

Wisconsin Technical College System Curriculum Standards Model & Program Design Summary

50-423-1 Maintenance Mechanic/Millwright Apprenticeship (Related Instruction)

Program Information

Program Description

Maintenance mechanics and millwrights install, dismantle, or move machinery and heavy equipment according to layout plans, blueprints, or other drawings. They keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe-fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing; aligning; and balancing new equipment; and repairing buildings, floors, or stairs. This program provides the related instruction portion for this trade's apprenticeship.

External Requirements

1. Wisconsin Department of Workforce Development, Bureau of Apprenticeship Standards, Exhibit A Work Processes.
2. 4 year on-the-job training program which includes 7,440 hours on-the-job and 576 hours of paid related instruction.
3. Other requirements as set forth by the State advisory committee, BAS and others.
4. Transition to Trainer course in the final year.

Program Outcomes

- 1 Demonstrate proper rigging techniques
- 2 Select an appropriate power transmission system for a given application
- 3 Identify suitable pumps for given applications
- 4 Recommend bearings for given applications
- 5 Plan for fabricating parts and assemblies according to specifications
- 6 Apply operational and troubleshooting principles to fluid power systems
- 7 Layout an equipment installation plan
- 8 Plan maintenance schedules for a given system

Program Configurations for Related Instruction:

This program configuration represents an aligned model for paid related instruction that comprises 4 years and 8 semesters (terms). It reflects a total of 576 hours of combined on-campus lecture, lab, shop, and hands-on learning. The alignment model reflects courses which can be used to assess program outcomes under TSA. The alignment model shows program outcomes which are aligned with relevant industry/manufacturing standards. The model also lists courses common to all programs across the colleges. Further, the model

aligns common course numbers that colleges may use across the WTCS in the future (along with recommended hours and credits). The aligned curriculum is a model that colleges may implement as they need to meet local needs along with hours dedicated for local options.

In April 2013, state advisory committee re-validated their recommendation that the curriculum model should follow a "Lazy Susan" approach. This means an apprentice may begin at any point in the 8-term/4-year sequence and that there would not be any pre-requisites for any courses. The state committee also understands and supports that some colleges may want to implement a building curriculum model for related instruction...aka term 1 is foundational to term 2 and term 2 might be a pre-requisite for term 3 and so forth. Colleges and local committees should determine what best supports employer needs and apprentices success in the trade; however the competencies in each course should be addressed at a minimum.

Total Credits: 18.50

Total Hours: 576 (72 hours per term x 8 terms or equivalent)

Term 1

Course #	Course Title	Credits Hours	Course Descriptions
50-423-710	Math and Physics for MMMP Trades (C1)	1.00 36 hours	This course examines math and physics concepts as they relate to millwrights and machine maintenance. Apprentices will develop skills related to converting fractions to decimals; using both standard and metric systems; applying basic algebra to solving problems; computing area, volume, mass, and torque; using basic trigonometry; and using math charts, tables and references in support of common work processes.
50-423-711	Print Reading for MMMP Trades (C-2)	1.00 36 hours	This course explores reading prints commonly used by millwrights and machine maintenance workers. Course competencies include comparing types of prints, interpreting structural drawings, identifying parts from prints, and develop apprentice sketching drawing skills.

Term 2

Course #	Course Title	Credits Hours	Course Descriptions
50-423-714	Rigging for MMMP Trades (C-5)	1.00 32 hours	Apprentices will compare types of rigging equipment and their uses; determine safe loads, rig and crib loads, and move a load with cranes and hoists in this course.
50-423-715	Welding for MMMP Trades (C-6)	0.50 10 hours	Course compares common welding processes and develops apprentice skills related to welding, cutting, heating and using oxy-gas. Welding with arc, MIG and TIG is included, along with common cutting and joining techniques.
50-423-716	Metallurgy for MMMP Trades (C-7)	0.50 10 hours	This course develops apprentice skills regarding metallurgical concepts. Apprentices will compare various metals and their applications, apply metallurgical techniques to work processes, test metals for hardness, and examine heat treating applications.
50-423-712	Fasteners for MMMP Trades (C-3)	0.25 8 hours	Course provides apprentices with a chance to compare fasteners and their uses, analyze fastener failures, and install mechanical fasteners.
50-423-713	Precision Measurements for MMMP Trades (C-4)	0.50 12 hours	This course develops apprentice skills in precision measurement. Types of measuring instruments will be compared and then measuring skills using tapes, steel rules, micrometers, calipers, indicators, and gauges will be developed.

