



# Agricultural STEM Integration Laboratory

## BACKGROUND

- Educators trained in the use of cutting edge technology are essential to develop and maintain a skilled and educated workforce as a vital component for future economic growth in Texas and the nation.
- The educational focus in the US the past several decades has centered on learning knowledge and content without a strong emphasis on application or context. This situation has created a generation of students who lack basic skills in the safe operation of tools and equipment found in the agricultural industry. Students often recognize these deficiencies, but lack the available facilities and mentoring to address them.
- The Agricultural Leadership, Education, and Communications (ALEC) Department, as the largest producer of STEM educators nationwide, is positioned to increase skill attainment and improve the understanding of science, technology, engineering, and math (STEM) principles in their graduates through incorporating project based learning.

## DESIGN AND FABRICATION LABORATORY

This laboratory will provide students with an opportunity to apply concepts and skills in real-world settings. Project design and fabrication educationally serves as the illustration and application of STEM concepts that are usually taught without context throughout the rest of the curriculum.

The Laboratory will facilitate both formal course instruction and project based learning in support of instruction. It will expose students to modern techniques and tools for the design, development, fabrication, and assembly of devices, mechanisms, or products. The Laboratory will be equipped with tools for plastic, wood, and metal forming with modern hand tools, power tools, and numerically controlled equipment. It will contain workstations for small IC engines, hydraulics, and other laboratory exercises on power and energy concepts. Examples include electrical wiring, electrical motors and controls, and renewable energy.

This learning environment will be configured to support a studio model of self-paced, competency-based, project-based learning. Project assignments, tightly integrated into the ALEC course curriculum, will be assigned and students will demonstrate their competency of the necessary skills through the construction of these projects. Appropriate learning resources will be available in the laboratory, tailored to meet the immediate needs of students, providing opportunities to learn and apply skills and techniques. A Director will supervise the Studio and its instructional staff, technicians, and assistants, while maintaining Lab open hours for independent student work.

## BIOLOGICAL AND LIFE SCIENCES LABORATORY

Biological and Life Sciences Laboratory will provide experiential learning opportunities for students to apply STEM concepts that overlap with Animal Science, Horticulture, Plant and Soil Science, and Food Science and Technology. The lab will be equipped with livestock handling facilities, a greenhouse used for teaching greenhouse management in agricultural education programs, a floral and horticulture lab space for demonstration purposes and professional development, and a food science and technology lab to teach food and meat animal safety. The Design and Fabrication and Bio and Life Science labs will be used in providing learning opportunities for both pre-service students and in-service teachers. These facilities may be used by other units within the department, such as Extension, in providing outreach opportunities.

## OUTCOMES

- ALEC graduates will impact thousands of high school students annually when they enter teaching.
- Students will gain practical skills and experiences to better prepare them for industry.
- Professional Development workshops will be offered by the joint faculty to industry and educational audiences.
- FFA and 4-H events, competitions, and educational workshops will be offered in the Studio.

**TOTAL TO FUND AND ENDOW PROJECT: \$6.0 M**

