## Minnesota Career Education Center
### Career Technical Education

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<th>FRB</th>
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## Post-Secondary:

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## Second Chance Pell Program

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## Second Chance Act Technology Careers Grant

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Faribault (FRB) • Lino Lakes (LL) • Moose Lake (ML) • Oak Park Heights (OPH) • Rush City (RC) • Shakopee (SHK) • St. Cloud (SCL) • Stillwater (STW) • Willow River (WR) • Togo (TOGO)
CABINETMAKING

Locations: FRB, STW

Program Focus:
This program focuses on basic fundamentals of cabinetry and furniture construction. With three opportunities for certificates and/or diplomas, the sequential stacking of hours provides for an intense training: basic cabinetry certificate is 330 hours, cabinetmaking diploma combined 510 hours, and advanced cabinetmaking diploma is 735 hours. Skill areas include the use of hand and power tools, lamination, and the design of kitchen cabinets and furniture. The Cabinetmaking programs will utilize National Center for Construction Education and Research (NCCER) industry recognized curriculum. Students who complete a diploma and demonstrate aptitude may be recommended for enrollment in the Advanced Cabinetmaking certificate program, where they will design and build cabinets for resale. The program is designed to provide students with the skills required to enter a first year apprenticeship or to explore other opportunities in the cabinetry field.

Entrance Requirement:
Basic Cabinetry Certificate – Reading and Math at 9th grade level or higher (TABE 9.0 or higher)
Cabinetmaking Diploma – Basic Cabinetry Certificate
Advanced Cabinetmaking Diploma – Cabinetmaking Diploma

Physical Demands: Must be able to lift 55 pounds

Awards Offered:
Basic Cabinetry Certificate 330 Hours
Cabinetmaking Diploma 510 Hours
Advanced Cabinetmaking Diploma 735 Hours

Awarding Establishment: Century College

Basic Cabinetry Certificate

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<td>GSHR 1000</td>
<td>Workplace Human Relations</td>
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<tr>
<td>CABT 1010</td>
<td>Construction Math</td>
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<tr>
<td>CABT 1020</td>
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<tr>
<td>CABT 1030</td>
<td>Basic Joinery</td>
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<tr>
<td>CABT 1040</td>
<td>Wood Identification</td>
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<tr>
<td>CABT 1050</td>
<td>Introduction to Machines &amp; Power Tools</td>
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<tr>
<td>CABT 1060</td>
<td>Casework Construction</td>
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<tr>
<td>CABT 1070</td>
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Cabinetmaking Diploma

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<th>Course</th>
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<td>CABT 2010</td>
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<tr>
<td>CABT 2020</td>
<td>Cabinet &amp; Furniture Design &amp; Layout</td>
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<tr>
<td>CABT 2030</td>
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Advanced Cabinetmaking Diploma

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<td>Advanced Cabinet &amp; Furniture Construction</td>
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<tr>
<td>CABT 3040</td>
<td>Advanced Cabinet &amp; Furniture II</td>
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Program Courses:

GSRR 1000 Workplace Human Relations
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

CABT 1010 Construction Math 30 Hours
This course is designed to teach students mathematical calculations related to the field of cabinetmaking. Students will solve basic math problems (using algebra and geometry) with and without a calculator. Students will solve equations, using board, linear, foot, square-foot, and cubic-foot measurements. (NCCER Module 00102)
Prerequisite: None

CABT 1020 Hand Tools 30 Hours
This course is designed to prepare students for safe operation of hand and power tools used in the cabinetmaking industry. Students will be introduced to shop safety, identification, use and care of hand and power tools. (NCCER Modules 00103, 00101, 00106, 00109, 27501)
Prerequisite: None

CABT 1030 Basic Joinery 30 Hours
This course is designed to provide students with the knowledge of fundamental cabinetmaking joinery. Students will be exposed to lab projects that reinforce theory topics. Students will learn the skills necessary to become proficient in a variety of joinery types. Content topics include: flat and edge miters, dados, rabbets, mortise and tenon, pocket fasteners and joints. (NCCER Module 27501)
Prerequisite: None

