HARMEL ACADEMY
OF THE TRADES

Program Catalog

2025-2026

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Board of Trustees

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Academic Calendar 2025-2026

Fall Term		**Spring Term**	
Aug 12, 2025	Move-in/Orientation Week	Jan 5, 2026	First Day of Class *(tuition due)*
Aug 18, 2025	First Day of Class *(tuition due)*	Feb 17, 2026	Leon Harmel's Birthday *(honorific)*
Sept 1, 2025	Labor Day *(no class)*	Mar 30 - Apr 3, 2026	Holy Week/ Spring Break *(no class)*
Oct 4, 2025	Shoptoberfest *(Open House & Alumni Homecoming)*	Apr 6, 2026	Easter Monday *(no class)*
Nov 24-28, 2025	Thanksgiving Break *(no class)*	Apr 30, 2026	Springtime Inquisition
Dec 11, 2025	Yuletide Inquisition	May 1, 2026	End of Spring Term
Dec 12, 2025	End of Fall Term	May 2, 2026	Commencement
Dec 15, 2025	Christmas Break begins *(no class)*	May 3, 2026	24-Minutes of Harmel *(go kart race)*

PROGRAMS AT HARMEL ACADEMY

Foundations of Skilled Stewardship Program

The Foundations of Skilled Stewardship is a one-year program designed to expose students to multiple trades so that students can build a core foundation of skills and knowledge that can assist in life and discernment of future career paths.

FSS 090: Introduction to Skilled Trades and Safety
FSS 091: Introduction to Construction
FSS 092: Introduction to Electrical
FSS 093: Introduction to HVAC and Plumbing
FSS 094: Introduction to Metal Fabrication- I Blacksmithing
FSS 095: Introduction to Metal Fabrication- II Welding
FSS 096: Introduction to Carpentry and Home Maintenance
FSS 097: Automotive/PM
FSS 098: Machine Tool Operation
FSS 099: Introduction to Small Engines
TRA 101: Introduction to Computers/Workplace Communication
FSS 110: Work as Service and Stewardship I
FSS 111: Work as Service and Stewardship II
FS 101: Formation Seminar I
FS 102: Formation Seminar II
HUM 201: God and Man at Work I
HUM 202: God and Man at Work II

Total Credits: 42

Electrical Program

The electrical program at Harmel teaches the related technical instruction (RTI) in a balanced manner between book work and practical Hands-On laps. In addition to receiving all your RTI needed for the apprenticeship, Harmel also preps students for taking the journeyman electrical license test. Along with all technical training, the electrical program is still coupled with the formation and humanities classes.

ELE 100s: Introduction to Electrical Work
ELE 200s: Codes
ELE 300s: Intermediate Electrical

ELE 400s: Advanced Electrical
HUM 203: God and Man at Work III
HUM 204: God and Man at Work IV
FS 101: Formation Seminar I
FS 102: Formation Seminar II

Total Credits: 68 The prerequisite for this program is completion of the FSS program.

Machine Builder

The Machine Builder program is a versatile path choice. A Harmel student that completes the MST program can choose one of two different career paths as either a machine builder or a maintenance technician. As a machine builder, an individual would be building or assembling new manufacturing equipment. Primarily a problem solver-inventor. As a maintenance technician, an individual would ensure continued running of manufacturing equipment. Primarily a problem solver-diagnostic-troubleshooter.

TRA 101: Introduction to Computers/Workplace Communication
MST 101: Fluid Power, Electrohydraulics, and Pneumatics
MST 102: General Preventative Maintenance and Predictive Maintenance
MST 104: Blueprint Reading, Schematics, and Computer Assisted Design (CAD)
ELE 107: Basic Electricity
MST 108: Mechanical Drive Systems
TRA 109: Safety
WLD 110: Basic Welding and Fabrication
MST 120: Machine Tool Operations
MTH 201: Math for Tradesmen
MST 205: Robotics
MST 203: Programmable Logic Controllers (PLC)
MST 206: Controls
HUM 203: God and Man at Work III
HUM 204: God and Man at Work IV
FS 101: Formation Seminar I
FS 102: Formation Seminar II

Total Credits: 62 The prerequisite for this program is completion of the FSS program.

Machinist

The Machinist program provides an individual with knowledge for the proper operation of a CNC machine along with an understanding of CNC programs, g-code programming, tooling, and work holding.

