

# White Paper

## **CTEF ITC<sup>®</sup>**

**Career Technical Education Foundation  
Innovation & Training Center<sup>®</sup>**

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## CTEF ITC<sup>®</sup>

### Overview

CTEF ITC<sup>®</sup> is an acronym that means **I**nnovation & **T**raining **C**enter, an educational model designed by Career Technical Education Foundation (CTEF) to enable students to experience rigorous, engaging, relevant, and most importantly, sustainable educational programs oriented to employers in their region. Rooted in the precepts and successful implementations of the dual educational strategy first implemented in Florida by CTEF as its “Footprint of Sustainability,” the vision for CTEF ITC<sup>®</sup> is to be the definitive model in the country for coalescing business and education in a relevant and productive environment.

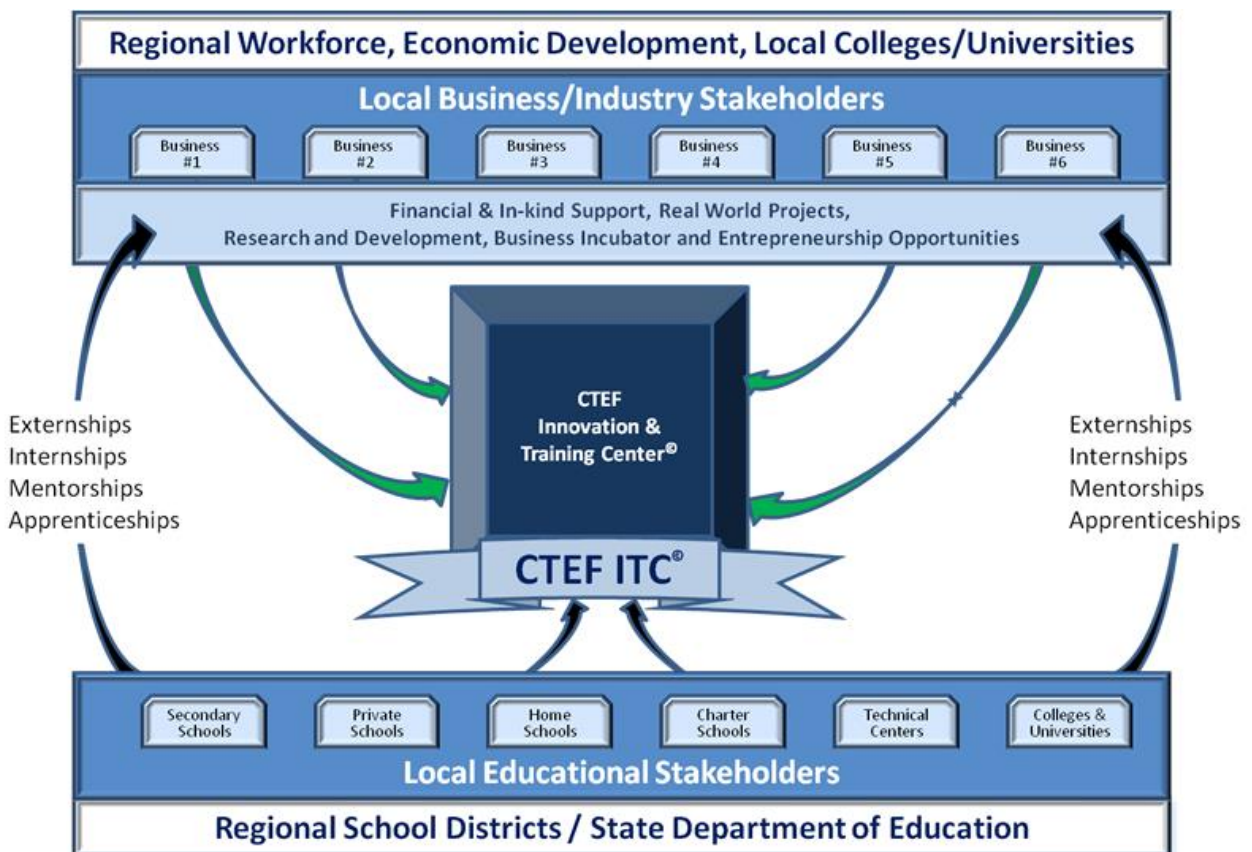


Figure 1. Overview of CTEF ITC<sup>®</sup>

The uniqueness of CTEF ITC<sup>®</sup> lies in many of its features, but primarily because it collectively represents a significant departure from conventional training centers in organization, curriculum, and instructional strategies.

### CTEF ITC<sup>®</sup> - The Organization

Unlike conventional technical education centers, a CTEF ITC<sup>®</sup> receives support directly from a myriad of stakeholders in the region, including business and industry; school districts, colleges, and universities; and governmental agencies charged with workforce and economic development in the region.

### Stakeholder Relations

Stakeholders from business, industry, colleges, and universities provide CTEF ITC<sup>®</sup> students with real world projects and problems to solve as well as opportunities for internships, mentorships, and apprenticeships. A unique aspect of CTEF ITC<sup>®</sup> is that these same stakeholders provide the impetus and the means by which students pursue research and development, business incubation, and entrepreneurial opportunities.

