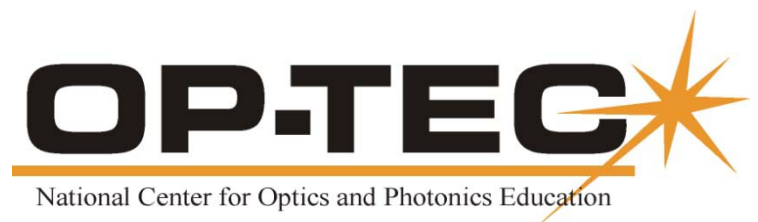


# Restoring a Declining Photonics Program at Tri-County Technical College

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# **RESTORING A DECLINING PHOTONICS PROGRAM AT TRI-COUNTY TECHNICAL COLLEGE**

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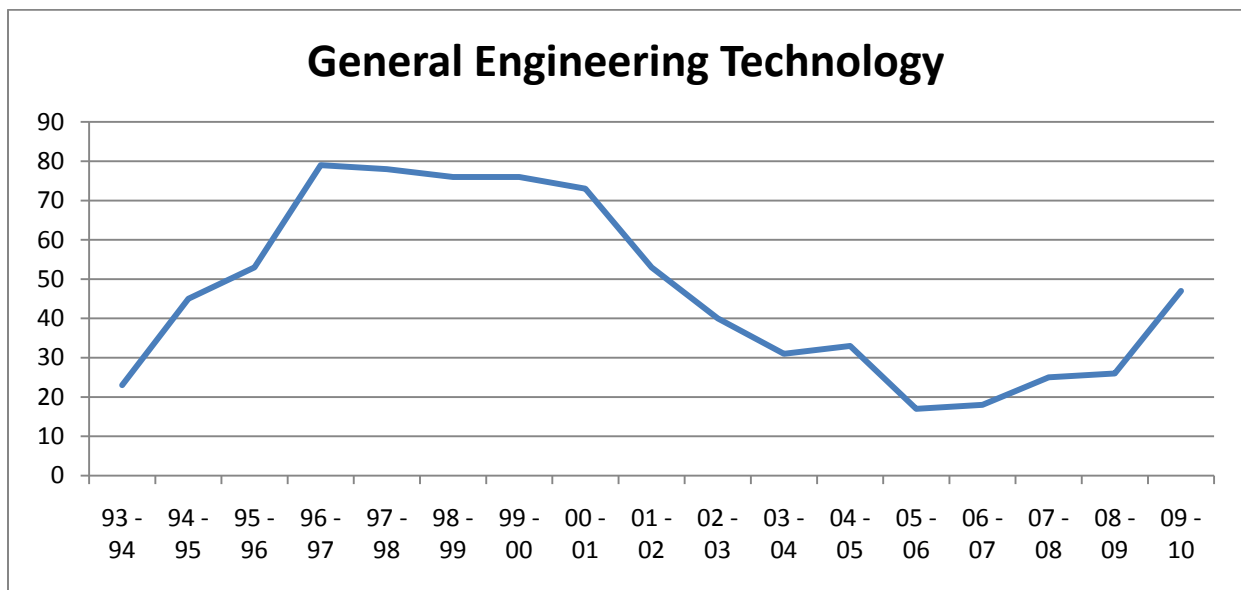
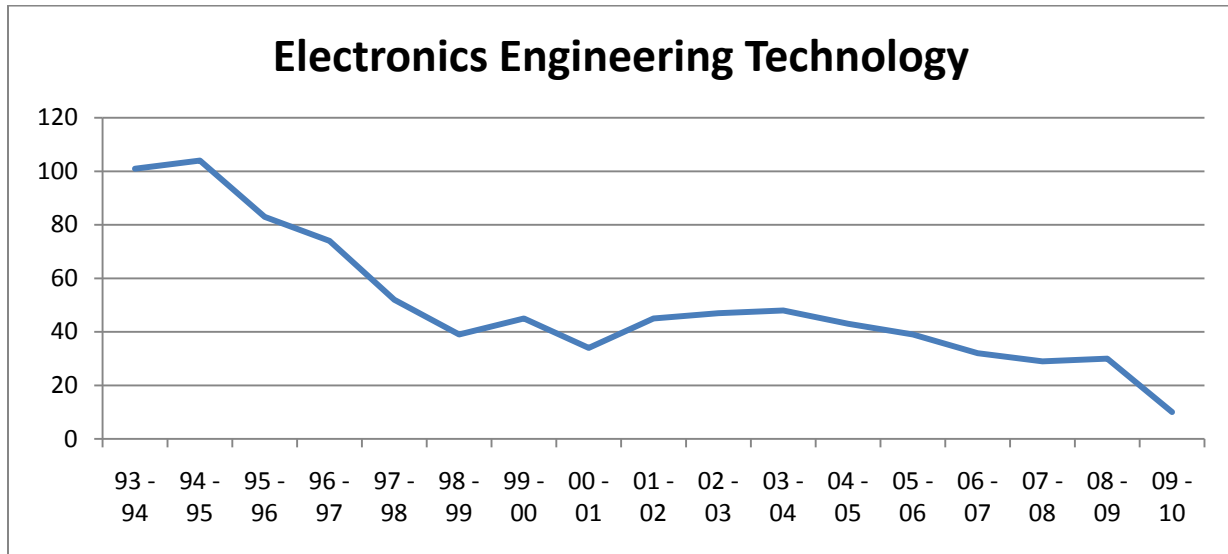
## **Background and Purpose**