Term 3

Course #	Course Title	Credits Hours	Course Descriptions
50-423-717	Hydraulics for MMMP Trades (C-8)	0.75 20 hours	This course provides instruction to apprentices concerning many aspects of inspecting, servicing, and troubleshooting hydraulic systems and components. Apprentices will learn safety related issues and be taught proper safety procedures for working with hydraulic systems and components.
50-423-718	Pneumatics & Compressed Air for MMMP Trades (C-9)	0.75 20 hours	It provides instruction to apprentices concerning many aspects of inspecting, servicing, and troubleshooting pneumatic systems and components. Apprentices will learn safety related issues and be taught proper safety procedures for working with pneumatic systems and components.
50-423-719	Vacuum Systems for MMMP Trades (C-10)	0.75 20 hours	Course introduces principles of vacuum systems and interpreting vacuum system schematics. Apprentices will then develop skills related to installing, repairing, replacing and applying troubleshooting principles to vacuum systems and components. Course examines preventative maintenance techniques commonly used on the job.
999-999	Local College Options for MMMP Apprentices	0.50 12 hours	12 hours

Term 4

Course #	Course Title	Credits Hours	Course Descriptions
50-423-720	Pipefitting & Valves for MMMP Trades (C-11)	0.75 24 hours	Course introduces apprentices to pipe sizes, materials and schedules, examines fittings, tubing and valves, and develops skills related to layout, installation, and maintenance.
50-423-722	Packings, Seals, Gaskets for MMMP Trades (C-13)	0.50 16 hours	Apprentices will examine packing, seals, and gaskets and compare materials and applications. Then skills in layout, cutting, inspecting, removing, and installing these components will be developed.
50-423-723	MSDS & Adhesives and Sealants for MMMP Trades (C-14)	0.25 8 hours	Course compares adhesives and sealant types and applications. Then apprentice skills will be developed related to applying adhesives and sealants to repair applications, interpreting MSDS information, and handling hazardous materials.
50-423-732	Pumps for the MMMP Trades (M-3)	0.75 24 hours	Course compares different pump types and their applications. Apprentices will complete a field inspection of pumps and learn how to troubleshoot, remove, overhaul, install and perform preventative maintenance on pumps.

Term 5

Course #	Course Title	Credits Hours	Course Descriptions
-----------------	---------------------	--------------------------	----------------------------

50-423-726	Green Awareness for the MMMP Trades (C-17)	1.00 36 hours	Green Awareness for the MMMP Trades examines how green projects and sustainable manufacturing initiatives relate to energy efficiency, energy consumption, waste reduction, and changing work processes for the MMMP related trades. Priorities related to cost awareness, energy efficiency, predictive and preventative maintenance, new materials, bearing maintenance, and precision laser alignment are included in this course.
50-423-724	Preventive and Predictive Maintenance for MMMP Trades (C-15)	1.00 36 hours	Course examines both preventative and predictive maintenance concepts as they apply to millwright work processes and machine maintenance. Apprentices will develop skills related to assessing machine conditions and faults based on both preventative and predictive maintenance.