CABT 1040 Wood Identification 30 Hours
This course gives the student hands-on experience and identifies the common wood species, both hardwood and softwood. Students will be exposed to the grading of lumber relating to the various levels of quality. The different uses of quality levels will be covered. Students will also learn the differences between an open-grain, to a closed-grain wood. (NCCER Module 27501)
Prerequisite: None

CABT 1050 Introduction to Machine & Power Tools 60 Hours
This course is designed to prepare students for the safe operation of machines and power tools used in the cabinetmaking industry. Students will demonstrate the appropriate set-up and operation along with the care of the machines and power tools. Student safety is paramount in this course. Students also learn the importance in wearing appropriate personal protective equipment. (NCCER Module 27501)
Prerequisite: CABT 1020 Hand Tools

CABT 1060 Casework Construction 60 Hours
This course exposes students to the basics of case construction. Students will use shop drawings and apply the appropriate procedures to a case construction project. Students will demonstrate case layout. (NCCER Module 27501)
Prerequisite: None

CABT 1070 Drafting & Construction Drawings 30 Hours
This course is designed to expose students to the fundamentals of drafting. Students will gain an understanding of drafting tools and procedures. Students also learn about drafting careers and industry requirements. Content includes basic knowledge of sketching, drafting, and architectural graphics. This course will utilize industry recognized software to prepare drawings.
Prerequisite: None
CABT 2010 Laminating 30 Hours
This course exposes students to a variety of plastic laminates and the uses of plastic laminates. Students will use laminating techniques to create a project. Students will also be exposed to the variety of patterns and the types of materials used, the type of contact cement used, and how to apply the laminate to the core material. (NCCER Module 27501)
Prerequisite: None

CABT 2020 Cabinet and Furniture Design and Layout 75 Hours
This course covers the proper steps to laying out a cabinet, making a cut sheet, material list, and a strategy focused on material optimization. Students will be exposed to the basic techniques of designing a kitchen from a construction drawing. The course covers different styles of kitchens and students will learn how to draft different types of kitchens. The student will apply fundamentals to design a kitchen of their choosing.
Prerequisite: CABT 1070 Fundamental Drafting

CABT 2030 Cabinet and Furniture Construction 75 Hours
This course will introduce the students to advanced cabinet and furniture building including: designing, drawing and making a rod layout. Students will be required to practice machining lumber to a given specification. The students are given a choice of dowel construction or mortise and tenon construction. Students will check for proper location of rail to stile, the assembly of face frame, correct width and height, as well as inside openings of face-frame. The cabinet and furniture building quality is a strict focus in this course. (NCCER Module 27501)
Prerequisite: CABT 1070 Fundamental Drafting

CABT 3010 Advanced Cabinet & Furniture Construction 45 Hours
This course is designed to provide an overview of production cabinetmaking environments. Students will set-up a cabinetmaking shop utilizing production flow associated with creating cabinets.
Prerequisite: CABT 2030 Cabinet and Furniture Construction

CABT 3020 Cabinet Hardware 30 Hours
This course is designed to expose students to a variety of hardware associated with cabinetmaking. Students will be choosing and installing appropriate hardware for the application. This course specializes in techniques and strategies for utilizing industry standard and specific hardware found in modern and vintage cabinet and furniture construction. (NCCER Module 27501)
Prerequisite: CABT 2030 Cabinet and Furniture Construction

CABT 3030 Advanced Cabinet & Furniture I 75 Hours
This course exposes students to the preparation and completion of cabinet and furniture installation. Students will be setting up and installing shop built cabinets.
Prerequisite: CABT 2030 Cabinet and Furniture Construction

CABT 3040 Advanced Cabinet & Furniture II 75 Hours
This course exposes students to the preparation and completion of cabinet and furniture installation. Students will be setting up and installing shop-built cabinets in a real or simulated setting.
Prerequisite: CABT 3030 Advanced Cabinet & Furniture Construction
CARPENTRY

Locations: FRB, ML

Program Focus:
This program provides hands-on training and the skills needed to succeed in a carpentry career. Students learn to use basic tools such as saws and pneumatic nail guns. Carpenters use these tools to frame floor systems, assemble walls and install doors. Students utilize problem solving techniques and participate in hands-on activities to develop and understand course concepts. National Center for Construction Education and Research (NCCER) modules are embedded throughout the program.