Tri-County Technical College, one of the largest of the 16 colleges in the South Carolina Technical College System, has grown into a comprehensive two-year community and technical college that serves approximately 7,250 students from Anderson, Oconee, and Pickens counties in more than 70 major fields of study. Located in the foothills of the Blue Ridge Mountains, the College has campuses in Pendleton, Anderson, and Seneca, with an additional campus slated to open in Easley in 2010.

The Electronics Engineering Technology (EET) and General Engineering Technology (GET) programs both began over 25 years ago. The curriculum for these two programs included topics on laser applications and the use of optics. The EET program focused on microprocessor application and design. The GET program was an electro-mechanical program designed to support the local manufacturing base in the three-county area.

## Program Decline

Beginning in the 1990s, both programs experienced a steady decline in enrollment.



The enrollment decline can be attributed to 3 major factors:

1. Both programs became *outdated*. The equipment and curriculum needed to be updated and in some cases replaced with current topics and technology.
2. The second factor was the *lack of faculty development*. As time passed and industry needs changed, the faculty did not maintain their level of competence in emerging technologies.

3. The third and last factor was *poor marketing* of the programs and the *lack of a pipeline* to maintain enrollment.

In 2005, the programs had a total of 3 fulltime faculty with 58 students in the system. In reality, the class enrollment was averaging 6 students per class. Also in 2005, the EET program was on probation due to a lack of graduates. It was decided at that time to close the EET program and focus on restoring the GET program. The EET program was terminated in 2008.

## **Decision to Restore the Program**

The General Engineering Technology employer advisory committee was adamant about resurrecting the program to provide the needed multi-skilled technicians. And they recommended that the program be updated to include robotics and photonics courses. The Industrial & Engineering Technology Division Dean was committed to redesigning and growing enrollment in the program. All of these factors lead to the decision to put the necessary resources in place to insure a successful restoration of the GET program.

The I&ET Division Dean presented the restoration plan to the Vice President of Academic Affairs. Once the plan was approved, the faculty and staff began to execute the plan.

## **Plan to Restore the Program**

The plan to restore the GET program addressed the 3 major factors listed above:

1. The first factor that needed to be address was *outdated equipment and curriculum*. Based on the feedback from the GET advisory committee, it was clear that robotics and photonics should be the focus of the program. Thus, the I&ET Division Dean applied for a \$150,000 *AdvanceSC* grant to fund a Computer Automation & Robotics System's laboratory & curriculum. The grant was received, enabling Tri-County Technical College to purchase 4 industrial robots and develop several courses to provide the students with the necessary skills needed to utilize and maintain the robots.

