

Advanced Manufacturing Technology

Description

This program offers students training opportunities in various metal working occupations. Students in this program will learn the safe use of hand tools and the set-up and operation of conventional machine shop tools such as lathes, milling machines, drill presses, and surface grinders. The emphasis of the training focuses on the set-up, operation, and programming of Computer Numeric Controlled (CNC) machine shop tools, and CAD/CAM programming software instruction. Additionally, the interpretation of engineering drawings, semi-precision and precision measurement, material characteristics and metallurgy are components of the curriculum.

Program Learning Outcomes

1. Demonstrate knowledge of proper safety procedures in the shop.
2. Demonstrate ability to create and interpret drawings and specifications for a manual machine.
3. Demonstrate ability to create and interpret drawings and specifications for a CNC machine.
4. Layout and construct precision parts using semi-precision tools and hand tools.
5. Demonstrate ability to create parts as well as identify safe and proper operating techniques of manually operated lathes.
6. Demonstrate ability to create parts as well as identify safe and proper operating techniques of CNC Lathes.
7. Demonstrate the ability to create parts as well as identify safe and proper operating techniques of manually operated milling machines.
8. Demonstrate the ability to create parts as well as identify safe and proper operating techniques of a CNC milling machine.

Curriculum

Course #	Course Title	Lecture/ Lab Hours	Credit Hours	Clock Hours
LEAD 1003	Work Readiness	2/2	3	90
WKSF 1003	Industrial Workplace Safety	2/2	3	90
IMFG 1013	Industrial Mathematics	2/2	3	90
IMFG 1023	Machine Shop I	2/2	3	90
IMFG 1033	Machine Shop II	2/2	3	90
CTS - Machinist Helper			15	450
IMFG 1213	Basic Lathe I	2/2	3	90
IMFG 1223	Basic Mill I	2/2	3	90
IMFG 1233	CNC I	2/2	3	90
IMFG 1243	Basic Lathe II	2/2	3	90
IMFG 1253	Basic Mill II	2/2	3	90
IMFG 1263	CNC II	2/2	3	90
CTS - CNC Operator			33	990
IMFG 2013	Machine Shop III	2/2	3	90
IMFG 2023	CNC III	2/2	3	90
IMFG 2033	Machine Shop IV	2/2	3	90
IMFG 2043	Capstone: CNC IV	1/3	3	105
TD - Advanced Manufacturing Technician			45	1365

Course Descriptions

IMFG 1013 Industrial Mathematics

Introduction to careers in machining. Precision measuring, metal identification systems, and safe working techniques.

IMFG 1023 Machine Shop I

Students will study and learn to interpret various detail drawings and manufacture parts from steel using files, hacksaws, bandsaws, drill bits, and taps & dies.

IMFG 1033 Machine Shop II

Students will learn to calculate cutting speeds and feeds on manual lathes and milling machines. Students will learn to use various working holding and tool holding devices. Precision alignment on lathes and mills will be practiced.

IMFG 1213 Basic Lathe I

Students will practice sharpening lathe cutters, and learn to turn, face, and bore on manual lathes.

IMFG 1223 Basic Mill I

Students will manufacture simple parts on the milling machine and begin to use various milling operations.

IMFG 1233 CNC I

Students will study the fundamentals of computer numerically controlled machine tools including CNC Lathe and CNC mill.

IMFG 1243 Basic Lathe II

Students study advanced operations and apply taper turning technics on the manual lathe.

IMFG 1253 Basic Mill II

Students will manufacture simple parts on the milling machine and begin to use various milling operations.

IMFG 1263 CNC II

Students will study and practice CNC programming and set-up & operations on the CNC turning center.

IMFG 2013 Machine Shop III

Student study advanced operations on the manual lathes focusing on machining threads. Right hand, left hand, metric, and acme threaded projects are machined.

IMFG 2023 CNC III

Students will program, set-up and operate the CNC Milling machines and build parts to specifications on blueprints.

IMFG 2033 Machine Shop IV

Students will machine components to be assembled using advanced operations on manual and CNC lathes and mills. Also, precision grinding principles will be practiced on surface grinders and tool post grinders.

IMFG 2043 Capstone: CNC IV

Students will use Mastercam to generate code to be transferred to 3, 4, & 5 axis CNC machines.

LEAD 1003 Work Readiness

This course is designed to prepare for job readiness by reviewing the skills necessary for employment, including time management, communication, teamwork, and professionalism. The student will engage in a variety of skill-building activities, create a resume, participate in a simulated interview process, and review basic math and English skills necessary for their chosen program of study.

WKSF 1003 Industrial Workplace Safety

This course will provide an overview of the construction industry by examining organizational structures and systems, safety regulations and agencies, construction documents, office and field organizations, and the various construction crafts and trades. This course will focus on the basic knowledge and skills needed in the construction industry by studying safety, math, hand tools, power tools, rigging, blueprint reading, communication, and employability.