Auburn’s ecological engineering major relies heavily on experiential learning to help students develop engineering and design skills based on fundamental ecological concepts. This semester our students are learning first hand by designing, building, and testing a sustainable habitat for crayfish in the Biological Engineering Research Laboratory. The design project, which is part of the Fundamentals of Ecological Engineering Class (BSEN 5510/6510) taught by Dr. David Blersch, is based on the classic balanced aquarium concept. The project intensifies learning in fundamental concepts of ecological organization and development through microcosm experiences.

**PROJECT GOAL**

The goal of the project is to use principles of ecological engineering to create a closed, balanced ecological microcosm supporting crayfish. Students have been divided into teams and assigned a particular job title and team responsibility. Each team is tasked with designing a tank-based ecosystem that will keep one crayfish alive for at least one week of complete material closure of the tank. Each team is given a tank, one crayfish, and a budget for acquiring additional biotic and abiotic components and energy sources for their tank ecosystems. Student teams are tasked with: 1) determining mass balances of key chemical compounds for crayfish life, and 2) defining monitoring protocols.
for water quality and biotic integrity that relate to aquatic systems health. Several milestones and deliverables have been established to keep the student teams on schedule throughout the semester. A single team of graduate students serves as scientific advisors to the undergraduate teams, providing laboratory and literature research support for the projects. We hope that students will gain a more fundamental understanding of energy and material fluxes in aquatic ecosystems and then use that later in their careers to better inform environmental and ecological engineering decisions.