TRA 101: Introduction to Computers/Workplace Communication
MST 101: Fluid Power, Electrohydraulics, and Pneumatics
MST 102: General Preventative Maintenance and Predictive Maintenance
MST 104: Blueprint Reading, Schematics, and CAD
ELE 107: Basic Electricity
MST 108: Mechanical Drive Systems
TRA 109: Safety
WLD 110: Basic Welding and Fabrication
MST 120: Machine Tool Operations
MTH 201: Math for Tradesmen
MST 205: Robotics
MST 240: Advanced Machine Tool Operations
MST 242: Computer-Aided Manufacturing
HUM 203: God and Man at Work III
HUM 204: God and Man at Work IV
FS 101: Formation Seminar I
FS 102: Formation Seminar II

Total Credits: 62 The prerequisite for this program is completion of the FSS program.

Welding

This program is designed to prepare students to take their G3 welding certification learning both concepts and advanced techniques in welding for a wide range of welding career paths.

MST 104: Blueprint Reading, Schematics, and CAD
TRA 109: Safety
WLD 110: Basic Welding
WLD 210: Advanced Welding
WLD 310: Intro to Fabrication
MTH 201: Math for Tradesmen
MST 205: Robotics
HUM 203: God and Man at Work III
HUM 204: God and Man at Work IV
FS 101: Formation Seminar I

FS 102: Formation Seminar II

Total Credits: 29 The prerequisite for this program is completion of the FSS program.

Workman in Residence

The Workman in Residence program is designed for a Harmel student who wants to stay in the Harmel community and continue building his spiritual life and character. A workman in residence will seek a career and/or technical training from outside of Harmel while still receiving Humanities and faith formation from Harmel.

HUM 203: God and Man at Work III
HUM 204: God and Man at Work IV
FS 101: Formation Seminar I
FS 102: Formation Seminar II

Total Credits: 8 The prerequisite for this program is completion of the FSS program.

COURSE LIST

FSS 090: Introduction to Skilled Trades and Safety

Introduction to the Skilled Trades lays a foundation of knowledge and practices that subsequent FSS courses build on.

Objectives and Outcomes

At the end of this course, students should understand the landscape of the skilled trades in the construction and manufacturing industries. Students will:

- Help sustain life.
- Minimize the consequences of injury or sudden illness to meet the various training needs of those in the workplace, school, or community settings.
- Understand the importance of working safely and complying with multiple regulatory requirements.
- Understand the role of jurisdictions in the regulation of professional trades.
- Know the importance of and use of industry standards.
- Be able to identify and use a wide range of common hand tools.
- Be able to identify and know the application of a wide range of the most common fasteners.

Credits: 2
Offered Fall Semester Cross-listed: TRA 109

Note: This class may be articulated.

FSS 091: Introduction to Construction

Introduction to Construction provides students with the knowledge and skills found in residential and commercial construction.

Objectives and Outcomes

At the end of this course, students should be able to begin competently and safely working on a construction site. Students will:

- Learn to safely use the most common construction tools and equipment.
- Identify and use typical construction materials, including lumber, sheet goods and masonry.
- Learn and demonstrate essential construction skills, including layout, handling, fastening, and cutting.
- Build a small structure with typical materials and methods.
- Learn and identify materials and design of structural sub-assemblies such as trusses, walls, floors and roofs.

Credits: 3
Offered Fall Semester

FSS 092: Introduction to Electrical

The Electrical course teaches students the safe practice of designing, installing, and repairing typical building electrical systems, both full and low voltages, and controls.

Objectives and Outcomes

At the end of this course, students should understand how building-wide electrical systems are designed and operate. Students will:

- Design and install electrical circuits.
- Learn how to identify the main components of electrical distribution systems.
- Identify and use common devices and materials such as switches, outlets, sheathed cables, and fixtures.
- Learn to diagnose and repair common electrical faults.
- Learn to make simple improvements and alterations of existing electrical systems.

Credits: 4
Offered Fall Semester Cross Listed: ELE 107
Note: This class can be split over 2 semesters as parts A and B

FSS 093: Introduction to HVAC and Plumbing

The HVAC and Plumbing course will introduce students to the skills, equipment, and materials for heating, ventilation, air conditioning and plumbing systems for typical buildings.

Objectives and Outcomes

At the end of this course, students should understand not only the physical principles of heating, cooling, and hydraulic systems but how they are planned, installed and maintained. Students will:

- Learn how air and water is efficiently heated and cooled.
- Learn how distribution systems for water, air, sewer and hydronics are designed.
- Learn the role of specific building Codes for safely maintaining health and hygiene.
- Understand the integration of control systems in HVAC.
- Learn and demonstrate common maintenance procedures for furnaces, air conditioners, water, and sewer systems.
- Identify common components and fixtures in a home HVAC and plumbing system.

