

### ADVANTAGES

The CNC manufacturing and machining program features instruction in the safe operation of all basic machine tools, as well as proper measurement and inspection of parts. Interpreting engineering drawings and mathematical calculations required by all machinists is also presented. The second year includes shop math and CNC (Computer Numerical Controls) programming with an emphasis on hands-on skills using advanced machine tools. The understanding of quality control and how to conduct appropriate measurements and inspection will be integrated into the course work. The intent is to graduate someone with overall advanced machine shop skills.

### PROGRAM STUDENT LEARNING OUTCOMES

- Demonstrate and apply safe operation of all machine tools.
- Student will be proficient in basic lathe operation.
- Student will be proficient in basic milling operation.
- Demonstrate mathematical operations using accepted mathematical applications.
- Demonstrate ability to perform advanced procedures on assigned projects.
- Student will be proficient in writing CNC programs for lathe.
- Student will be proficient in writing CNC programs for milling machine.
- Student will be proficient and apply GDT to all projects.
- Student will demonstrate ability to operate CNC equipment.
- Students will demonstrate all knowledge in capstone project.

### DIRECT ENTRY INTO BACCALAUREATE DEGREE PROGRAM

Build on your associate degree to complete a bachelor's 100% online. Alfred State CNC manufacturing and machining graduates may enter directly into the technology management BBA degree program. Graduates who have credit for freshman composition, statistics, literature, history, and speech may complete the BBA program in two additional years; others may complete the BBA program in two-and-one-half years.

### ENTRANCE REQUIREMENTS/RECOMMENDATIONS

Recommended: Algebra

### OCCUPATIONAL OPPORTUNITIES

CNC programmers	CNC engineers	Machine setters	Machinists
CNC machinists	Tool and die makers	& operators	Mold makers

### TECHNICAL STANDARDS

It is essential that students in this degree program can participate fully and safely, with or without reasonable accommodations in all classrooms, laboratory, or field experiences required for completion of the program. Students in this degree program:

- Must be able to function in a safe manner, not placing themselves, faculty, staff, or other students in jeopardy.
- Must be able to appropriately and safely use standard laboratory equipment, materials, and instrumentation that requires possession of fine motor skills and mobility.
- Must be able to lift up to 50 pounds to a height of 5ft in order to load materials into manufacturing machines.
- Must be able to communicate orally with a person 6 to 10 feet away in a shop environment.
- Must be able to visually decipher an oscilloscope monitor and digital/analog meter, and scan tool displays.
- Must be able to diagnose mechanical failures that are distinguished audibly.
- Must be able to understand and retain information found in service repair manuals and use diagnostic flow charts.
- Must be able to stand for long periods of time.

**Did you know the average salary for a machinist in industry today is ranked the seventh highest among all American professions (including doctors, lawyers, etc.), and this average salary is higher than the average salary for all four-year college graduates?**

**If earning a high salary is on your list for selecting occupational opportunities, you need to look at CNC manufacturing and machining. More than 50 percent of all machinists in America today will retire in the next 10 to 15 years. This fact alone shows the tremendous opportunity that awaits the trained and well-qualified machinist.**

### TYPICAL FOUR-SEMESTER PROGRAM

#### First

MATT 1004	Basic Industrial Machining	4
MATT 1014	Industrial Machining I	4
MATT 1024	Industrial Machining II	4
MATT 1713	Reading Engineering Drawings	3
MATT 1913	Machinist Calculations I	3
		<b>18</b>

#### Second

MATT 1234	Industrial Machining III	4
MATT 1244	Industrial Machining IV	4
MATT 1254	Industrial Machining V	4
MATT 1723	Reading Engineering Drwngs II	3
MATT 1923	Machinist Calculations II	3
		<b>18</b>

#### Third

MATT 3005	Intro to CNC Machine Program	5
MATT 3015	CNC Industrial Machining I	5
MATT 3025	CNC Industrial Machining II	5
MATT 3003	Geometric Dimensioning & Toler	3
		<b>18</b>

#### Fourth

MATT 4005	CNC Industrial Machining III	5
MATT 4015	CNC Industrial Machining IV	5
MATT 4025	CNC Industrial Machining V	5
MATT 4003	Senior Project	3
		<b>18</b>

### Graduation requirements

- A student must successfully complete all courses and earn a minimum cumulative index of 2.0, which is equivalent to a "C" average, in the prescribed four-semester program.
- Students are required to have earned a minimum grade of "C" in MACH CALC I & II, and in the MATT 4003 Senior Project. (*Articulation is available in MACH CALC area*)