### Support

Support for the CTEF ITC<sup>®</sup> is provided by workforce and economic development entities as well as colleges, universities, and business. This support might take the form of financial, in-kind contributions such as materials, equipment, or space, et al, or a combination.

### Students

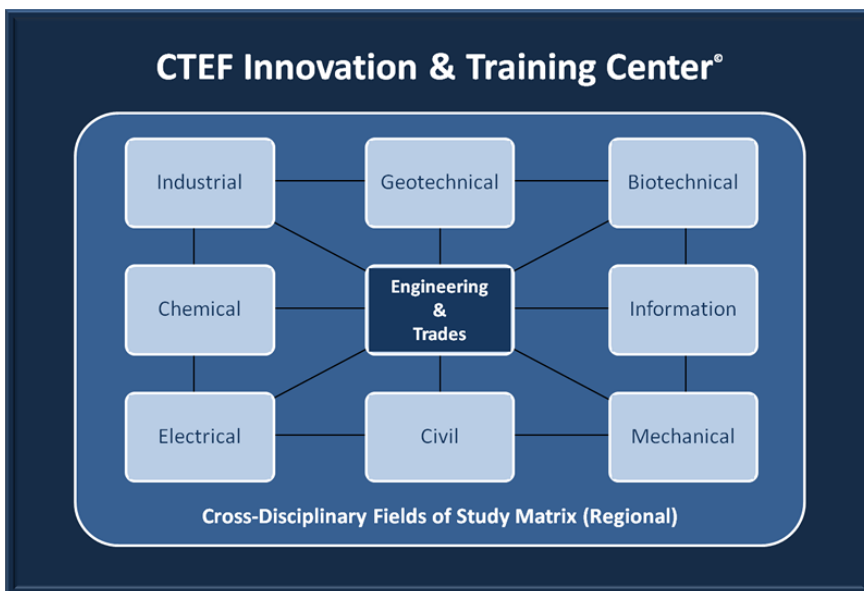
The primary source of CTEF ITC<sup>®</sup> students is public, private, and charter schools operating under the auspices of or within the boundaries of the local school district(s) or college/university. The vast majority of students attending the CTEF ITC<sup>®</sup> will be secondary students (9-12) who attend on a dual enrollment basis from their parent school. Students may also originate from other technical centers and local colleges through co-location and articulation agreements.

### **CTEF ITC<sup>®</sup> - The Curriculum**

Unlike conventional technical education centers, CTEF ITC<sup>®</sup> provides curriculum organized into academies founded on a matrix of regionally relevant fields of study, with a highly rigorous technical core foundation suitable for engineering or technician-bound students.

### Cross-Disciplinary Fields of Study Matrix

Among the many features that set CTEF ITC<sup>®</sup> apart from the many technical training centers is the chameleonic benefits derived from the cross-disciplinary fields of study matrix as an instructional system. As illustrated in Figure 2, each CTEF ITC<sup>®</sup> site features curriculum



organized as academies tailored to support the workforce and economic development needs of the region. The fields of study comprising a CTEF ITC<sup>®</sup> suite of academies would be determined by the regional stakeholders.

At the heart of the matrix is the core foundation made up of science, technology, engineering, and mathematics (STEM) knowledge and skills fundamental to the associated fields of study.

Figure 2. Cross-Disciplinary Fields of Study Matrix

### Chameleonic Features

The truly unique feature and value of the cross-disciplinary fields of study matrix rests in its ability to transform according to regional needs, very much like a chameleon alters its appearance based on its surroundings. Figure 3 illustrates how associated fields of study are blended with the core to achieve a cross-disciplinary academy based on an occupational or educational goal related to robotics and automation.

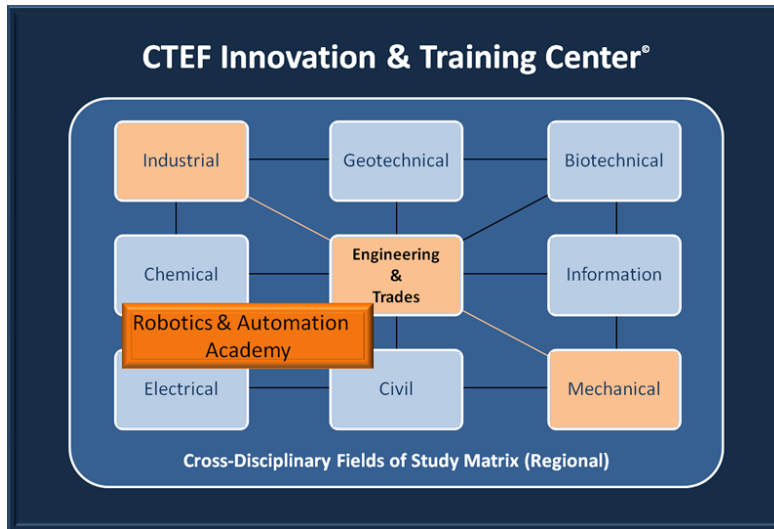


Figure 3. Robotics & Automation Academy Matrix

In this particular academy, courses spanning industrial and mechanical engineering are coupled with the core engineering and technical skill courses and projects to provide a continuum of learning incidents for students desiring to pursue a career in robotics and automation. This same academy might also have an aerospace field of study if the CTEF ITC<sup>®</sup> site was located in a region with cluster industries supporting the aerospace industry.

