

A Case for High School Engineering

BY RUSS BYWATER, P.E.



Do you remember the activities of your youth that made you want to become an engineer? Do you think today's young people have similar access to opportunities that will encourage them to study engineering?

As licensed professionals, we want to do all we can to develop the next generation of engineers as well as better informed citizens in our technological society. We need to ensure all our children can actively explore the engineering world from a young age. Then, as they grow into adolescence, we should provide students more advanced opportunities to experience engineering.

The state of Texas has embarked on a new educational path that will help more of our youth discover the profession. Passed by the Texas legislature and signed into law in 2013, House Bill 5 has significantly changed Texas high school graduation requirements. The law provides students with more flexibility to explore one or more educational areas of interest to them.

Students, beginning with the 2014–15 freshman class, are allowed to add an “endorsement” to their diploma in addition to earning credits in the foundation areas. The endorsement areas include STEM, the arts and humanities, business and industry, public services, and multidisciplinary studies.

With help from their parents, counselors, and career interest surveys, students develop a personal graduation plan in the eighth grade to guide their path in high school. Students have flexibility to revise their plan as they discover new interests or reject old ones, but the foundation requirements must still be completed.

This approach encourages students to find and explore areas of interest to them while still in high school. Consequently, high school graduates will be better prepared for life and have a higher likelihood of entering college or the workforce in a field they enjoy.

Centers of career and technology education excellence, such as the Birdville Center of Technology and Advanced Learning near Fort Worth, provide efficient means of delivering advanced courses in the endorsement areas. It may be economically impossible to offer all of a district's students advanced courses in engineering or other career and technology education areas. In one centrally located facility, the school district has consolidated advanced classes in engineering, business, health sciences, education, construction and automotive technology, law enforcement and forensics, cosmetology, agriculture, audio/visual arts, and culinary arts.



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Students from each of the district's three high schools can attend these courses part-time during the day while completing core classes at their home campus. Engineering classes currently offered at the BCTAL include robotics, rocket engineering, advanced computer programming, and the Project Lead the Way courses of Principles

of Engineering, Digital Electronics, and Aerospace Engineering.

High school students gain the opportunity to try engineering, for free, and find out if the career path might be a good fit.

Additionally, students who successfully complete PLTW engineering courses develop a repertoire of work demonstrating their potential in an engineering college curriculum, and are eligible to earn credit at participating colleges and universities.

The programs also provide opportunities for student competition. District robotics students compete against other teams through programs from Boosting Engineering Science and Technology, VEX Robotics, and Skills USA. Preparation for these events is challenging and provides the students opportunities to develop engineering design, manufacturing, project management, and teamwork skills. Living these experiences while in high school also offers the future engineer invaluable preparation for the rigors of a collegiate engineering program.

The new Texas STEM endorsement opens the door for a large, diverse population of potential engineers to try out the profession. Through the endorsement, high school students can discover the fun of the field. Those who decide engineering is not for them will have saved themselves a lot of time and money, but still will become better-informed citizens. Students who wish to continue their engineering education can feel confident that they will be well prepared for college.

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