Entrance Requirement:
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

Physical Demands: Must be able to lift 60 pounds

Award Offered:  
Carpentry Certificate 540 Hours

Awarding Establishment:  
Century College

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<th>Required Course Work</th>
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<td>GSHR 1000 Workplace Human Relations</td>
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<tr>
<td>CARP 1010 Carpentry Safety</td>
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<td>CARP 1020 Basic Construction</td>
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<td>CARP 1030 Construction Drawings</td>
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<td>CARP 1040 Design &amp; Estimating</td>
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<td>CARP 1050 Advanced Carpentry Theory I</td>
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<td>CARP 1060 Framing Technology</td>
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Program Courses:

**GSHR 1000 Workplace Human Relations 60 Hours**
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

**CARP 1010 Carpentry Safety 90 Hours**
This course covers general safety both on the project site and in the shop. Students will learn about the importance of following safe workplace practices and procedures, how to inspect safety equipment before use, and how to use safety equipment properly. (NCCER Module 00101, 00103, 00104, 00106, 00109, 27103)
Prerequisite: None

**CARP 1020 Basic Construction 70 Hours**
This course covers carpentry framing principals and techniques. Each student will participate in activities where they will measure, cut and assemble construction materials used for residential building. This unit will focus on foundations, floor, and walls. (NCCER Modules 27101, 27105, 27111, 27109, 27208)
Prerequisite: None

**CARP 1030 Construction Drawings 70 Hours**
This course covers the use of construction drawings used within the construction industry. Students will learn to identify symbols, read basic plans, and comprehend details and diagrams from a variety of construction drawings. (NCCER Modules 00105, 27104)
Prerequisite: None

**CARP 1040 Design & Estimating 70 Hours**
This course covers the principles of design when considering construction projects. Students will investigate the use of sustainable building practices and materials in choosing a specific design. Each student will estimate materials needed to build a structure. (NCCER Modules 27102, 00102)
Prerequisite: None

**CARP 1050 Advanced Carpentry Theory I 90 Hours**
This course covers general practices for enclosing the structure, such as roofing material, door and window installation and exterior siding. Students will complete hands-on activities in each of these areas. Additional learning opportunities may be completed to enhance their skills. (NCCER Modules 27204, 27203, 27202)
Prerequisite: CARP 1010

**CARP 1060 Framing Technology 90 Hours**
This course covers roof and stair framing systems. Content topics include instruction in hand and stick framing techniques. Topics also include sheathing applications and installation. Students will use hand tools to layout and construct roof and stair systems. (NCCER Modules 27112, 27110)
Prerequisite: CARP 1010
COMPUTER CAREERS

Awards Offered:
Introduction to Computer Careers Certificate 440 Hours
Desktop Publishing Certificate 1350 Hours
Microsoft Office Specialist Certificate 640 Hours
A+ Preparation Certificate 1032 Hours
Help Desk Specialist Certificate 684 Hours
Office Support Certificate 15 Credits

Introduction into Computer Careers

Locations: FRB, LL, ML, OPH, STW

Program Focus:
This program offers the opportunity to learn about the computer operating systems, and Microsoft Office software. Students also work on their keyboarding skills, and explore computer concepts. The coursework covers instruction in the Microsoft Suite. The Microsoft Word program allows students to learn how to create flyers, research papers, and letters. In the Microsoft Excel program students create spreadsheets to calculate functions and formulas, create charts, and format numerical information. The Microsoft PowerPoint program allows students to create eye-catching slide shows by incorporating graphics and visual effects, animations, and audio and video files. The Microsoft Access program teaches students how databases organize information, and demonstrates how to extract data for useful reports and queries. Computer Concepts covers a wide range of relevant information including computer hardware, software, file management, networks, the internet, the web, and email. Students also learn electronic security, history and ethics, computer information systems, and programming.