Credits: 2
Offered Fall Semester

FSS 094: Introduction to Metal Fabrication- I Blacksmithing

This course will cover fabrication and blacksmithing practice for the means of making both functional and nonfunctional objects. The course will cover basic techniques for welding, cutting, forging, cold and hot fastening, and finishing of steel.

Objectives and Outcomes

- Learning correct and safe forge operation;
- Correct anvil use;
- Gain a basic understanding of forging tools;
- Understand how to manipulate metal (hot/cold);
- Learning how to harden metal.

Credits: 2
Offered Fall Semester

FSS 095: Introduction to Metal Fabrication- II Welding

Metal Fabrication introduces students to equipment and filler metals used to produce a welded joint. Welding principles will be introduced along with the metallurgy of steel and welding.

Objectives and Outcomes

Techniques taught in this course include cutting, brazing, and welding. By the end of the course, students will have an understanding of:

- Shielded metal arc welding safety.
- Shielded metal arc welding processes including flat, horizontal, and vertical
- Theory, safety practices, equipment, and techniques required for gas metal arc welding including different transfer methods and position welding.
- Oxy- fuel cutting, including safety, and setup of oxy-fuel cutting equipment.

Credits: 4
Offered Fall Semester Cross Listed: WLD 110
Note: This class can be split over 2 semesters as parts A and B

FSS 096: Introduction to Carpentry and Home Maintenance

This course will teach students how to use basic tools to gain competency in basic woodworking skills, as well as confidence in the repair and maintenance of their home and property.

Objectives and Outcomes

At the end of this course, students should be comfortable identifying and selecting wood, using and maintaining certain tools, and demonstrating basic woodworking skills. At the end of this course, students should be comfortable performing basic remodels, maintaining home appliances, and diagnosing common issues.
Students will:

- Learn how lumber is made.
- Demonstrate how to use basic carpentry tools with competence.
- Learn the physical properties of wood and to identify wood products.
- Demonstrate basic wood finishing .
- Demonstrate the correct way to sharpen saws and chisels.
- Learn preventive maintenance.
- Demonstrate repair on common faults.
- Learn to identify hazards and needs.
- Demonstrate knowledge of the physics of coating.
- Learn when to call a professional.
- Learn and demonstrate the proper use of chemicals.

Credits: 3
Offered Fall Semester

FSS 097: Automotive/Preventative Maintenance

The Automotive course teaches basic automotive systems with a focus on repair and maintenance.

Objectives and Outcomes

At the end of this course, students will be comfortable running a diagnostic on a vehicle (especially their own!) and performing basic repairs and maintenance.

Students will:

- Learn to identify basic car components and systems.
- Demonstrate an understanding of differences among FWD, 4WD, AWD, and various vehicle types.
- Learn how gas, diesel, and electric cars work.
- Demonstrate an understanding of small engines.
- Learn to change the oil, change a tire, and disassemble and reassemble a small engine.
- Demonstrate how to run a diagnostic.
- Learn how to do regular routine cleaning, lubricating, testing, checking for wear and tear and eventually replacing components to avoid breakdown.
- Learn the various types and styles of predictive and preventive maintenance components, principles, and practices used in industrial applications.

Credits: 2

Offered Fall Semester

Cross Listed: MST 102

FSS 098: Machine Tool Operation

Students will work with various measuring and layout tools found in industrial environments and be introduced to machining operations. The class focuses on the safe application of the most common machining procedures and machines used by multi-skilled industrial maintenance technicians. Introduces safe operation of lathes, primarily engine and tool room lathes. Addresses various types of lathes used in industry, their component parts, and associated safety precautions. Emphasizes the most common lathe operations required by multi-skilled industrial maintenance technicians. Introduces safe operation of milling machines, primarily vertical milling machines.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Machining operations, procedures, and machines used by multi-skilled industrial maintenance technicians.
- The safe and correct operation of lathes, milling machines, drill presses, metal saws, hand tools, and power tools.
- How to use power tools properly.
- How to perform basic and precision measurement.
- How to perform basic and precision layouts.

- Set up and machine operation.

Credits: 4
Offered Fall Semester Cross Listed: MST 120
Note: This class can be split over 2 semesters as parts A and B

FSS 099: Introduction to Small Engines

Introduces students to the field of small engine repair as a career path and gives them a basic understanding of small engine use in a home-setting as a homeowner.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Typical Small Engine Maintenance and Repair Tasks;
- Safety in the Small Engine Shop;
- Tools and Measuring Instruments;
- Fasteners; Sealants; Gaskets;
- Two-Cycle and Four-Cycle Engines;
- Engine Components;
- Carburetion;
- Ignition Systems;
- Lubrication Systems;
- Cooling Systems.

