



GREEN COUNTRY TECHNOLOGY CENTER

Career Cluster: Manufacturing
Pathway: Production
Major: CNC Manufacturing Technician
Local Name: CNC Manufacturing Technician
Instructor: Jerry Logan
Total Hours: 1050

<u>Sequence of Courses:</u>	<u>Hours</u>
Computer-Aided Machining	150
Intro to Quality Control	60
Computer Numerical Control Programming	100
CNC Operations	105
CNC Setup	100
CNC Lathe Operations	100
CNC Milling Operations	150
Precision Measurement	45
Print Reading for Machining	60
Machine Tool Theory	45
Fundamentals of Manufacturing	45
Manual Machining Techniques	90

Course Descriptions:

Fundamentals of Manufacturing

This course covers occupational health and safety, tools and equipment identification, usage and operations. The students will learn about the history, current state and future of the manufacturing industry. This course will cover general manufacturing and plant safety rules and regulations for industrial maintenance technicians, precautions for electrical, fluid power, and mechanical hazards on the job, tool and equipment safety, first aid, CPR, blood borne pathogens, OSHA and NFPA mandated lockout/tagout, personal protective equipment, right to know, and confined space entry procedures.

Machine Tool Theory

Study, recognition and discussion of machine tool structures and capabilities, safety systems, metal cutting theory, shop calculations, tool geometry, cutting tool materials and standards, cutting fluids and non-traditional processes. The applications of these principles are related to machine shop operations. Lab work is required.

Print Reading for Machining

They will develop and demonstrate the skills required for visualizing and interpreting industrial prints. The student will apply these skills to machining practices. The student will demonstrate knowledge of drawings and prints, visualizing shapes, line usage, title blocks, contours, sectional views, geometric dimensioning and tolerancing and other appropriate concepts that are required by business and industry.

Precision Measurement

Systematic study of precision measuring tools including vernier-calipers, micrometers, dial indicators, optical comparator, and electronic and air gauges. Recognize, discuss and apply the principles of precision measurement. Laboratory work is an integral part of this course.

CNC Milling Operations

Included in this course is a introductory piece on the CNC side of Machining. Students will cover basic setup and programming offsets. Students will cover setup, boring, drilling, dividing head and rotary table work. Lab work is required. They will demonstrate and recognize proper principal and techniques in the milling machine work. Lab work is required.

CNC Lathe Operations

Students will cover setup, nomenclature, boring, drilling, turning, facing, screw threads, tapers and tool geometry. Lab work is required. They will demonstrate and recognize proper principal and techniques in the Engine Lathe machine work. Lab work is required.

Computer Numerical Control Setup

Develop basic set up and programming skills on computer numerical control (CNC) lathes, mills and machining centers. Topics covered include cutting tool set up, fixturing alignment and set up, uploading of programs, minor program editing, identification and application of various cutting tools and cutting tool configuration. Lab work is required.

Computer Numerical Control Operations

The student will develop basic set up and programming skills on computer numerical control (CNC) lathes, mills, and machining centers. Topics covered include cutting tool set up, fixturing, alignment and set up, uploading and downloading of programs, minor program editing, identification and application of various cutting tools and cutting tool configurations. Lab work is required.

Computer Numerical Control Programming

The student will recognize and discuss computer numerical control (CNC) programming principles and apply those principles by writing simple to complex CNC programs, manually and/or computer aided. Subjects covered include absolute and incremental programming, application of G and M codes, linear and circular interpolation, polar coordinate programming, canned cycles, and repetitive programming. The student will apply these principles using program preparation systems including geometry, code processor and simulator software packages. Lab work is required.

Computer-Aided Machining

The student will review principles of computer-aided machining (CAM) and apply these principles in the development of computer numerical control (CNC) programs for machine tools, using an integrated software system. Topics include development of job plans, using computer-aided drafting (CAD) databases, application and modification of post processors, and simulation of programmed operations. Lab work is required.

Intro to Quality Control

Students will cover the basics of quality control systems including Statistical Process Control, ISO 9000, and Total Quality Management.

Manual Machining Techniques

Students will demonstrate proper tooling selection, safe and effective setup principles and machining techniques on manual mills, lathes, grinders, metals saws, and drill press. Lab work is required.