

# ET DEGREE PAVES THE WAY FOR FLORIDA'S MANUFACTURING WORKFORCE

By Marie Boyette, Marilyn Barger and Bruce Batton

**T**he Engineering Technology (ET) degree program serves Florida's advanced manufacturing industry workforce by providing students with flexible college and career pathways, and employers with a highly skilled and consistently educated workforce. The ET program is unique because it integrates a nationally recognized credential, the Manufacturing Skills Standard Council (MSSC) certification, as part of the college Associate in Science (AS) degree or certificate program.

The ET program provides incumbent workers, veterans, and traditional and non-traditional college students with the ability to earn the MSSC while enrolled in the degree or college credit certificate program, equipping them to more effectively compete for good jobs in industry. Students entering the program already having earned the MSSC may apply their certification toward 15 college credit hours. The ET program is rela-

tively new to Florida, and was approved by the Florida Department of Education (FLDOE) in 2007. Since that time, steady positive growth has taken place in program offerings, student enrollment and interest expressed by Florida colleges and manufacturers, all of which synergize Florida's pipeline to industry.

## The Unique ET Degree

The Florida Advanced Technological Education (FLATE) Center crafted the first-of-its-kind statewide articulation agreement based on the MSSC industry certification. FLATE, working with the FLDOE Career and Technical Education (CTE) team, Florida colleges and Florida industries, defined the new degree program in Engineering Technology to be a program of study which offers a variety of technical specializations sharing a common set of technical college courses. All specializations offered under Florida's

Engineering Technology AS degree use a common curriculum of 18 credit hours:

- (3) Computer-aided Drafting
- (3) Introduction to Electronics
- (3) Manufacturing Materials and Processes
- (3) Mechanical Measurements and Instrumentation
- (3) Quality
- (3) Safety

## ET Core Courses

The core curriculum was developed to be an effective strategy to prepare students to be workforce-ready. Not only does the ET core include knowledge, which representatives from Florida industry have indicated is needed by high-tech employees, but the nationally recognized MSSC certification is embedded into the ET core courses. The statewide articulation agreement provides for the transfer of 15 credit hours toward the ET core for students holding the certification. For students who enter the

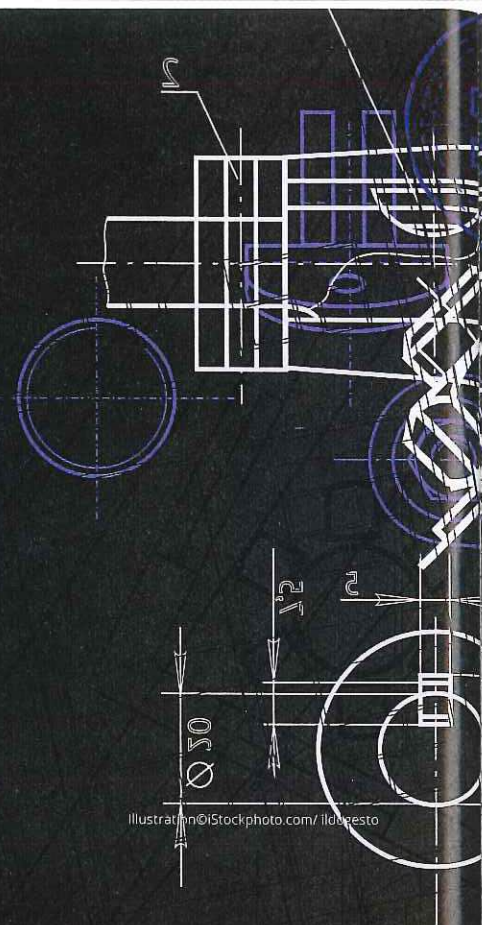


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ET program without having first earned their MSSC certification, the ET core courses prepare students to pass the series of MSSC examinations. Students enrolled in the ET program have the ability to complete their degree and earn the value-added certification.

In Florida, manufacturers are beginning to list the ET degree as a preferred credential when they hire technicians. Mike Ennis, a Florida manufacturing engineer who manages environmental health and safety at Harris Corporation, says that his company "values ET degree program graduates. The knowledge they gain from classes and the experience they gain in the lab gives them a thorough understanding of the subject matter. They come to the manufacturing floor with a higher level of confidence and self-assurance."

### Jump Start Toward a High-tech Career

To ensure that secondary students have a viable entry path to the college and career pipeline for the advanced manufacturing industry, a new curriculum framework for secondary students, the Automated Production Technician (APT), was approved by the FLDOE in January 2009. The goal of the APT framework is to support, sustain and streamline the pathway toward the Engineering Technology AS program. The APT (with embedded MSSC) program is available for implementation by Florida high school programs, career

academies and technical schools. Secondary school students earning the MSSC as part of their programs of study earn 15 college credit hours toward the ET program offered at half of Florida's state and community colleges. This combination allows secondary students to be better equipped upon graduation from high school for finding good jobs due to holding a valuable industry-recognized certification, in addition to getting a significant jump start on a college degree with 15 credit hours.



For adult learners, postsecondary/adult vocational (PSAV) programs, which align with the MSSC Certified Production Technician (CPT), were developed. The program provides an experiential pathway where incumbent workers have the opportunity to gain the 15 college credit hours through MSSC certification. Veterans in the program have shared that the program is a good match for many of the hands-on skills learned through military service.