Entrance Requirement:
Reading at 10th grade or higher (TABE 10.0 or higher), and Math at 9th grade or higher (TABE 9.0 or higher)

Awards Offered:
Introduction to Computer Careers Certificate 440 Hours

Awarding Establishment:
Century College

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<tr>
<td>COMP 1010 Skill Building</td>
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<td>COMP 1020 Computer Concepts</td>
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<tr>
<td>COMP 1030 Microsoft Office Applications</td>
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**Program Courses:**

**GSHR 1000 Workplace Human Relations 60 Hours**
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

**COMP 1010 Skill Building 60 Hours**
This course introduces students to the latest Microsoft Windows operating system and alphanumeric keyboarding techniques. Basic concepts such as the desktop, files, windows, directory structures, touch keyboarding styles, and typing within applications will be covered.
Prerequisite: None

**COMP 1020 Computer Concepts 140 Hours**
This course introduces students to personal computers. The beginning concepts of the Windows desktop operating environment are included along with the basics of networking, information systems, and the properties of emerging technology now available. The course will serve as a foundation for all other courses taught in the Computer Careers program.
Prerequisite: None

**COMP 1030 Microsoft Office Applications 180 Hours**
This course introduces students to applications contained within the Microsoft Office Suite, including Excel, Access, PowerPoint, and Word. Basic tasks will be taught and mastered, and students will also be introduced to more complex Microsoft Office functions. Interactivity between applications is covered to teach efficiency and provide the potential of mastery in the separate applications.
Prerequisite: None
Desktop Publishing

Location: STW

Program Focus:
This certificate is designed to provide participants with the skills and knowledge necessary to facilitate design, set up, and publication of layouts for web and print production. Students will receive instruction on graphic manipulation, page layout, animation, basic HTML, and the basic concepts of color theory, text attributes, vector and raster graphics, and standard file setup for both electronic and print production.

Entrance Requirements:
Reading at 10th grade or higher (TABE of 10.0 or higher), and Math at 9th grade or higher (TABE of 9.0 or higher)
Introduction to Computer Careers Certificate

Awards Offered:
Desktop Publishing Certificate 1350 Hours

Awarding Establishment:
Century College

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<td>COMP 2320 Adobe Web Collection</td>
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<td>COMP 2330 Microsoft Publisher</td>
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<td>COMP 2340 HTML Web Development</td>
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Program Courses:
COMP 2310 Adobe Design Collection 378 Hours
In this course, students learn the most important topics of Adobe InDesign, Adobe Illustrator, and Adobe Photoshop. Students learn InDesign, including how to set up documents, work with text, frames, and colors. Students learn Illustrator, including how to create text and gradients, and draw and compose an illustration, transform and distort objects, and how to work with layers. Finally, students learn Photoshop, including how to work with layers, make selections, incorporate color techniques, and place type in an image. Students also learn how to integrate the three programs.
Prerequisite: None

COMP 2320 Adobe Web Collection 378 Hours
This course introduces the student to the basic skills required for developing computer graphics, animations, and web pages using the Adobe suite of products. Three professional design tools will be explored: Dreamweaver, Flash, and Fireworks. After successful completion of this course, the student will have a good working knowledge of web development techniques and a working vocabulary of the terms commonly used for these applications.
Prerequisite: None
COMP 2330 Microsoft Publisher 288 Hours
This course covers fundamental concepts and techniques of desktop publishing working with a variety of documents using Microsoft Publisher. Examples of subjects included in this course are: use of fonts, simple text documents, adding graphics, text flow, use of headers and footers, and creating master pages. More advanced topics include creating and using graphics; sophisticated color tools; creating and managing large documents; and publishing to the Internet.
Prerequisite: None

