Texas State Technical College Harlingen
Industrial Systems Technology Certificate
A Competency Based Model

SUMMARY

Under the framework of the existing Mechatronic Technology Associate of Applied Science degree (AAS), Texas State Technical College (TSTC) Harlingen and business stakeholders, represented by the Texas Association of Manufacturers, have developed an Industrial Systems Technology Level 1 Certificate curriculum. This certificate is delivered through TSTC Harlingen's Competency Based model that focuses its milestones on skills attainment and assessed learning outcomes rather than contact hour completion. The learning outcomes in the Industrial Systems Technology Certificate are identical in scope and detail to the corresponding courses in the Mechatronics Technology AAS. The course learning outcomes and credit hour ranges are established by the Texas Higher Education Coordinating Board and published in their Guidelines for Instructional Programs in Workforce Education (GIPWE) for degree credit (SCH).

Industrial Systems Technology Certificate (Fall 2013)

Semester 1	SCH
CETT 1303 DC Circuits	3
ELMT 1305 Basic Fluid Power	3
CETT 1325 Digital Fundamentals	3
INMT 1319 Manufacturing Process	3

Semester 2	SCH
CETT 1305 AC Circuits	3
INTC 1341 Principles of Automation Control	3
ELMT 1301 Programmable Logic Controllers	3
INMT 1317 Industrial Automation	3
EECT 1307 Convergence Technologies	3
Total	27

Mechatronics Technology AAS (Fall 2013)

Semester 1	SCH
CETT 1303 DC Circuits	3
MATH 1314 College Algebra	3
RBTC 1305 Robotics Fundamentals	3

Semester 2	SCH
CETT 1305 AC Circuits	3
CETT 1325 Digital Fundamentals	3
INMT 1317 Industrial Automation	3
CHEM 1311 General Chemistry	3
CHEM 1111 Chemistry Lab	1

Semester 3	SCH
ELMT 1301 Programmable Logic Controllers	3
ELMT 1305 Basic Fluid Power	3
ELMT 2333 Industrial Electronics	3
ENGL 1301 Composition I	3

Semester 4	SCH
ELMT 2339 Advanced PLCs	3
INTC 1341 Principles of Automation Control	3
MCHN 1338 Basic Machine Shop I	3
Social/Behavioral Science Elective	3

Semester 5	SCH
EECT 1307 Convergence Technologies	3
FCEL 1305 Intro to Fuel Cell Technology	3
Speech Elective	3
Humanities/Fine Arts Elective	3

Semester 6	SCH
ELMT 2341 Electromechanical Systems	3
ELPT 2231 AC/DC Drives	2
INMT 1319 Manufacturing Processes	3
QCTC 1301 Total Quality Management	3
Total	69

TSTC Harlingen utilized the Detailed Work Activities Regional Analysis Model, developed in partnership with the Texas Workforce Commission, to develop the curriculum with its industry stakeholders. This process identifies the detailed work activities that an employee would perform in a specific job, allowing for comparison of these activities with learning outcomes to be offered in the curriculum. These learning outcomes were then mapped to the related THECB course inventory, so when a student demonstrates their attainment of necessary skills, the course is permanently recorded on their TSTC Harlingen transcript. This promotes continued advancement through lifelong learning, and it facilitates an individual's mobility through the Texas higher education system to Associate's, Bachelor's, and graduate degrees. Additionally, this administrative mapping process to record credit hours allows a student to receive financial assistance through state and federal sources to fully pursue their education.

Utilizing learning activities that closely model the employers' environments, TSTC Harlingen teaches skills based on a student's individual learning style and pace, rather than semester contact hour formulation, and well-defined rubrics are used to assess the skills attainment as a student advances through the certificate. Upon mastery of a skill, the student learning outcome is assessed and documented, and under the guidance of TSTC's faculty, the students progress to acquire the next learning outcome, thus building upon their skill base. In the project-based environment, the students' schedules are established in a block format that promotes greater learning retention rather than the traditional Monday-Wednesday-Friday/Tuesday-Thursday schedule. Based on employer and student need, schedules are developed for full-time and part-time students, incorporating evening sessions as well. Rather than pursuing the completion of a contact hour semester, the program's design promotes the student's goal of skill attainment and job competency, and the student works toward achieving those skills rather than simply attending classes.

The Industrial Systems Technology Certificate is also fully integrated into TSTC Harlingen's Institutional Effectiveness processes, including student learning outcome assessment, program review, administrative outcomes, and strategic planning. Existing, dedicated lab space and equipment have been scheduled to conduct the instructional activities, and TSTC Harlingen provides more instructional time per course in the Competency Model than is available in the traditional semester schedule. Qualified faculty in the Mechatronics Technology program will teach all courses in the Industrial Systems Technology Certificate, and additional faculty may be added as the program grows.