Credits: 2
Offered Fall Semester

FSS 110: Work as Service and Stewardship I

Work as Service and Stewardship is a practical seminar in the essentials of ***how to work*** (work ethics, technique, time and resource management, etc.) in the context of ***why we work*** (the vocation to collaborate with God in the creation and redemption of the world, service to one's family, neighbor, community, and church, etc.) Instruction is blended into a series of discussions, practicums, and service projects on and off campus, with a special emphasis on teaching men how to be proactive, willing, and eager servant-leaders and stewards of their communities.

Objectives and Outcomes

Students will:

- Learn the virtues — practical and ethical — of effective workmanship, work ethic, and commitment to excellence.

- Learn the methods to plan work, set goals, analyze its effectiveness, and offer it practically to Christ in prayer.
- Learn techniques for anticipating and clarifying the intent of a coach, mentor, employer, or foreman, as well as for navigating with character and grace on-the-job conflicts, with co-workers, direct reports, and employers.
- Design a plan for proactive career pathing.

Credits: 3
Offered Fall Semester

FSS 111: Work as Service and Stewardship II

Building on the lessons of FSS 101, FSS 102 continues practical instruction in Work as Service and Stewardship, but with the added dimension of student leadership, project management, and initiative. Instruction is blended into a series of discussions, practicums, and service projects on and off campus, with a special emphasis on teaching men how to be proactive, willing, and eager servant leaders and stewards of their communities.

Objectives and Outcomes
Students will learn to:

- Identify, plan, coordinate, execute, and analyze the effectiveness of service projects under the mentorship of course instructors and mentors.

Credits: 3
Offered Spring Semester
Prerequisite: FSS 110

HUM 201: God and Man at Work I

God and Man at Work I examines selections of literature, film, drama, history, theology, and philosophy to establish a context to consider the question "What does it mean to be human?" and to base the exploration of that question on the life, work, and eucharistic presence of Jesus Christ.

Objectives and Outcomes
At the end of this course, students should have a stock of literary, historical, philosophical, and theological images to help them:

- Understand work as a precursor to man's priestly calling to offer thanksgiving to God.
- Understand how Jesus Christ fulfills that call, both revealing God to Man and Man to himself.
- Understand how the relationship between freedom and discipline animates our apprenticeship to Christ in his redemptive work in the world.
- Understand the four cardinal virtues, the three theological virtues, and how an understanding of the evangelical counsels can help situate the virtues in our habits.

Credits: 3
Offered Fall Semester

HUM 202: God and Man at Work II

God and Man at Work II examines selections of literature, film, drama, history, theology, and philosophy to establish a context to continue exploring the question "What does it mean to be human?", specifically in man's vocation to his family, his creativity, and his community.

Objectives and Outcomes

At the end of this course, students should have a stock of literary, historical, philosophical, and theological concepts and images to help them:

- Understand the hylomorphic language of the body, and how it reveals man's spousal meaning, illuminates his call to generation and procreation, and "signs" the divine life of the Trinity.
- Understand how man's creative vocation and agency itself bears the signs of the life of the Trinity and orients us toward adoration of God.
- Understand how man's call to generate, create, and cultivate a home illuminates both the universal destination of goods and the universal call to holiness, and thereby, offers a path of practical virtue in his life of family, work, society, and politics.

Credits: 3
Offered Spring Semester

HUM 203: God and Man at Work III

God and Man at Work III examines selections of literature, film, drama, history, theology, and philosophy to establish an imaginative context to explore the question "How is man to live out his callings in community?," specifically with regard to the Church's social doctrines on political economy.

Objectives and Outcomes

At the end of this course, students should have a stock of literary, historical, philosophical, and theological concepts and images to help them:

- Encounter and employ integrated humanities (literature, philosophy, theology, history, film) — and build on their understanding of the Gospel of Work from HUM 201 and HUM 202 — as a method, means, and resource for forming one's imagination with regard to the universal call to holiness.
- Learn to contextualize, define, and develop an imaginative grounding for the key concepts of Catholic Social Teaching.
- Develop grounds for understanding the relationship between work, family, society, and the Kingdom of God.

Credits: 3
Offered Fall Semester

HUM 204: God and Man at Work IV

God and Man at Work IV examines selections of literature, film, drama, history, theology, and philosophy to establish an imaginative context to explore the question "How is our work perfected by the divine presence?," specifically with regard to prayer-work integration, prolepsis, and death.