COMP 2340 HTML Web Development 306 Hours
This course will teach the most important topics of HTML and Cascading Style Sheets (CSS). Students will begin with an introduction to developing a Web page and a Web site, moving on to working with cascading style sheets and much more. Students will learn to create special effects using CSS and work with Web tables and forms. Students will also work with multimedia, designing a Web site using frames, and work with the current version of HTML. Final instruction will cover JavaScript and its role in programming.
Prerequisite: None
Microsoft Office Specialist

Locations: FRB, LL, ML, OPH, STW

Program Focus:
Students will utilize Microsoft approved curriculum to learn the skills required to efficiently and accurately utilize Microsoft Word, Excel, PowerPoint, and Access. This program will prepare students for Microsoft certification exams at the specialist and expert levels. Microsoft Office certification is the industry recognized proof of skill proficiency and software knowledge.

Entrance Requirement:
Reading at 10th grade or higher (TABE 10.0 or higher), and Math at 9th grade or higher (TABE 9.0 or higher)
Introduction to Computer Careers Certificate

Awards Offered:
Microsoft Office Specialist Certificate 640 Hours

Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 2010 Microsoft Word</td>
<td>160</td>
</tr>
<tr>
<td>COMP 2020 Microsoft Excel</td>
<td>175</td>
</tr>
<tr>
<td>COMP 2030 Microsoft Access</td>
<td>175</td>
</tr>
<tr>
<td>COMP 2040 Microsoft PowerPoint</td>
<td>130</td>
</tr>
</tbody>
</table>
Program Courses:

**COMP 2010 Microsoft Word 160 Hours**
This course provides students with advanced skills in the word processing application. Concepts covered include advanced techniques for tables, text styles, mail merge, document formatting, forms, macros, and reference documents. Upon completion, students will create, modify, and exhibit various types of documents created with Microsoft Word. Microsoft MCTS/MCITP Exam.
Prerequisite: None

**COMP 2020 Microsoft Excel 175 Hours**
This course provides students with advanced skills in the spreadsheet application. The course covers: the more complex use of spreadsheets, including financial functions; schedule creation; advanced formatting techniques; the use of Excel as a database; designing templates; creating multiple worksheet workbooks; formula auditing and validation; importing data; and creating PivotTables. Upon completion, students will understand how to utilize Excel’s powerful features for financial reports and data compilation. CompTIA A+ Exam.
Prerequisite: None

**COMP 2030 Microsoft Access 175 Hours**
This course provides students with advanced skills in the database application. The course covers advanced techniques for form and report design, macros and switchboards, PivotTables and PivotCharts, data integration from other Office applications, and database administration concepts and tasks. Upon completion, students will be able to use Access’s powerful features to create, modify, update, and utilize new and existing databases.
Prerequisite: None

**COMP 2040 Microsoft PowerPoint 130 Hours**
This course provides students with advanced skills in the presentation application. The course covers: integration of elements from other Office applications; advanced slide design concepts; integration of visual and audio elements; utilization of tools to assist in preparing and presenting presentations; creating macros; customizing toolbars and menus; and using AutoShapes and animation effects. Upon completion, students will be able to create attractive and informative presentations.
Prerequisite: None
**A+ Preparation**

**Locations:** FRB, STW

**Program Focus:**
In this certificate, students will be introduced to the internal workings of a typical PC and how to troubleshoot/diagnose problems, and access an upgrade. They will also be introduced to basic cabling and network techniques, as well as topics connected to the Windows operating system environment. Students will learn skills related to customizing and configuring their own desktop environment and how to perform common tasks. The direction of this certificate will be driven by the current COMPTIA A+ Hardware and Software Exams, and the current Microsoft MCP certifications.