Term 6

Course #	Course Title	Credits Hours	Course Descriptions
50-423-730	Bearings for the MMMP Trades (M-1)	0.75 24 hours	Apprentices will examine bearing types and applications, and compare equipment bearings. Then learners will develop skills related to bearing inspection, selection, removal, mounting, lubrication and diagnosing bearing failures.
50-423-731	Couplings & Alignment for the MMMP Trades (M-2)	1.00 36 hours	Course compares different coupling types and examines common misalignment problems. Apprentices will develop skills related to inspecting, troubleshooting, and preparing couplings for removal and installation, and also aligning and lubricating couplings.
999-999	Local College Options for MMMP Apprentices	0.50 12 hours	12 hours

Term 7

Course #	Course Title	Credits Hours	Course Descriptions
50-423-733	Belts, Sheaves, Pulleys and Drives for the MMMP Trades (M-4)	0.75 24 hours	Course compares different belt types and drive components. Apprentices will develop skills related to inspecting, troubleshooting, removing, selecting, and installing belt drive systems.
50-423-734	Gears, Gearboxes, Gear Assemblies for the MMMP Trades (M-5)	0.75 24 hours	Course compares gear types and applications. Apprentices will develop skills inspecting gear assemblies, troubleshooting gear problems, removing gears and components, and reassembling gear drive systems.
50-423-735	Mechanical Power Transmission for the MMMP Trades (M-6)	0.75 24 hours	Course examines drive transmission systems and their applications, including roller chains. Apprentices will develop skills inspecting power transmission systems and troubleshooting mechanical drive systems.

Term 8

Course #	Course Title	Credits Hours	Course Descriptions
50-423-736	Conveyors for the MMMP Trades (M-7)	0.25 8 hours	Course examines chain, belt, and other types of conveyors and related components.
50-423-737	Equipment Installation for the MMMP Trades (M-8)	0.75 24 hours	Apprentices will layout equipment installations, plan for moving equipment, and set and level equipment.
50-423-738	Sheet Metal and Structural Steel Fabrication for the MMMP Trades (M-9)	0.75 24 hours	Course compares types of sheet metal and tools used by the trade. Apprentices will develop skills related to fabricating sheet metal and structural steel and then erecting structural steel.
999-999	Local College Options for MMMP Apprentices	0.50 16 hours	16 hours

Local Options for MMMP Apprenticeship Programs

Course #	Course Title	Credits	Course Descriptions
999-999	Carpentry (L-1)	varies	Vary by college & local needs
999-999	Computer Basics (L-2)	varies	Vary by college & local needs
999-999	Concrete (L-3)	varies	Vary by college & local needs
999-999	Electricity (L-4)	varies	Vary by college & local needs
999-999	Machine Lubrication (L-5)	varies	Vary by college & local needs
999-999	Machine Shop Fundamentals (L-6)	varies	Vary by college & local needs
999-999	Plastics (L-7)	varies	Vary by college & local needs
999-999	Refrigeration & AC (L-8)	varies	Vary by college & local needs
999-999	Heat Treat & Burners (L-9)	varies	Vary by college & local needs

Wisconsin Technical College System

50-423-710 Math and Physics for MMMP Trades

Course Outcome Summary

Course Information

Description This course examines math and physics concepts as they relate to millwrights and machine maintenance. Apprentices will develop skills related to converting fractions to decimals; using both standard and metric systems; applying basic algebra to solving problems; computing area, volume, mass, and torque; using basic trigonometry; and using math charts, tables and references in support of common work processes.

Total Credits 1.00

Course Competencies

- 1 Convert between fractions and decimals
- 2 Convert between standard and metric units
- 3 Solve basic algebra problems for unknowns such as Horse Power, pressures, etc.
- 4 Calculate area, volume, weight, and torque
- 5 Solve equations with ratios and proportions
- 6 Use math, charts, tables, and references to solve measurement problems
- 7 Apply concepts of simple machines to the disassembly and moving of equipment
- 8 Apply trigonometry concepts to piping systems and mechanical math problems



Wisconsin Technical College System

50-423-711 Print Reading for MMMP Trades

Course Outcome Summary

Course Information

Description This course explores reading prints commonly used by millwrights and machine maintenance workers. Course competencies include comparing the types of prints, interpreting structural drawings, identifying parts from prints, and developing apprentice sketching drawing skills.

