



## **Wisconsin Technical College System Curriculum Standards Model & Program Design Summary**

### **50-439-3 TOOL & DIE APPRENTICE**

#### **Program Information**

#### **Program Description**

Tool and die makers analyze specifications, lay out metal stock, set up and operate machine tools, and fit and assemble parts to make and repair dies, gauges, jigs, fixtures (devices that hold metal while it is shaped, stamped or drilled), gauges, and machinist's hand tools. Die makers construct metal forms (dies) to shape metal in stamping and forging operations. A tool and die maker operates various machine tools to make and repair molds, special machinery, tools, dies, jigs, fixtures and die cast dies. In this apprenticeship, learn basic theory in machining, blueprint reading and metallurgy, in addition to knowledge in stamping, mold making blanking, jigs and fixtures, plastics and die casting. Computer-assisted CNC machining and die and mold design are also covered.

#### **External Requirements**

The Wisconsin Department of Workforce Development, Bureau of Apprenticeship Standards has the following training standards:

- 5 year training program
- 10,400 hours on-the-job training
- 576 hours paid related instruction
- Possible additional hours of unpaid related instruction

#### **Entry Requirements**

- Entry requirements vary by employer
- High school diploma or equivalent
- Physically able to perform trade
- Applicants apply directly to participating employers

**Related Outcomes** – Program Outcomes TBD & pending TSA and/or NIMS alignment

#### **Program Configurations**

#### **50-439-3 WTCS Machine Tool & Die Apprenticeship Related Instruction**

#### **Program Configuration Model for Related Instruction**

This program configuration serves as a curriculum standards model for related instruction in the tool and die apprenticeships. The program includes trades associated with tool and die makers and designers, pattern makers, and mold makers, and provides for up to 576 hours of related instruction. The program configuration

model outlines coursework in machine trades and tool and die theory and application. Courses in industrial math, applied communication and human relations are intended to support the apprentice in success as a future journey worker. The Transition to Trainer course is shown in an additional term for reference but may be taken at any time during the last year of the apprenticeship.

Under this model, courses may be scheduled for a single 8-hour class period each week, or the equivalent. Both the maximum course hours and credits approved by the WTCS are illustrated below to help plan and coordinate related instruction with employers, BAS and the technical colleges.

Credits & Hours

- 1 - Occupation Specific            13.00 and 468 hours at 36 hours per credit
- 2 - Occupation Supportive        3.00 and 108 hours at 36 hours per credit

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**16.00 and 576 hours without Transition to Trainer – OR-**

**Total Credits**

16 credits and 512 hours for 16-week term colleges using 32 hrs./cr.

**Term 1**

Course #	Course Title	Credits & Approved Hours	Course Description
50-420-520	<b>Metals Trade Theory I</b>	3.00 108 hours	Become familiar with basic theory related to topics such as in machining, blueprint reading, metallurgy, foundry, measurement, and safety in order to establish a solid foundation on which more specialized units - such as plastic moldmaking, stamping dies, CNC machining, and jig and fixture design - can be built.
50-804-504	<b>Industrial Math 1</b>	1.00 36 hours	Explore the topics of applied arithmetic and algebra. Study concepts related to measurement, fractions, decimals, percent, ratio and proportion, signed numbers, formula substitution, solutions to equations, tapers and gears. Calculate the areas and volumes of common geometric shapes.

**Term 2**

Course #	Course Title	Credits & Approved Hours	Course Description
50-420-521	<b>Metals Trade Theory II</b>	3.00 108 hours	Explore topics including welding, milling machines, mechanical motions, electrical principles, layout, drill press, grinding, boring bar, jig boring, shapers, and planers.
50-804-505	<b>Industrial Math 2</b>	1.00 36 hours	Examine topics in geometry and trigonometry that are related to the metalworking trades. Practice applying geometric theorems and solving both right and oblique triangle problems

**Term 3**

<b>Course #</b>	<b>Course Title</b>	<b>Credits &amp; Approved Hours</b>	<b>Course Description</b>
50-439-570	<b>Tool &amp; Die Theory I</b>	3.50 126 hours	Start on the path from tool and die apprentice to journeyman as you explore advanced trade theory in stamping, blanking, jigs and fixtures, plastics, and die casting. Become familiar with special machines used in the field.
50-801-500	<b>Applied Communications</b>	0.50 18 hours	Enhance interpersonal communication skills, especially the oral and listening skills needed by those in apprentice programs

**Term 4**

<b>Course #</b>	<b>Course Title</b>	<b>Credits &amp; Approved Hours</b>	<b>Course Description</b>
50-439-575	<b>Tool &amp; Die Theory II</b>	3.50 126 hours	Continue on the path from tool and die apprentice to journeyman by exploring advanced trade theory in stamping, blanking, jigs and fixtures, plastics, and die casting. Become familiar with special machines used in the field.
50-809-551	<b>Human Relations - Apprentice</b>	0.50 18 hours	Study the psychological principles of human relations that will assist in adaptation to the world of work and adjustment to personal and occupational relationships.