**Entrance Requirements:**
Reading at 10th grade or higher (TABE 10.0 or higher), and Math at 9th grade or higher (TABE 9.0 or higher)
Introduction to Computer Careers Certificate

**Awards Offered:**

**A+ Preparation Certificate**
1032 Hours

**Awarding Establishment:**
Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
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<tbody>
<tr>
<td>COMP 2210 Windows Operating System Technology</td>
<td>342</td>
</tr>
<tr>
<td>COMP 2220 PC Maintenance</td>
<td>480</td>
</tr>
<tr>
<td>COMP 2230 Introduction to Networking</td>
<td>210</td>
</tr>
</tbody>
</table>
Program Courses:

COMP 2210 Windows Operating Systems Technology 342 Hours
This course introduces students to topics connected to the Windows operating system environment. Students will learn skills related to customizing and configuring their own desktop environment and how to perform common tasks. This course is geared for the student to pass the Microsoft MCTS/MCITP 70-680 Exam. Prerequisite: None

COMP 2220 PC Maintenance 480 Hours
In this course, students are introduced to the internal workings of a typical PC compatible computer and to troubleshooting and upgrading it. Static electricity concerns, diagnostic tools, and removal and replacement procedures will be addressed. Hands-on practice will be extensively applied, using power supplies, mother boards, memory, hard drives, CD-ROMs, Optical Drives, sound cards, modems, and networking equipment. This course is geared for the student to pass the CompTIA A+ 220-90 and 220-91 Exams. Prerequisite: None

COMP 2230 Introduction to Networking 210 Hours
This course is designed to introduce the student to the basics of the cabling for networks. It touches on the common types of cabling including coaxial, twisted pair and fiber optic. It discusses the topologies in which you can incorporate these cabling types. The planning, design, and implementation of a proper network layout are covered in this course. It addresses the documentation part of cabling implementation. This course addresses the different components that are needed to transmit data. Safety and protection against fires is also covered. Prerequisite: None
Help Desk Specialist

Locations: FRB, STW

Program Focus:
This certificate is designed to give students a comprehensive view of the challenges faced by a professional Help Desk support specialist. These challenges include hardware and software troubleshooting techniques, user support skills, application problem diagnosis, and Help Desk operational, staffing and data management concerns.

Entrance Requirements:
Reading at 10th grade or higher (TABE of 10.0 or higher), and Math at 9th grade or higher (TABE of 9.0 or higher)
Introduction to Computer Careers Certificate and MOS Certificate

Awards Offered:
Help Desk Certificate 684 Hours

Awarding Establishment:
Century College

Required Course Work

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tr>
<td>COMP 3010</td>
<td>Introduction to Project Management</td>
<td>156</td>
</tr>
<tr>
<td>COMP 3020</td>
<td>Systems Analysis and Design</td>
<td>264</td>
</tr>
<tr>
<td>COMP 3030</td>
<td>Concepts of Help Desk</td>
<td>264</td>
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</tbody>
</table>

Program Courses:

**COMP 3010 Introduction to Project Management 156 Hours**
This is an introductory course to introduce the student to concepts of Project Management. Project Management is a growing skill in today’s workplace. The student will learn how to break down a project into its working components, goals and business objectives, and carry a project to completion.
Prerequisite: None

**COMP 3020 Systems Analysis and Design 264 Hours**
This course covers the concepts of system analysis and design from the microcomputer end-user standpoint. New system planning, documentation, feasibility, data collection and analysis, system integration, and implementation are covered. Students will be required to design a system solution to a given problem and make a presentation of the system.
Prerequisite: None

**COMP 3030 Concepts of Help Desk 264 Hours**
This course introduces the student to the essential concepts in planning and running an effective help desk. These concepts include the structure of the help desk, support and project management strategies, and help desk tools.
Prerequisite: None
Office Support

Location: SHK

Program Focus:
There is a great demand for office support personnel in manufacturing companies, governmental agencies, clinics, small businesses, corporations and other workplaces. This program teaches basic office support knowledge and skills, including keyboarding, Windows operating system use, Microsoft Office applications, search techniques, managing information, office documentation, and applying basic math principles. Graduates of this program can confidently seek employment in a business office. Transcript from Hennepin Technical College is awarded upon completion.