Total Credits 1.00

Course Competencies

- 1 Examine different types of prints
- 2 Interpret structural drawings
- 3 Evaluate a part from drawing information
- 4 Create a sketch or drawing from a specific part assembly or layout

Wisconsin Technical College System

50-423-712 Fasteners for MMMP Trades

Course Outcome Summary

Course Information

Description Course provides apprentices with a chance to compare fasteners and their uses, analyze fastener failures, and install mechanical fasteners. Formerly module C-3 for related instruction in the MMMP apprenticeship program.

Total Credits 0.25

Course Competencies

- 1 Examine and identify different fasteners and their uses
- 2 Remove fastener and analyze failures
- 3 Install mechanical fasteners



Wisconsin Technical College System

50-423-713 Precision Measurements for MMMP Trades

Course Outcome Summary

Course Information

Description This course develops apprentice skills in precision measurement. Types of measuring instruments will be compared and then measuring skills using tapes, steel rules, micrometers, calipers, indicators, and gauges will be developed. This was formerly the C-4 module in related instruction for the MMMP trade apprenticeship.

Total Credits 0.50

Course Competencies

- 1 Examine different types of precision measurement instruments and their uses
- 2 Take measurements with tape measures and steel rules
- 3 Take measurements with micrometers
- 4 Take measurements with calipers
- 5 Take measurements with indicators
- 6 Take height measurements with various types of gauges

Wisconsin Technical College System

50-423-714 Rigging for MMMP Trades

Course Outcome Summary

Course Information

Description Apprentices will compare types of rigging equipment and their uses; determine safe loads, rig and crib loads, and move a load with cranes and hoists in this course. This course was formerly the C-5 module for related instruction in the MMMP apprenticeship.

Total Credits 1.00

Course Competencies

- 1 Identify the types of rigging equipment and their uses
- 2 Determine the safe working load of rigging equipment
- 3 Rig a load
- 4 Crib a load
- 5 Move a load with an overhead crane
- 6 Move a load with a mobile crane
- 7 Move a load with a portable hand hoisting/chain fall equipment



Wisconsin Technical College System

50-423-715 Welding for MMMP Trades

Course Outcome Summary

Course Information

Description Course compares common welding processes and develops apprentice skills related to welding, cutting, heating and using oxy-gas. Welding with arc, MIG and TIG is included, along with common cutting and joining techniques. This course was the former C-6 module for the MMMP apprenticeship program.

Total Credits 0.50

Course Competencies

- 1 Examine different welding processes
- 2 Weld, cut, and heat, using oxy-gas processes
- 3 Arc weld metal
- 4 MIG weld metal
- 5 TIG weld metal
- 6 Perform other types of cutting processes
- 7 Perform other types of joining processes



Wisconsin Technical College System

50-423-716 Metallurgy for MMMP Trades

Course Outcome Summary

Course Information

Description This course develops apprentice skills regarding metallurgical concepts. Apprentices will compare various metals and their applications, apply metallurgical techniques to work processes, test metals for hardness, and examine heat treating applications. This course is the former C-7 module for the MMMP apprenticeship program.

Total Credits 0.50

Course Competencies

- 1 Examine different types of metal and their properties
- 2 Examine different metallurgical techniques and their applications
- 3 Test metal hardness
- 4 Apply different types of heat-treating techniques

Wisconsin Technical College System

50-423-717 Hydraulics for MMMP Trades

Course Outcome Summary

Course Information

Description This course provides instruction to apprentices concerning many aspects of inspecting, servicing, and troubleshooting hydraulic systems and components. Apprentices will learn safety related issues and be taught proper safety procedures for working with hydraulic systems and components. It was formerly the C-8 module for the MMMP apprenticeship program.

