

Campus:

Ashland



## Program Overview

The one-year Machine Tool Operation program emphasizes core machining skills and will prepare the student for a career in the machining industry. Students will learn the machining skills required to set up and operate manual and computer-controlled machines. Students will learn to use hand tools, precision measuring instruments, read prints, and create parts using a computer-aided manufacturing system. Skilled machine tool operators work in job shops, production, and maintenance shops.

## Admission Requirements

Students in this program must:

- Complete application form and submit with fee (fee waiver may apply if previously submitted)
- Complete Accuplacer entrance assessment to determine placement (waiver may apply with acceptable alternative test scores and/or postsecondary degree completion)
- Complete admissions interview with a WITC counselor (above requirements should be completed prior to interview)

## Student Profile

Machine Tool Operation students should be able to:

- Think mechanically
- Work well under pressure
- Enjoy working with their hands
- Work at repetitive tasks
- Give attention to detail
- Assume responsibility
- Organize their work
- Work with a variety of skilled and non-skilled workers and professionals
- Take constructive criticism
- Work well under supervision

## Preparation for Admission

Students should strive to reach a comfort level in the following courses or skills:

- Communications
- Mechanical Design
- Geometry/Algebra I and II/Trigonometry
- General Metals
- Machine Shop
- Principles of Technology
- Keyboarding
- Print Reading/Computer-Aided Drafting

## Program Outcomes

Employers will expect one-year Machine Tool Operation graduates to be able to:

- Apply basic safety practices in the machine shop
- Interpret industrial/engineering drawings
- Apply precision measuring methods to part inspection
- Perform basic machine tool equipment set-up and operation
- Perform programming, set up, and operation of CNC machine tools

Collegewide outcomes and indicators will also be addressed to develop personal awareness, career effectiveness, and professionalism. See page 5 for a list of collegewide outcomes and indicators.

## Career Outlook

Graduates from the one-year Machine Tool Operation program will be ready to start their careers as:

- Machine Operators
- Machinist Apprentices
- Machine Setup Operators

With further training, graduates may advance to:

- All-round Machinist
- Tool and Die Maker
- Machine Programming
- Machine Shop Operator
- Tool-machine Setup Operator

## Curriculum

| Number  | Course Title                                    | Credits   |
|---|---|-----------|
| <b>Occupational Specific Courses</b>                                |   |           |
| 31420301  | Machine Tool Operation 1                        | 5         |
| 31420302  | Machine Tool Operation 2 <sup>▲</sup>           | 4         |
| 31420303  | Machine Tool Operation 3 <sup>▲</sup>           | 5         |
| 31420304  | Machine Tool Operation 4 (WBL) <sup>▲</sup>     | 4         |
| 31420322  | Print Reading for Machine Trades 1              | 1         |
| 31420323  | Print Reading for Machine Trades 2 <sup>▲</sup> | 1         |
| 31420345  | Machine Tool Theory 1                           | 2         |
| 31420347  | Machine Tool Theory 2 <sup>▲</sup>              | 2         |
| 32420361  | Introduction to CAD/CAM                         | <u>1</u>  |
|   |   | 25        |
| <b>Occupational Supportive/General Studies Courses <sup>▸</sup></b> |   |           |
| 32801361  | Applied Communications 1                        | 2         |
| 32801363  | Applied Communications 2 <sup>▲</sup>           | 2         |
| 32804355  | Math 355  | 3         |
| 32804364  | Math 364 <sup>▲</sup>                           | 2         |
| 32809371  | Applied Human Relations                         | <u>2</u>  |
|   |   | 11        |
|   | <b>PROGRAM REQUIREMENTS</b>                     | <b>36</b> |

<sup>▲</sup> Requires a prerequisite and/or corequisite that must be completed with a grade point of 2.0 or better.

<sup>▸</sup> See page 40 for General Studies course descriptions.

# Course Descriptions

(See page 40 for General Studies course descriptions)

## 31420301

### Machine Tool Operation 1 - Credits: 5

Students will be assigned introductory, specifically designed projects that will be machined using the engine lathe, milling machine, drill press, and various saws. Students will be in a job-like setting. The capability and safe use of machine tools will be stressed.

## 31420302

### Machine Tool Operation 2 - Credits: 4

Students will be assigned basic, specifically designed projects that will be machined using the engine lathe, milling machine, drill press, and various saws. Students will also machine parts on conversationally-programmed CNC lathes and vertical mills. Students will be in a job-like setting. The capability and safe use of machine tools will be stressed. COREQUISITE: 31420301 Machine Tool Operation 1.

## 31420303

### Machine Tool Operation 3 - Credits: 5

A continuation of Machine Tool Operation featuring advanced operations on milling machines, grinders, lathes, and drill presses. CNC operation and programming on a vertical mill and a turning center are introduced. Also included are machine maintenance and precision measurement. The capability and safe use of machine tools will be stressed. PREREQUISITE: 31420302 Machine Tool Operation 2.

## 31420304

### Machine Tool Operation 4 (WBL) - Credits: 4

Machine Tool Operation 4 features advanced operations on milling machines, grinders, lathes, and drill presses. CNC programming and operation on vertical mills and turning centers will be emphasized. The capability and safe use of machine tools will be stressed. COREQUISITE: 31420303 Machine Tool Operation 3.

## 31420322

### Print Reading for Machine Trades 1 - Credits: 1

This course will cover the basic principles of print reading. The emphasis will be on object representation, geometric dimensioning and tolerances (GDT), threads, and section views. Strongly recommend a basic understanding of mathematics concepts.

## 31420323

### Print Reading for Machine Trades 2 - Credits: 1

This advanced print reading course will cover drawing changes, auxiliary and section views, detail and assembly prints, machined features, gears, and CNC documents. PREREQUISITE: 31420322 Print Reading for Machine Trades 1.

## 31420345

### Machine Tool Theory 1 - Credits: 2

This course will cover the basic principles of machine tool theory. The course will emphasize safety in the machine shop, measurement, metal cutting technology, basic lathe and mill operations, drilling machines, saws, layout procedures, and an introduction to CNC machining. The capability and safe use of machine tools will be stressed.

## 31420347

### Machine Tool Theory 2 - Credits: 2

This course will cover principles of machine tool theory emphasizing conventional and CNC machining operations. There will be in-depth training on the engine lathe, milling machines, CNC programming and operation, grinding machines, and metallurgy. The capability and safe use of machine tools will be stressed. PREREQUISITE: 31420345 Machine Tool Theory 1.

## 32420361

### Introduction to CAD/CAM - Credits: 1

This course will introduce students to computer-aided drafting (CAD) and computer-aided machining (CAM). Students will use appropriate CAD software to prepare mechanical drawings. Students will be introduced to CAD/CAM equipment.

Gainful employment information is available at this link: <http://www.witc.edu/pgmpages/machop/career.htm>. This information is provided as a federal requirement in an effort to help students make informed decisions related to the costs and potential employment in a chosen field.

## Graduate Employment Information

(WITC Graduate Survey Responses 2009-2010; for most recent data, go to [witc.edu](http://www.witc.edu))

|                                 |    |                           |     |                             |                   |
|---------------------------------|----|---------------------------|-----|-----------------------------|-------------------|
| Number of graduates             | 12 | Number employed           | 6   | % employed in WITC district | 83%               |
| Number of responses             | 11 | Percent employed          | 86% | Range of yearly salary      | \$23,398-\$38,997 |
| Number available for employment | 7  | Employed in related field | 6   | Average yearly salary       | \$31,793          |

*career vision*