funded research projects and to teach Statics and Dynamics to Rowan electrical engineers. By then Professor Gabler had moved to Virginia Tech and I joined him in 2005 to begin work on a PhD. I finished in 2008 with a dissertation titled "Predicting Occupant Injury with Vehicle-Based Injury Criteria in Roadside Crashes". [Editor's note: Sadly, Hampton Clay Gabler III, professor in biomedical engineering and mechanics at Virginia Tech died on January 11, 2021. He was one of the first Mechanical Engineering professors at Rowan.] Shortly after finishing my PhD in 2008, I joined the Civil and Environmental Engineering faculty at Bucknell University

where I continue to teach and do research related to protecting occupants when a vehicle departs the roadway.

I found that my time at Rowan had prepared me well for my graduate studies and beyond. My PhD research was very much multidisciplinary, examining injuries (Biomedical Engineering) in vehicle crashes with roadside hardware such as guardrails (Civil and Environmental Engineering). The Engineering Clinic⁴ projects I participated in at Rowan, all of which were multidisciplinary, helped me excel at the intersection of these different engineering disciplines. There was also specific writing and speaking training in the Clinics, as well as many opportunities to write and present in other CEE and engineering courses. Practice in these areas contributed to my ability to write sound technical reports, journal publications, and develop effective presentations to communicate research results. Furthermore, all of the Rowan faculty were exemplary instructors and a number of the techniques they used during my time at Rowan shaped how I teach my classes today. Examples include Professor Marchese's tireless use of physical props to demonstrate solid mechanics concepts and Professor Mehta's sheer enthusiasm for asphalt concrete, and its distinct odor (one would have thought he was smelling roses), even when class was at 8 am in the morning.

Based on an Interview with Jess W. Everett on January 26, 2024

1. The American Society of Civil Engineers sponsors regional and national competitions in which college students design, make, and race canoes made of concrete.
2. The Professional Engineer license (PE) is a "standard recognized by employers and their clients, by governments and by the public as an assurance of dedication, skill and quality...Only PEs can sign and seal engineering drawings...To become a Licensed Professional Engineer, you must do four things: graduate from an accredited engineering program, pass the Fundamentals of Engineering (FE) exam, work with a professional engineer for four years, and pass the Principles and Practice of Engineering exam."
3. "The Order of the Engineer was initiated in the United States to foster a spirit of pride and responsibility in the engineering profession...and to present to the public a visible symbol identifying the engineer,...a stainless steel ring, worn on the fifth finger of the working hand".
4. Engineering Clinic is a hallmark of Rowan University. Students take a Clinic class each semester, eight total. Many are interdisciplinary. All are hands-on. First-year Clinics focus on engineering's place in society and fundamental engineering skills. Sophomore Clinics merge communication coursework with an engineering design experience and are team taught by engineering, writing arts, and rhetoric faculty. Junior and Senior Clinics give students to work in teams an opportunity to work on research or design projects, usually externally funded.