Objectives and Outcomes

At the end of this course, students should have a stock of literary, historical, philosophical, and theological concepts and images to help them:

- Encounter and employ integrated humanities (literature, philosophy, theology, history, film) — and build on their understanding of the Gospel of Work from HUM 201 through HUM 203 — as a method, means, and resource for forming one's imagination with regard to the universal call to holiness.
- Learn to contextualize, define, and develop an imaginative grounding for the habit of integrating prayer and work.
- Define and develop an imaginative theology of the kingdom of God.
- Develop grounds for understanding the relationship between work, prolepsis, waiting, festivity, hope, and death.

Credits: 3
Offered Spring Semester

FS 101: Formation Seminar I

We provide an opportunity for young men to experience a deep encounter with Jesus Christ through prayer, brotherly fraternity, work, and study. Our Formation Program consists of Priestly fatherhood formation and Benedictine Spirituality, Ora et Labora! Our students pray Lauds, Vespers, and Compline daily and have access to spiritual direction from men with real-world fatherly family and working experience. They also have access to a priest who offers spiritual direction, the sacrament of confession, and the Holy Sacrifice of the Mass on Wednesday evenings, followed by a formation session with a guest speaker.

Credits: 1
Offered Fall Semester

FS 102: Formation Seminar II

Formation Seminar II is a continuation of Formation Seminar I, with the coupling of mentors from the local community. The mentors are picked for the students by our formation team. The students still have formation

sessions with guest speakers and access to a priest who offers spiritual direction, the sacraments of confession, and the Holy Sacrifice of the Mass.

Credits: 1
Offered Spring Semester

TRA 101: Introduction to Computers/Workplace Communication

TRA 101 lays out general workplace communication expectations, introduces students to workplace communication platforms and systems, and shows students hazards that exist in workplace communications. The course also introduces students to typical computers and systems found in the manufacturing industry and familiarizes them with computer hardware and software.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Proper ways to communicate using a computer via email or other communication programs.
- The multiple ways computers can help keep information and databases straight.
- Operating systems and how to install them on computers in addition to covering basic networking for CNC machines.

Credits: 2
Offered Fall Semester

MST 101: Fluid Power, Electrohydraulics, and Pneumatics

MST 101 explains the fundamental concepts of fluid power and electro-fluid power systems, addressing fluids, filters, reservoirs, piping, pumps, actuators, accumulators, control valves, and combination circuits.

Objectives and Outcomes

By the end of the course, students should have an understanding of:

- The principles of fluid power;
- Calculations of the physical properties of fluids;
- The ability of fluids to do work;
- The various fluid power components, symbols, and circuits;
- The troubleshooting of fluid power components and systems with an emphasis on safety.

Credits: 6
Offered Fall Semester

MST 102: General Preventative Maintenance and Predictive Maintenance

MST 102 introduces how routine work is done to keep equipment in good working order and to optimize its efficiency and accuracy.

Objectives and Outcomes

By the end of the course, students should have an understanding of:

- Regular routine cleaning, lubricating, testing, checking for wear and tear and eventually replacing components to avoid breakdown.
- The various types and styles of predictive and preventive maintenance components, principles, and practices used in industrial applications.

Credits: 2
Offered Fall Semester

MST 104: Blueprint Reading, Schematics, and CAD

MST 104 introduces the fundamental information in drafting necessary to retrieve, read, manipulate and understand a mechanical part print. Students are introduced to dimensioning, tolerances, threads and fasteners, as well as basic functions in CAD (computer aided drafting) necessary to manage files.

Objectives and Outcomes

By the end of the course, students should be able to:

- Recognize, identify, describe, and relate the components used in schematics, along with their symbols and connectors.
- Describe electrical, electronics, pneumatics, hydraulics, and piping circuits, as well as welding and joining symbols interpretation.
- Interpret and create mechanical drawings.
- Use Mastercam to create 3-D models, single and multiview drawings using proper view position, auxiliary views, and section views.

Credits: 2
Offered Spring Semester

ELE 107: Basic Electricity

ELE 107 introduces the various elements of basic electricity concentrating on control logic components and circuit function and introduces the student to solid state devices and applications.

Objectives and Outcomes

By the end of the course, students will be able to:

- Identify electrical symbols.
- Interpret schematics.
- Cross reference prints.
- Trace circuits.
- Interpret sequential function charts, line drawings, and time charts.
- Use electrical measurement instruments, including digital and analog multimeters, clamp-on ammeters, megohmmeters, and the oscilloscope.

