ADVANCED MANUFACTURING TECHNOLOGY

The Advanced Manufacturing Technology program is first in the State of Texas to gain accreditation through the National Institute for Metalworking Skills (NIMS).

The National Institute for Metalworking Skills (NIMS) is the nation's only ANSI accredited developer of precision manufacturing skill standards and competency assessments. NIMS certifies an individual's skills against standards and accredits programs that meet their quality requirements. NIMS stakeholders represent over 6,000 American companies.

The Precision Manufacturing Certificate program, provides an environment to develop technical skills that are highly marketable to the area's industries. Most of the courses are set up to simulate actual working environments.

Technical coursework begins in the first semester in order to develop a common skill base for the program. During their first semester a student will gain the knowledge necessary to interpret industrial prints, operate machine tools, and utilize software to program Computer Numerical Controlled (CNC) machines.

Precision Manufacturing Technology

Certificate

This curriculum offers training on a variety of advanced machining technology commonly used in machine shops and focuses on developing practical machining skills. Classroom analysis of various jobs and machine operations increases the student's capabilities as a machinist. General mathematics and communications skills are included to prepare students to work with technical advances in the machining industry.

Students are eligible to take the National Institute of Metalworking Skills (NIMS) certification exams, which are administered at South Texas College by certified faculty. Upon completion, this specialty will allow the student to continue in the Advanced Manufacturing Technology's two-year Associate of Applied Science Degree program or permit the student to work in a highly rewarding career field.

Precision Manufacturing Technology

Associate of Applied Science

This degree is designed to provide students with the opportunity for hands-on experience necessary for employment as a machine operator, with a focus on computer enhanced manufacturing processes. Through the integration of mathematics, metallurgy, programmable machinery, shop skills, and computer-assisted machining techniques, students can acquire the necessary skills for employment in an industrial environment. Graduates are eligible to take the National Institute of Metalworking Skills (NIMS) certification exams, which are administered at South Texas College by certified faculty.

Technical coursework includes: machine tool operation, Computer Numerical Control (CNC) programming and operation, parametric solid modeling, and material testing. Specialty coursework includes: Computer Aided Drafting (CAD), Computer Aided Manufacturing (CAM), tool and fixture design, and multi-axis machine programming.

Mechatronics Technology Specialist

Certificate

This specialization is a blend of mechanics and electronics. Mechatronics implements techniques in robotics, controls theory, computing architecture and electronics technology. This program will prepare students with the hands-on training they need to work in this industry. Graduates may find employment as technicians assisting engineers.

Program Learning Outcomes

Precision Manufacturing Technology Certificate

1. Students will be able to interpret the fundamentals of Cartesian coordinates, the G & M code system, and how they apply to CNC machining and setup.

2. The student will be able to properly interpret prints by understanding dimensions, tolerances, sectional views, orthographic projections, and auxiliary views.

3. The student will be able to evaluate shop and personal safety hazards common to the workplace, machine workpieces using the vertical mill and lathes equipment.

Precision Manufacturing Technology Associate of Applied Science

1. Students will be able to utilize the proper tools and procedures to operate and set up a trainer plastic injection molding machine.

2. Students will apply civil drafting fundamentals in the development of various civil engineering-related projects.

3. Students will be able to complete a design project using CAD/CAM software and advanced machining techniques.

4. The student will be able to perform machining operations according to specifications and given tolerances.

5. Students will apply Computer Aided Manufacturing (CAM) software in conjunction with CNC machinery to produce machined components.

Mechatronics Technology Specialist Certificate

1. Students will demonstrate knowledge of numbering systems, tags, switches, timers, counters, relay and ladder logic used in a programmable logic controllers.

2. Students will demonstrate knowledge of basic fluid power theory, component operation and demonstrate fluid power circuits using electrical and manual controls.

3. Students will use teach pendants to program robotic arm, identify different types of robot control systems, and end-of-arm tooling.