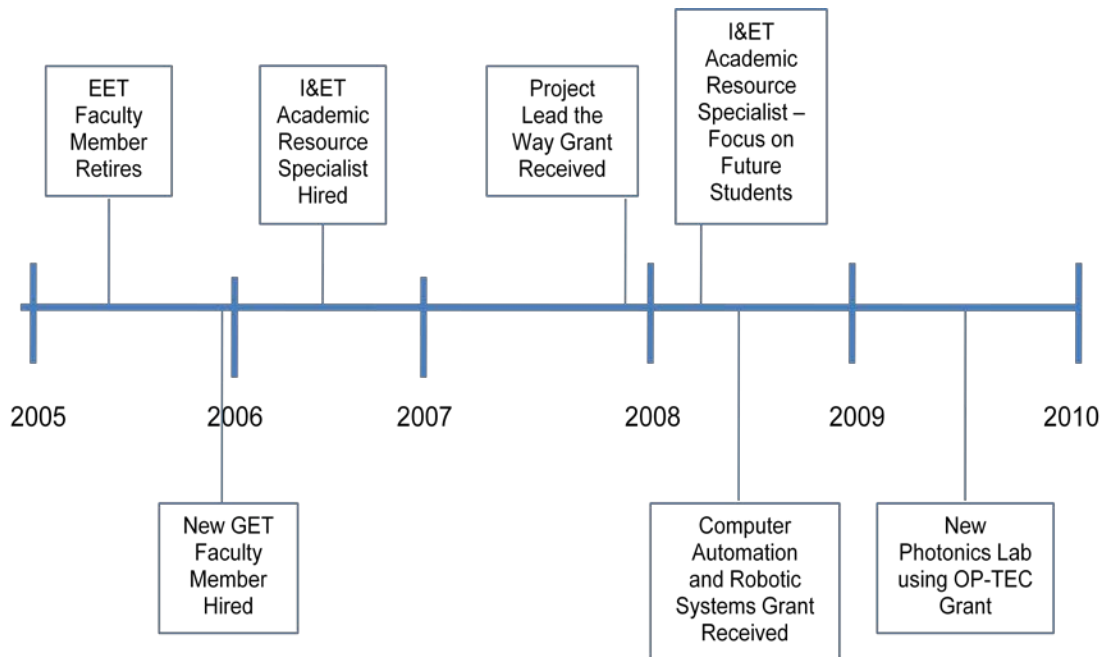
With the financial support and help of OP-TEC, the faculty was able to offer OP-TEC's photonics course and purchase needed equipment to support the instruction. The college provided additional space, which was converted to a lab for the instruction of lasers and their applications. This enabling technology (photonics) is critical for our local manufactures.

2. The second factor of faculty development was addressed through several avenues. The first change occurred with the retirement of an EET faculty member in 2005. The two departments were restructured organizationally. The present GET faculty member was reassigned and eventually retired. A new faculty member was assigned to the GET program and began making the needed changes. OP-TEC also provided professional development opportunities during this phase to retrain the faculty member in photonics.

The excitement and energy were key factors to the restoration of the GET program. The selection and hiring of this faculty member, with the skills and motivation needed to bring the program back, was instrumental to a timely recovery. When the new faculty member

was hired the GET program had 19 students enrolled. The 2009 fall enrollment was 49 students. The program continues to experience a steady growth rate.

3. The third factor was marketing and insuring a pipeline of students was readily available. The I&ET Division Dean obtained a \$250,000 *AdvanceSC* grant to fund the college's partnership with local high schools that had implemented "Project Lead the Way" (PLTW). Since most of the High Schools and Career Centers in the 3 county service areas already had PLTW programs, it was important for Tri-County Technical College to insure a seamless transition by creating a pull system. The core courses for PLTW are now entry level courses within the General Engineering Technology degree program. High School students who complete the PLTW program at their high school can earn credits in our HS pipeline for the GET program. This articulation and partnership has been critical to creating the pipeline. The grant allowed the program to purchase new equipment to support the fundamental classes, as well as, offer summer camps to middle school and high school students. The other major initiative was hiring an academic advisor to support the I&ET students. This position works with future students by making sure their academic plans are seamless during their transition from high school to college. The position also supports existing students by coordinating tutoring services.



## Today's Program

The GET program is a 75 credit hour associate degree program. The program prepares a student to be a multi-skilled technician. Embedded within the program is the PLTW curriculum. Besides the typical electro-mechanical focus, the students are prepared to support various lasers within the manufacturing environment. They also learn to program and maintain robots. In 2009 we added OP-TEC's course #1, *Fundamentals of light and Lasers*. One of the capstone projects in

the program has the students designing a light show with lasers and using the robots to create the movements. In 2011 we plan to add the second OP-TEC course, *Elements of Photonics*.

The enrollment for fall 2010 has exceeded 55 students. This is a 17% increase in enrollment over fall 2009. Most importantly, we are increasing the number of graduates, to support the needs of our local manufacturing industry partners. They can now find qualified technicians in the local area.

We plan to continue and grow to our partnerships with local high schools and career centers. We also hope to offer some teacher development activities for this coming year. TCTC's faculty believe if we can strengthen the relationships with the high school and career center teachers, we can pull more students into the program.

Another plan for the future is a hybrid evening program offering. With the help of OP-TEC, the faculty hopes to implement this new program in the fall 2011.

## **Lessons Learned**

The situation did not improve over night, but *persistence* was needed to effectively restore this declining program. The greatest lesson learned is *having the right people in the right position*. If you have the right faculty in the job, they only need the time and resources to help fix the problem.

The faculty could not have moved as quick without the help of OP-TEC. OP-TEC's curriculum and technical support was critical in creating our photonics course. The partnerships with other OP-TEC colleges were also key in making improvements. For example, the curriculum and pipeline initiatives Indian River State College put in place was a valuable and useful model we used for turning our program around.