Credits: 4
Offered Fall Semester

MST 108: Mechanical Drive Systems

MST 108 introduces safety, maintenance techniques and procedures used to maintain industrial equipment, including industrial couplings, chains, sprockets, belts, bearings, shafts, brakes, clutches, gears, and cams.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- The principles of power transmission.
- Calculations of speed and force.
- How speed and force affect a power transmission system.

Credits: 5
Offered Spring Semester

TRA 109: Safety

TRA 109 introduces OSHA and the OSHA regulations that apply to the auto manufacturing industry, and the safety rules and issues in the use of overhead cranes, hoists, rigging equipment, attachment components, calculating sling angle stresses, and safe lifting and turning loads.

Objectives and Outcomes

By the end of the course, students will understand how to:

- Help sustain life.
- Minimize the consequences of injury or sudden illness to meet the various training needs of those in the workplace, school, or community settings.
- Describe Introduction to OSHA and Hazard Identification.

- Inspect personal protective equipment.
- Use a ladder and walk a walkway safely.
- Identify types of fires.

Credits: 2
Offered Fall Semester
Note: This class may be articulated.

WLD 110: Basic Welding and Fabrication

WLD 110 introduces the power sources used in shielded metal arc welding (SMAW) and gas metal arc welding (GMAW), along with equipment and filler metals used to produce a welded joint. Welding principles will be introduced along with the metallurgy of steel and welding.

Objectives and Outcomes

Techniques taught in this course include cutting, brazing, and welding. By the end of the course, students will have an understanding of:

- Shielded metal arc welding safety.
- Shielded metal arc welding processes including flat, horizontal, vertical, and overhead welding techniques.
- Theory, safety practices, equipment, and techniques required for gas metal arc welding including different transfer methods and position welding.
- Oxy- fuel welding and cutting, including safety, setup and maintenance of oxy-fuel welding and cutting equipment.

Credits: 4
Offered Fall Semester

WLD 210: Advanced Welding

WLD 210 builds on an introductory understanding of basic Metal Fabrication. The course consists of learning and applying the basics of welding principles learned in WLD 110 in a lab setting. Personal Protective Equipment, safety, metal grinding, Gas and Plasma cutting along with MIG, ARC, TIG, and Oxy-Acetylene welding will be the primary platforms applied in this class. Students will be given a project to fabricate designed by the instructor using WLD 110 objectives along with blueprint reading, layout, and jig building.

Objectives and Outcomes

Students after having completed this course should be able to successfully:

- Identify, operate and maintain all welding machines and safety equipment, grinders, tools, saws, fume extractors, cutting torches, etc. in the lab.
- Set welders to their proper settings based on material type and thickness prior to welding.

- Properly prepare material before welding.

By the end of the course, students are expected to have:

- An understanding of welding symbols and types that identify weld lengths, sizes, and positions.
- The capacity toward basic proficiency of metal fabrication.

Students will be evaluated on:

- Tolerance and fabrication quality.
- Knowledge of and ability to fully prep and fabricate a weld coupon for mock testing using welding techniques, GMAW and SMAW simulating the completion for an AWS D1.1 3G certification.

Credits: 3
Offered Fall Semester

WLD 310: Intro to Fabrication

In this class the student is instructed in advanced welding and metal fabrication. The first part of the class consists of applying and deepening welding techniques learned in the prerequisite courses WLD 110 and WLD 210. This is executed through three primary areas of metal fabrication: Structural, Miscellaneous and Architectural metal fabrications. This is combined with blueprint reading, weld types, and symbol identification. Small projects, such as welding base plates to beams, channels, and angles, supplement the students' learning experience. Students fabricate and install steel railings as practical use experience. And finally, students weld an architectural fabrication consisting of nonferrous metals.

Objectives and Outcomes

By the end of the course, students will have a deepening understanding of:

- Welding techniques using GMAW, SMAW, GTAW, FCAW;
- Blueprint reading, Weld symbol recognition;
- Layout for fabrication;
- Installation of a miscellaneous fabricated product;
- The difference between Structural, Miscellaneous, and Architectural metal fabrications

Credits: 3
Offered Spring Semester

MST 120: Machine Tool Operations

In MST 120, students work with various measuring and layout tools found in industrial environments. This class introduces machining operations and focuses on the safe application of the most common machining procedures and machines used by multi-skilled industrial maintenance technicians. Students are introduced to the safe operation of lathes, primarily engine and tool room lathes. This course addresses the various types of

lathes used in industry, their component parts and associated safety precautions, and emphasizes the most common lathe operations required by multi-skilled industrial maintenance technicians. Students learn the safe operation of milling machines, primarily vertical milling machines.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Machining operations, procedures, and machines used by multi-skilled industrial maintenance technicians.
- The safe and correct operation of lathes, milling machines, drill presses, metal saws, and hand and power tools.
- How to use power tools properly.
- How to perform basic and precision measurement.
- How to perform basic and precision layouts.
- Set up and machine operating

Credits: 4
Offered Fall Semester

MTH 201: Math for Tradesmen

Math 201 introduces students to the fundamental concepts of algebra, geometry, and trigonometry that are employed in basic machining, machine repair, and fabrication. Students learn and employ these skills through project-based learning and mastery in collaboration with WLD 210: Intermediate Welding and Fabrication.