**Additional Term(s)**

<b>Course #</b>	<b>Course Title</b>	<b>Credits &amp; Approved Hours</b>	<b>Course Description</b>
47-455-455	<b>Transition to Trainer: Your Role as a Journey Worker</b>	0.00 8 hours	<p>Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.</p> <p>You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job.</p>



## Wisconsin Technical College System

### 50-420-520 Metals Trade Theory I

#### Course Outcome Summary

##### Course Information

**Description** Become familiar with basic theory related to topics such as in machining, blueprint reading, metallurgy, foundry, measurement, and safety in order to establish a solid foundation on which more specialized units - such as plastic moldmaking, stamping dies, CNC machining, and jig and fixture design - can be built.

**Total Credits** 3.00



## Wisconsin Technical College System

### 50-420-521 Metals Trade Theory II

### Course Outcome Summary

#### Course Information

**Description** Explore topics including welding, milling machines, mechanical motions, electrical principles, layout, drill press, grinding, boring bar, jig boring, shapers, and planers.

**Total Credits** 3.00



## Wisconsin Technical College System

### 50-439-570 Tool & Die Theory I

### Course Outcome Summary

#### Course Information

**Description** Start on the path from tool and die apprentice to journeyman as you explore advanced trade theory in stamping, blanking, jigs and fixtures, plastics, and die casting. Become familiar with special machines used in the field.

**Total Credits** 3.50



## **Wisconsin Technical College System**

### **50-439-575 Tool & Die Theory II**

#### **Course Outcome Summary**

##### **Course Information**

**Description** Continue on the path from tool and die apprentice to journeyman by exploring advanced trade theory in stamping, blanking, jigs and fixtures, plastics, and die casting. Become familiar with special machines used in the field.

**Total Credits** 3.50



## **Wisconsin Technical College System**

### **50-801-500 Applied Communications**

#### **Course Outcome Summary**

##### **Course Information**

**Description** Enhance interpersonal communication skills, especially the oral and listening skills needed by those in apprentice programs

**Total Credits** 0.50





## Wisconsin Technical College System

### 50-804-504 Industrial Math 1

### Course Outcome Summary

#### Course Information

**Description** Explore the topics of applied arithmetic and algebra. Study concepts related to measurement, fractions, decimals, percent, ratio and proportion, signed numbers, formula substitution, solutions to equations, tapers and gears. Calculate the areas and volumes of common geometric shapes.

**Total Credits** 1.00



## Wisconsin Technical College System

### 50-804-505 Industrial Math 2

### Course Outcome Summary

#### Course Information

**Description** Examine topics in geometry and trigonometry that are related to the metalworking trades. Practice applying geometric theorems and solving both right and oblique triangle problems

**Total Credits** 1.00



## Wisconsin Technical College System

### 50-809-551 Human Relations - Apprentice

### Course Outcome Summary

#### Course Information

**Description** Study the psychological principles of human relations that will assist in adaptation to the world of work and adjustment to personal and occupational relationships.

**Total Credits** 0.50



## Wisconsin Technical College System

### 47-455-455 Transition to Trainer: Your Role as a Journey Worker

#### Course Outcome Summary

##### Course Information

**Description** Apprenticeship training is a collaborative partnership: employer and employee associations, government, and educational institutions each play a part. In reality, most learning takes place through the daily interaction between an apprentice and his/her co-workers. Surveys have shown that the apprentices are least satisfied with the on-the-job portion of their training--particularly the ability of journey level workers and supervisors to pass on their knowledge of the trade.

You have already learned to use the tools of your chosen trade. In this workshop you will be introduced to a new set of basic tools--the tools of a jobsite trainer. You will explore the skills that are necessary to be an effective trainer, discover how to deliver hands-on training, and examine the process for giving useful feedback. During the workshop you will build a Training Toolkit to take back to your work on the job.

##### Course Competencies

- 1 Value your role as a journey worker trainer
- 2 Serve as a mentor and job coach
- 3 Foster a positive work environment by acting as an ally/advocate
- 4 Provide hands-on skills training
- 5 Provide feedback on apprentice performance