Total Credits 0.75

Course Competencies

- 1 Define the principles of hydraulics
- 2 Interpret hydraulic schematic diagrams
- 3 Analyze the function of hydraulic system components
- 4 Apply troubleshooting principles to hydraulic systems
- 5 Remove construct and install conductors and connectors
- 6 Repair hydraulic components
- 7 Select hydraulic fluids
- 8 Perform preventive maintenance on hydraulic systems

Wisconsin Technical College System

50-423-718 Pneumatics & Compressed Air for MMMP Trades

Course Outcome Summary

Course Information

Description This course was formerly the C-9 module for the MMMP apprenticeship. It provides instruction to apprentices concerning many aspects of inspecting, servicing, and troubleshooting pneumatic systems and components. Apprentices will learn safety related issues and be taught proper safety procedures for working with pneumatic systems and components.

Analyze - means to separate the whole item into its component parts, examine each component, and interpret the significance, contribution, or impact of each as a part of the whole.

Check - means to verify proper operation.

Define - calls for a clear concise authoritative meaning. Boundaries of definitions should be stated.

Describe - recount, characterize, sketch or relate in a narrative form.

Differentiate - means to state the difference between or among the item in question.

Explain - clarify and interpret the information you present. In such an answer it is best to state the "how" and "why", reconcile any differences in opinion and where possible state causes. The aim is to make plain the conditions, which give rise to whatever you are examining.

Illustrate - means to explain or clarify your response to the problem by presenting a figure, picture, diagram, or concrete example.

Inspect - means to examine using all five senses as applicable.

Maintain - means to perform functions that ensure continued operation. (See service)

Overhaul - means to disassemble, inspect, repair as necessary and check.

Repair - means to correct a defective condition.

Service - means to perform functions that ensure continued operation. (See maintain)

Troubleshoot - means to analyze and identify malfunctions.

Total Credits 0.75

Course Competencies

- 1 Define the principles of pneumatics
- 2 Interpret pneumatic schematic diagrams
- 3 Analyze the function of pneumatic system components
- 4 Service an Filter-Regulator-Lubricator (FRL) unit
- 5 Apply troubleshooting principles to pneumatic systems
- 6 Service pneumatic conductors and connectors
- 7 Repair pneumatic components
- 8 Perform preventive maintenance on pneumatic systems
- 9 Examine air compressor systems, components and equipment



Wisconsin Technical College System

50-423-719 Vacuum Systems for MMMP Trades

Course Outcome Summary

Course Information

Description Course introduces principles of vacuum systems and interpreting vacuum system schematics. Apprentices will then develop skills related to installing, repairing, replacing and applying troubleshooting principles to vacuum systems and components. Course examines preventative maintenance techniques commonly used on the job. This course was formerly the C-10 module in related instruction for the MMMP apprenticeship.

Total Credits 0.75

Course Competencies

- 1 Define the principles of vacuum systems
- 2 Interpret vacuum system schematic diagrams
- 3 Install vacuum systems
- 4 Apply troubleshooting principles to vacuum systems
- 5 Repair and replace vacuum components
- 6 Perform preventive maintenance on vacuum systems



Wisconsin Technical College System

50-423-720 Pipefitting and Valves for MMMP Trades

Course Outcome Summary

Course Information

Description Course introduces apprentices to pipe sizes, materials and schedules, examines fittings, tubing and valves, and develops skills related to layout, installation, and maintenance. This course was formerly the C-11 module for the MMMP apprenticeship program.

Total Credits 0.75

Course Competencies

- 1 Examine pipe sizes, materials and schedules
- 2 Examine types of pipe fittings
- 3 Examine different types of tubing and their related components
- 4 Install tubing with fittings
- 5 Examine different types of valves and their related components
- 6 Layout a piping system
- 7 Install a piping system
- 8 Maintain piping systems



Wisconsin Technical College System

50-423-722 Packings, Seals, Gaskets for MMMP Trades

Course Outcome Summary

Course Information

Description Apprentices will examine packing, seals, and gaskets and compare materials and applications. Then skills in layout, cutting, inspecting, removing, and installing these components will be developed. This course was the former C-13 module for the MMMP apprenticeship program.