Advisory Committee Members

Advanced Manufacturing Technology & Mechatronics

Advisory Committee Chair – Timothy Andre Jones, Mfg. Engineering Manager, Cinch Connectivity
Cliff Mahathey, Director of Operations – EMU Plastics
Cesario Pina, Plant Manager – Regal Rexnord, Inc.

Lutz Blume, Co-Owner- Priority Tooling Solutions, US Inc.
Mike Willis, South Texas Manufacturers Association.
Samuel and Norma Torres, Owners, Amaida Machine Shop.

Robinson, Plant Manager - Grand Rapids Foam Technology.
Juan Luna, Engineering Manager - General Electric Aviation.
Inez Lopez, Co-Owner - IHC Suspension.
Horacio Salinas, Machining Operations Manager - IHC Suspension.
Pedro Garcia, Co-Owner - B1nary Technologies.
Lorenzo Derbez, Machining Operations Manager - Galvotec Alloys Inc.

Certificates

- Precision Manufacturing Technology Certificate (p. 2)
- Mechatronics Technology Specialist Certificate (p. 2)

Associate Degree

- Precision Manufacturing Technology Associate of Applied Science (p. 2)

Precision Manufacturing Technology Certificate

TSI EXEMPT

Course	Title	Credit Hours
Fall		
DFTG 1325	Blueprint Reading and Sketching	3
MCHN 1338	Basic Machine Shop I	3
MCHN 1320	Precision Tools and Measurement	3
MCHN 2303	Fundamentals of Computer Numerical Controlled (CNC) Machine Controls	3
	Credit Hours	**12**
Spring		
DFTG 1313	Drafting for Specific Occupations	3
MCHN 1343	Machine Shop Mathematics	3
MCHN 1326	Introduction to Computer-Aided Manufacturing (CAM)	3
MCHN 1352	Intermediate Machining I	3
	Credit Hours	**12**
	Total Credit Hours	**24**

Mechatronics Technology Certificate

TSI EXEMPT

Course	Title	Credit Hours
Fall		
RBTC 1405	Robotic Fundamentals	4
CETT 1409	DC/AC Circuits	4
ELMT 1405	Basic Fluid Power	4
RBTC 1401	Programmable Logic Controllers	4
	Credit Hours	**16**
	Total Credit Hours	**16**

Precision Manufacturing Technology Associate of Applied Science

TSI LIABLE

Course	Title	Credit Hours
First Year		
Fall		
DFTG 1325	Blueprint Reading and Sketching	3
MCHN 1338	Basic Machine Shop I	3
MCHN 2303	Fundamentals of Computer Numerical Controlled (CNC) Machine Controls	3
MCHN 1320	Precision Tools and Measurement	3
	Credit Hours	**12**
Spring		
DFTG 1313	Drafting for Specific Occupations	3
MCHN 1343	Machine Shop Mathematics	3
MCHN 1352	Intermediate Machining I	3
MCHN 1326	Introduction to Computer-Aided Manufacturing (CAM)	3
	Credit Hours	**12**
Summer		
ENGL 1301	Composition I [1]	3
SPCH 1311	Introduction to Speech Communication [1]	3
Social and Behavioral Sciences Elective [1]		3
	Credit Hours	**9**
Second Year		
Fall		
MCHN 2447	Specialized Tools and Fixtures	4
MCHN 2435	Advanced CNC Machining	4
MCHN 2341	Advanced Machining I	3
Humanities Elective [1]		3
	Credit Hours	**14**
Spring		
MCHN 1319	Manufacturing Materials and Processes	3
Math and Natural Sciences Elective [1]		3-4
MCHN 2438	Advanced Computer-Aided Manufacturing (CAM)	4
MCHN 2382	CAPSTONE: Tool & Die Technology	3
	Credit Hours	**13-14**
	Total Credit Hours	**60-61**

[1] Identifies courses to fulfill minimum 15 credit hour General Education requirement