DR. GALEN TURNER
By Jordan Savoie, Electrical Engineering and Mathematics '23

Dr. Galen Turner was born in California, but since his father was in the military, he didn't spend his childhood in any one place for long. By the time he was four, his family moved to Beeville, Texas; at ten, he moved to Marietta, Georgia; and in his first year of high school, his family moved to Belle Chasse, Louisiana. He graduated with a BS in Mathematics and Religious Studies from Loyola University in New Orleans. While earning his master's degree at Louisiana State University (LSU), he "tried on" teaching and learned he liked it. In his fourth semester, he found a research area that excited him: graph theory. He stayed at LSU and earned a doctoral degree in mathematics while continuing to teach. After a stint at Stephen F. Austin State University in Texas, he came to Louisiana Tech in 2001.

Dr. Turner mostly teaches math—everything from first-year college algebra and calculus to graduate courses in graph theory and cryptography. Recently, though, he taught something seemingly out of left field: Biblical Hebrew. A couple of years ago, a student in his bible study group asked about the names in the Book of Ruth and what they really mean—"Did someone really name their sons Weak and Failing?" This piqued his interest, so he translated the short book, paying attention to what the names meant. Eventually, word of this spread to Dr. Ernest Rufleth, director of Tech's School of Literature and Language, and he asked Dr. Turner to teach an honors Biblical Hebrew class. Despite the misfortune of the first class happening during the quarantine quarter—Spring Quarter 2020—it worked well, and he hopes to offer it again and a similar class focusing on the Book of Psalms later.

In contrast to the 'definition, theorem, example, repeat' routine most professors employ, Dr. Turner always starts with a problem and has his students reason their way to an answer—or at least an attempt at one. This flips the script on its head. Instead of problems existing to justify teaching us this math, we develop this math so we can do something about these problems. Even in his Biblical Hebrew class, he asked the students to bring a short Old Testament passage which they would translate by the end of the course. Instead of going through the sentence structure, conjugations, cases, and vocabulary of the language without ever working with a sample longer than a few sentences, the class focused on understanding the text of the Old Testament—which I suppose is the main reason to learn Biblical Hebrew if you're not a linguist studying Semitic languages.

Although Dr. Turner likes teaching, the reason he pursued a career in higher education was to chase the thrill of conducting research. He is working with several PhD students in the Computational Analysis and Modeling and the Engineering programs and has been the senior investigator on numerous projects funded by departments and institutions within the U.S. government: the National Science Foundation, National Security Agency, Department of Education, Department of Homeland Security, and Air Force.

He's recently toyed with the idea of developing an encryption protocol using graph theory. Encryption is based on having a problem that is easy to put together but hard to take apart. This asymmetry makes tampering with encrypted data practically impossible and is essential to a secure internet. The problem he is considering using is the travelling salesperson problem, usually stated as "What is the most efficient route through each of a list of cities, while only going through each once, and returning to the start?" Trying to compute this is tiring just for several stops, and it quickly becomes more grueling the more you add. Now of course, why should we care about developing new encryption methods when we have perfectly good ones? Well, there's no reason that many of our hard problems will be hard forever. In fact, we already know that most modern cryptographic schemes will be rendered obsolete by quantum computers.

Dr. Turner is active at Temple Baptist Church in the College Ministry and spends his free time with friends, colleagues, and family.