Total Credits 0.50

Course Competencies

- 1 Examine types of packing, seals, and gaskets
- 2 Examine packing, seal, and gasket materials and applications
- 3 Layout and cut gaskets
- 4 Inspect packings, seals, and gaskets
- 5 Remove packings, seals, and gaskets
- 6 Install packings, seals, and gaskets

Wisconsin Technical College System

50-423-723 MSDS & Adhesives and Sealants for MMMP Trades

Course Outcome Summary

Course Information

Description This course was formerly the C-14 module in related instruction for the MMMP apprenticeship. In 2013, based on instructor review, the competencies, performance standards, and learning objectives from the C-14 module was added to this course. Hours reflect the combined modules.

Total Credits 0.25

Course Competencies

- 1 Examine different adhesive and sealant types and their applications
- 2 Apply adhesives to a repair
- 3 Apply sealants for repair
- 4 Examine MSDS safety information for common industrial fluids
- 5 Withdraw hazardous materials from containers



Wisconsin Technical College System

50-423-724 Preventive and Predictive Maintenance for MMMP Trades

Course Outcome Summary

Course Information

Description Course examines both preventative and predictive maintenance concepts as they apply to millwright work processes and machine maintenance. Apprentices will develop skills related to assessing machine conditions and faults based on both preventative and predictive maintenance. This course is the former C-15 module in related instruction for the MMMP apprenticeship program.

Total Credits 1.00

Course Competencies

- 1 Examine the Preventive Maintenance method
- 2 Assess machine conditions and faults from the Preventive Maintenance process
- 3 Examine Predictive Maintenance methods

Wisconsin Technical College System

50-423-726 Green Awareness for the MMMP Trades

Course Outcome Summary

Course Information

Description	Green Awareness for the MMMP Trades examines how green projects and sustainable manufacturing initiatives relate to energy efficiency, energy consumption, waste reduction, and changing work processes for the MMMP related trades. Priorities related to cost awareness, energy efficiency, predictive and preventative maintenance, new materials, bearing maintenance, and precision laser alignment are included in this course. Each competency can stand alone and be added to existing modules in the paid related instruction program, or the course can be delivered in its entirety as a new module in the curriculum. Estimated hours shown with each competency are intended to guide educators and employers with planning, and may be modified to meet local needs. Course was formerly the C-17 module in related instruction for the MMMP apprenticeship programs.
Total Credits	1.00

Course Competencies

- 1 Be aware of costs, and the business motive for green projects and sustainable manufacturing improvements
- 2 Analyze energy efficiency initiatives for industrial plants, equipment and facilities
- 3 Be aware of new materials and options for work processes
- 4 Relate predictive and preventative maintenance testing procedures to green and sustainable manufacturing principles
- 5 Perform precision laser alignment on rotating machines and equipment
- 6 Be aware of bearing maintenance procedures that contribute to reduced costs

Wisconsin Technical College System

50-423-730 Bearings for the MMMP Trades

Course Outcome Summary

Course Information

Description Apprentices will examine bearing types and applications, and compare equipment bearings. Then learners will develop skills related to bearing inspection, selection, removal, mounting, lubrication and diagnosing bearing failures. Course was formerly the M-1 module in related instruction for the MMMP apprenticeship.

Total Credits 0.75

Course Competencies

- 1 Examine different bearing types and their applications
- 2 Handle equipment bearings
- 3 Inspect a bearing
- 4 Analyze bearing failures
- 5 Remove a bearing
- 6 Select a bearing
- 7 Mount a bearing
- 8 Lubricate a bearing



Wisconsin Technical College System

50-423-731 Couplings & Alignment for the MMMP Trades

Course Outcome Summary

Course Information

Description Course compares different coupling types and examines common misalignment problems. Apprentices will develop skills related to inspecting, troubleshooting, and preparing couplings for removal and installation, and also aligning and lubricating couplings. This course was formerly the M-2 module for related instruction in the MMMP apprenticeship programs.