The ET program allows “stacking” of credentials and experience leading to enhanced career potential with Florida advanced manufacturers, as well as with related high-tech industries throughout the state. But the road does not end here! Engineering Technology AS degree holders can transfer seamlessly to a number of Bachelor of Applied Science (BAS) degrees offered in Florida’s universities and colleges. Students apply the 60 credit hours of an AS degree in ET directly toward the four-year BAS degree. The Bachelor of Science in Engineering Technology (BSET) at Daytona State College provides another option: The BSET program is primarily online (additional general education credits and technical prerequisite courses may be required).

### Dual Enrollment for High School Technology Programs

Florida employers have articulated employee skill sets which are needed to support the state’s manufacturing and high-tech industries; engaging high school students in technology programs leading to college and careers in Florida’s high-tech industries is needed. Dual enrollment for high school students in technology programs is a step in the right direction, and such programs are on the rise thanks to the interest shown by local industry and college partners. While instructor credentialing is a factor for teaching college-level courses in high school, a credentialed community or state college

faculty member may teach on site at the secondary institution, or college high-tech laboratory facilities may be shared.

In another example, the goal of the Students in Engineering Technology (SET) project is to address employers’ needs by producing highly skilled and educated technicians who are prepared to enter and succeed in the field of Engineering Technology. A strong, community-based partnership between education and industry is planned to achieve this goal. The SET project is led by Tallahassee Community College (TCC), which makes use of their expertise in high-tech teaching and training by working with local area high schools. This project examines the instructor’s perspective as an integral part of the project, e.g., what are the challenges to an ET instructor (high school and college) to relate concepts to real-world applications, incorporating practical contextual teaching for greater student understanding and success?

### Engaging Educators

Teacher engagement is critical to building and supporting effective college and career pathways. Feedback from educators and industry highlights a gap in providing professional-development opportunities for technical faculty to develop, refine or certify their knowledge base within advanced manufacturing and its related technologies. Along with a lack of professional-development opportunities for educators in technical areas, curriculum and

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career materials available for secondary, postsecondary and adult education for technology and engineering (the “T & E” sides of science, technology, engineering and math (STEM)) are not as abundant as are materials for science and math topics. Professional-development opportunities, as well as free, online curriculum, help educators fill this gap. Teachers adding to their CTE toolkit are better equipped to support students as they consider and explore pathways to rewarding careers.

Aspects which are critical to address with high school students in order to effectively supply tomorrow’s technology workforce include:

- Student engagement
- Practical understanding of manufacturing technologies
- Working with real equipment
- Internships
- Mobility, pay, job opportunities
- Industry trends
- Technology trends
- Generational/cultural differences
- Site visits/guest speakers
- Facebook/social media

Workshops designed to help teachers better prepare their students for careers employing advanced technologies, hands-on workshops addressing high-tech topics such as mechatronics and 3-D modeling, along with online materials and STEM resources, provide support for educators.

Resources, such as complete “industry-



connected” lesson plans and interactive high-tech career pathways, provide scaffolding for professional development with collateral materials promoting a positive awareness of technical college and career pathways. Such resources help educators provide guidance about the educational choices needed to obtain these careers, and help strengthen the pipeline for high-tech careers.

CTE initiatives in Florida are evolving to address, as well as stimulate, a growing interest in CTE. Dual-enrollment programs, professional development for technical educators, STEM curriculum, and learning objects that focus on technology and engineering are helping to engage the tech-savvy generation of students.

## Florida Colleges Support Florida's Manufacturing Initiative

Developing a uniform system for manufacturing education among the two-year colleges in Florida was an early goal for the ET program because colleges were operating in silos rather than collaborating, and students and employers were confused by the lack of coordination among the colleges. Students had difficulty transferring credits because the programs used different course names and numbers; employers were unsure what skills students had acquired.

Now, thanks to the coordinated effort supporting Florida's Engineering Technology degree, 11 Florida state and community colleges were included on the Manufacturing Institute's "M-List." Three Florida colleges were too new to the ET program to qualify. The M-List recognizes institutions offering the opportunity of earning credentials that align with the National Association of Manufacturers' (NAM) endorsement of the MSSC. Only 16 states made the charter M-List in 2013, and most of the states have only one or two colleges with curricula and credentials aligned to NAM's expectations.

As of November 2013, the ET degree

supports a wide range of manufacturing and high-tech industries, and this interest is reflected in the number of adopting colleges and in the number of specializations and college credit certificates offered, all of which demonstrate a positive trend.

The ET program has been adopted by 14 of Florida's 28 state and community colleges. The college network aids in transferability among institutions. For ET students, college credits are easily transferrable among participating Florida colleges since the degree shares a common core curriculum. This important aspect of the degree program provides further flexibility to pursue careers in industry around the state, and enhances the college-to-career pipeline for advanced manufacturing and its related industries statewide. Student enrollment exhibits a consistent, positive trend.

## Impact

An educational model to support Florida's need for a growing advanced manufacturing workforce was articulated at the state level, in addition to being a recognized need for the high-tech workforce nationwide. The ET program provides a variety of flexible entry points for college and career pathways to success. The program's statewide agreement, based on an industry certification, has been a model for other CTE programs in Florida, as well as other states. Impact includes the development of advanced manufacturing college and career pathways which provide access to an increasingly diverse population of students entering the program. Targeted outreach to underserved populations, women and returning military is intended to grow participation for traditional-age students and for adult learners. Potential employers are connected to the educational program by engaging in continued input to educators, both locally and at the state level through active advisory committees,

and providing job opportunities for program graduates. Partnerships between educators and employers statewide create synergy and systemic educational change, and lead toward career pipeline sustainability. ■

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