Objectives and Outcomes

By the end of the course, students will be able to apply fundamental concepts of algebra, geometry, and trigonometry to:

- Basic machining.
- Machine repair.
- Fabrication.

Credits: 3
Offered Spring Semester

MST 205: Robotics

MST 205 introduces robotics with regards to industrial robotic safety standards, applications, types of classes for industrial robots, basic system components, robotic motion concepts, key programming techniques, and definitions of common terms associated with computer integrated manufacturing (CIM) as it relates to robotic cells.

Objectives and Outcomes

By the end of the course, students should have an understanding of these concepts:

- Preventive maintenance techniques required for a robot and their backup systems.
- Recovery procedures needed to interpret robot error codes and perform a safe recovery start up procedure on robotics equipment.
- Integrating robotic applications in a PLC-controlled, automated system.

Credits: 4
Offered Spring Semester

MST 203: PLCs

MST 103 introduces Programmable Logic Controllers (PLC) and elements needed for an automated industrial control system.

Objectives and Outcomes

This course requires the student to program a PLC which may include a combination of ladder logic, structured text, sequential function chart and/or function block languages, and it includes various protocols of industrial communications used between PLC controlled machines, PLC to PLC, PLC to computer, and computer to computer. By the end of the course, students will have an understanding of:

- Memory and project organization within a PLC.
- Basic numbering systems, computer and PLC terminology and PLC control functions, program structures, language standards, wiring and troubleshooting methods, as well as real world communications.

Credits: 5
Offered Spring Semester

MST 206: Controls

MST 206 covers the diversity of control devices including: theory of operation, applications in automation control and troubleshooting and repair. This course introduces identification, installation, replacement, and troubleshooting of automation controller circuit boards and modules.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- The installation, maintenance and troubleshooting of common input devices.
- Methods of motor controls including on-off, proportional, integral, and derivatives including PID loop tuning and quality are discussed.

- Automation output devices including AC, DC, and servo motors, variable speed drives, relays, motor starters, and sizing of components for various applications is also covered.

Credits: 5
Offered Spring Semester

MST 240: Advanced Machine Tool Operations

This course prepares students to program and operate a computer numerical controlled (CNC) machine tool by utilizing the computer-aided manufacturing (CAM) software package, Mastercam.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Safety procedures
- Program format
- Classroom/shop expectations
- Process planning from part prints
- Basic CNC machine types
- Fundamentals of CNC Machining
- The format, sequence, and requirements of a CNC program
- How to write, simulate, and debug a CNC program
- How to key-in, upload, download, edit, and save CNC programs at the machine controller

Credits: 5
Offered Spring Semester

MST 242: Computer Aided Manufacturing (CAM)

This course introduces and familiarizes students with software that can create instructions in a language (G-code) that industrial machinery understands to manufacture physical products. Students learn to translate CAD designs to program CNC machines to create physical 3D objects.

Objectives and Outcomes

By the end of the course, students will have an understanding of:

- Selecting/setting proper tooling and work offsets
- Execution of a CNC program using graphical confirmation, rapid overrides, and dry-runs
- CAM Software – Mastercam – Machining Center
- Part drawing
- Toolpath creation
- Toolpath simulation
- Post processing

- Program upload
- Program/part runoff

Credits: 5
Offered Spring Semester

ELE 100s: Introduction to Electrical Work

Upon the completion of ELE 100s, students will possess the knowledge necessary to safely and proficiently perform the job duties and responsibilities expected of a new electrical apprentice.

Objectives and Outcomes

By the end of the course, students will have:

- Built a foundation of knowledge about construction safety, electrical safety, and electrical theory that's necessary to understand the National Electrical Code (NEC).
- An understanding of the Code rules that are related to general wiring requirements, outlet box sizing, raceway sizing, bonding and grounding.
- An understanding of how a multimeter is used in the field and receive a multimeter competency certification.