Total Credits 1.00

Course Competencies

- 1 Examine different coupling types and misalignment
- 2 Inspect couplings
- 3 Troubleshoot couplings
- 4 Prepare for a coupling removal or installation
- 5 Align a coupling
- 6 Lubricate couplings

Wisconsin Technical College System

50-423-732 Pumps for the MMMP Trades

Course Outcome Summary

Course Information

Description Course compares different pump types and their applications. Apprentices will complete a field inspection of pumps and learn how to troubleshoot, remove, overhaul, install and perform preventative maintenance on pumps. This course was formerly the M-3 module for related instruction in the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Examine different pump types and their application
- 2 Complete a field inspection of pumps
- 3 Troubleshoot pumps
- 4 Remove a pump
- 5 Overhaul a pump
- 6 Install a pump
- 7 Perform pump preventive maintenance



Wisconsin Technical College System

50-423-733 Belts, Sheaves, Pulleys and Drives for the MMMP Trades

Course Outcome Summary

Course Information

Description Course compares different belt types and drive components. Apprentices will develop skills related to inspecting, troubleshooting, removing, selecting, and installing belt drive systems. This course was formerly the M-4 module for related instruction in the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Examine different types of belts and their related components
- 2 Inspect belt drive systems
- 3 Troubleshoot belt drive systems
- 4 Remove belt drive components
- 5 Select a belt for a belt drive system
- 6 Install a belt in a belt drive system



Wisconsin Technical College System

50-423-734 Gears, Gearboxes, Gear Assemblies for the MMMP Trades

Course Outcome Summary

Course Information

Description Course compares gear types and applications. Apprentices will develop skills inspecting gear assemblies, troubleshooting gear problems, removing gears and components, and reassembling gear drive systems. This course was formerly the M-5 module in related instruction for the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Examine different gear types and their applications
- 2 Inspect gear assemblies
- 3 Troubleshoot gear and related problems
- 4 Remove gears and related drive components
- 5 Reassemble gear assemblies



Wisconsin Technical College System

50-423-735 Mechanical Power Transmission for the MMMP Trades

Course Outcome Summary

Course Information

Description Course examines drive transmission systems and their applications, including roller chains. Apprentices will develop skills inspecting power transmission systems and troubleshooting mechanical drive systems. This course was formerly the M-6 module in related instruction for the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Examine different drive transmission types and their applications
- 2 Examine different types of roller chains and their related components
- 3 Inspect transmissions and components
- 4 Troubleshoot mechanical drive systems



Wisconsin Technical College System

50-423-736 Conveyors for the MMMP Trades

Course Outcome Summary

Course Information

Description Course examines chain, belt, and other types of conveyors and related components. This course was formerly the M-7 module in related instruction for the MMMP apprenticeship programs.

Total Credits 0.25

Course Competencies

- 1 Examine chain conveyors and their related components
- 2 Examine belt conveyors and their related components
- 3 Examine other conveyor types and their related components



Wisconsin Technical College System

50-423-737 Equipment Installation for the MMMP Trades

Course Outcome Summary

Course Information

Description Apprentices will layout equipment installations, plan for moving equipment, and set and level equipment. This course was formerly the M-8 module for related instruction in the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Layout equipment installation
- 2 Move equipment
- 3 Set and level equipment



Wisconsin Technical College System

50-423-738 Sheet Metal and Structural Steel Fabrication for the MMMP Trades

Course Outcome Summary

Course Information

Description Course compares types of sheet metal and tools used by the trade. Apprentices will develop skills related to fabricating sheet metal and structural steel and then erecting structural steel. This course was formerly the M-9 module in related instruction for the MMMP apprenticeship programs.

Total Credits 0.75

Course Competencies

- 1 Examine different types of sheet metal and sheet metal tools
- 2 Fabricate using sheet metal
- 3 Install fabricated sheet metal
- 4 Fabricate using structural steel
- 5 Erect structural steel