With the field of robotics and automation spanning so many industries, such an academy

might also serve the entertainment industry and theme parks important to Florida through curriculum expansion into animatronics and simulation, including motion capture technology.

In another example, Figure 4 shows how the cross-disciplinary fields of study matrix would accommodate students desiring to pursue a career related to the alternative power industry.

In this particular academy, students would receive instruction and work on real world projects related to the fields of geotechnical, civil, and electrical engineering. Again, depending on the location of the CTEF ITC<sup>®</sup> the actual fields would be tailored to support regional needs and initiatives. In this case, the alternative power source (e.g., solar, biomass, wind, nuclear, et al) important to the region would drive the focus of instruction.

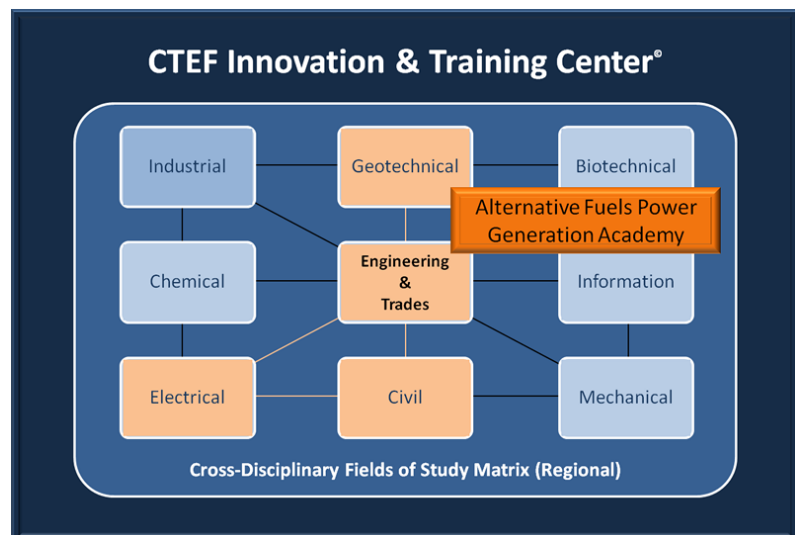


Figure 3. Alternative Fuels Power Generation Academy Matrix

In those regions having a strong economic development interest or industry clusters associated with the medical or biotechnical

industries, a CTEF ITC<sup>®</sup> academy profile for a prosthetic engineering career path. The matrix shown in Figure 5 illustrates the flexibility the CTEF ITC<sup>®</sup> model of instruction.

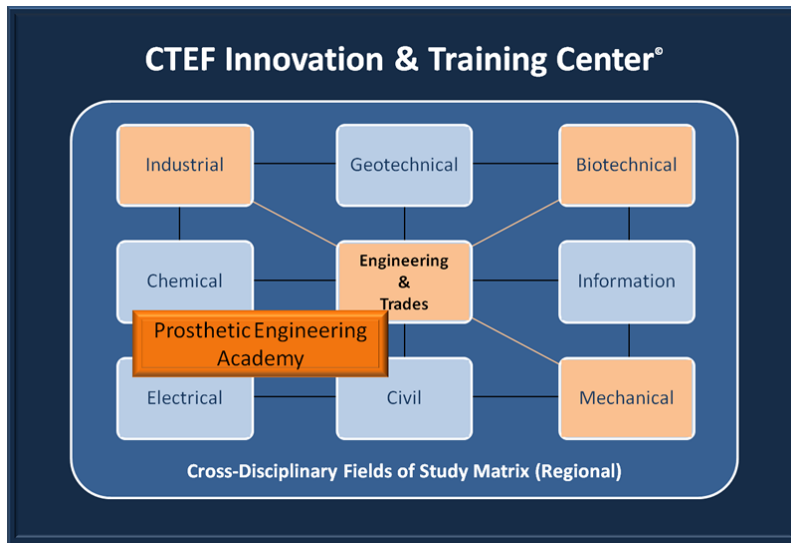


Figure 5. Prosthetic Engineering Academy Matrix

Students in a CTEF ITC<sup>®</sup> Prosthetic Engineering Academy would receive instruction in industrial, biotechnical, and mechanical fields of study, coalesced with the engineering and trades core. As with other CTEF ITC<sup>®</sup> academies, the matrix could expand to allow more specialized studies depending on location. For instance, a CTEF ITC<sup>®</sup> site located near a major medical research center might expand the curriculum to support advanced orthotics, including biomimetic implants and neural prosthetics.

### CTEF ITC<sup>®</sup> - The Instruction

In spite of the significant and unique CTEF ITC<sup>®</sup> Cross-Disciplinary Fields of Study Matrix model for offering curriculum, it is further strengthened by the instructional philosophies, strategies, and underpinnings that come into play once operationalized.