Credits: 12
Offered Fall Semester

ELE 200s: Codes

Upon the completion of ELE 200s, the student will develop a further knowledge of construction safety, electrical safety, and chapters one through three of the National Electrical Code. The students' study of the rules in the first three chapters of the NEC will give them a greater understanding of the purpose of the Code's general wiring methods, materials, and different types of protection along with developing a deeper understanding of residential and commercial wiring systems.

Objectives and Outcomes

By the end of the course, students have a deeper understanding of:

- Construction safety, electrical safety, and electrical theory to understand the National Electrical Code (NEC).
- Code rules related to general wiring requirements, outlet box sizing, raceway sizing, and bonding and grounding.
- Residential and commercial wiring systems.

Credits: 12
Offered Spring Semester

ELE 300s: Intermediate Electrical

Upon the completion of ELE 300s, the student continues building a foundation of knowledge about construction safety, electrical safety, and the National Electrical Code. While motors and controls are the major focus area, hazardous locations, special applications, and Solar (PV) Photovoltaic and Energy Storage Systems are also introduced.

Objectives and Outcomes

Students will have an understanding of:

- Motors and controls.
- Hazardous locations.
- Special applications.
- Solar Photovoltaic (PV) and Energy Storage Systems.

Credits: 12
Offered Fall Semester

ELE 400s: Advanced Electrical

Upon the completion of ELE 400s, students have developed a further knowledge of construction safety, electrical safety, the NEC in preparation for their exam, covering advanced Code calculations in great detail. Students also gain an understanding of some basic leadership principles necessary to excel on the job and be introduced to fire alarm system basics.

Objectives and Outcomes

Students will have an understanding of:

- Leadership principles.
- Fire alarm system basics.

Credits: 12
Offered Spring Semester

TRANSFER CREDIT POLICY

Purpose

The purpose of this policy is to establish guidelines for evaluating and accepting academic credit earned by students at other institutions of higher learning. This policy ensures that all transfer credits meet Harmel Academy's academic standards and align with program requirements.

Scope

This policy applies to all prospective and current undergraduate students seeking to transfer academic credits from other colleges, universities, and other approved learning experiences.

Criteria for accepting transfer credit

Because Harmel Academy accepts transfer credit on an individual's case by case basis.

Accreditation

The sending institution must be accredited by a U.S. Department of Education-recognized accrediting agency (e.g., a regional or national accrediting body). Credits from international institutions may be considered if the foreign nation's ministry of education has approved the school.

Course content and equivalency:

- Equivalency: The courses must be substantially equivalent in content, rigor, and credit hours to courses offered at this institution.
- Review process: Harmel Academy's academic departments will review course descriptions, syllabi, learning objectives, and other materials to determine equivalency.
- Designation: Courses may be transferred as a direct equivalent (e.g., WLD 101), departmental elective credit (e.g., WLD 1XX), or not accepted if no equivalency exists.

Minimum grade requirements:

- A minimum grade of "C" (or equivalent) is required for a course to be eligible for transfer. Some academic programs may have higher requirements.
- Harmel Academy will accept "Pass/Fail" credit upon evaluation on a case by case basis with a Pass grade.
- Non-accepted grades: Courses with a grade of "D" or lower are generally not accepted for transfer credit.

Limitations on transfer credits:

- Maximum credits: A maximum number of credits may be transferred toward a certificate program. No more than 50% of the required credit hours can be transferred credits to complete the Harmel Academy program.
- Residency requirement: A minimum of 8 of credits must be completed in residency at this institution to fulfill the program, which may vary by program.
- Time limit: Credits may not be accepted for courses taken more than five years ago, particularly for specific fields where knowledge changes rapidly.

Evaluation process for transfer credit

1. Submit official transcripts: The student must request that official transcripts from all previous institutions be sent directly to Harmel Academy's Office of the Registrar, PO Box 6073, Grand Rapids, MI 49516
2. Credit evaluation: The Office of the Registrar conducts an initial review based on accreditation and minimum grade requirements. The appropriate academic department is consulted for specific course equivalencies.
3. Credit award: An official credit evaluation is completed and sent to the student. The evaluation indicates which credits were accepted and how they will be applied toward the student's program certificate requirements.
4. Appeal process: Students who wish to appeal a transfer credit decision may submit a written request to the Registrar's Office.

Credit for prior learning

- Non-traditional credit: Credit may be awarded for prior learning from sources such as military service (evaluated using ACE recommendations), national examinations (e.g., Advanced Placement or CLEP), and institutional examinations.
- Limitations: These credits are also subject to maximum transfer limits and are evaluated to ensure they meet the institution's learning outcomes.