Entrance Requirements:
Reading at 11th grade or higher (TABE 11.0 or higher), and Math at 10th grade or higher (TABE 10.0 or higher)

Awards Offered:
Office Support Certificate from Hennepin Technical College 15 Credits

Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Credits</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
<td>NA</td>
<td>60</td>
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<tr>
<td>CPLT 1005 Skill Building &amp; Document Processing</td>
<td>3</td>
<td>48</td>
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<tr>
<td>CCIS 1035 Microsoft Word</td>
<td>3</td>
<td>48</td>
</tr>
<tr>
<td>CCIS 1080 Microsoft Office</td>
<td>3</td>
<td>48</td>
</tr>
<tr>
<td>MATH 1060 Math Pathways for College and Careers</td>
<td>3</td>
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</tr>
<tr>
<td>ENGL 1010 Business English</td>
<td>3</td>
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</table>
Program Courses:

GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

CPLT 1005 Skill Building & Document Processing 3 cr, 48 Hours
Students will improve keyboarding technique and skill. This course will emphasize using the touch method to build speed and accuracy and will also cover business reports, interoffice memorandums and business letters with envelopes.
Prerequisite: Qualifying score on keyboarding assessment test OR CPLT 1000

CCIS 1035 Microsoft Word 3 cr, 48 Hours
This course will include creating, editing and formatting of business documents. Students will also receive training in features such as merge, sort, tables and other enhancements.
Prerequisite: CPLT 1005

CCIS 1080 Microsoft Office 3 cr, 48 Hours
This course provides students with training in the Microsoft Office Suite. Students will receive instruction in Word, Excel, Access and PowerPoint.
Prerequisite: CCIS 1035

MATH 1060 Math Pathways for College and Careers 3 cr, 48 Hours
This course is designed for students to establish a foundation for problem solving and critical thinking used in college level mathematics and career applications. Topics include practical applications of real numbers, geometry, measurement, data analysis, and algebraic equations.
Prerequisite: None

ENGL 1010 Business English 3 cr, 48 Hours
The majority of the time in this course will be spent on the spelling, grammar, punctuation, proofreading, and editing skills needed for success in the work world. Students will then apply these skills to produce a few short documents using correct English with appropriate formatting.
Prerequisite: None
COMPUTER NETWORK CABLING C-TECH

Locations: LL, ML

Program Focus:
This program provides all aspects of connectivity methods in today’s world and delivers the foundation for network cabling with up-to-date standards in the area of telecommunications technologies, copper based systems, and fiber optic based systems. The program provides a general introduction and foundation in current network technologies for local-area networks (LANS), wide area networks (WANS), metro area networks (MANS), and internet. C-TECH Programs are designed to certify students for meaningful employment and/or advanced training in the network cabling and telecommunication fields. There is a continuing and expanding need for entry-level technicians to keep systems up and running as the world becomes more interconnected. C-Tech fills the need with educational programs designed for all who work in the field.

Students must complete the training for each course, and pass the three components of the final exam for each course with 85% proficiency to obtain certification of achievement for Introduction to Telecommunications Systems, Introduction to Network Cabling, and Fiber-Optic based systems. The NCS C-TECH certificate is obtained by acquiring all three certificates. Evaluation and final grading is done by C-TECH, Inc.

Entrance Requirement:
Reading and Math at the 10th grade level or higher (TABE 10.0 or higher)

Awards Offered:
Network Cabling Specialist NCS 350 Hours

Awarding Establishment:
C-TECH

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>CNWC 1010 Introduction to Telecommunications Systems</td>
<td>70</td>
</tr>
<tr>
<td>CNWC 1020 Introduction to Network Cabling Systems</td>
<td>75</td>
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<tr>
<td>CNWC 1030 Introduction to Fiber Optics Systems</td>
<td>70</td>
</tr>
<tr>
<td>CNWC 1040 Networking Essentials</td>
<td>75</td>
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</tbody>
</table>
Program Courses:
GSHR 1000 Workplace Human Relations
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

CNWC 1010 Intro to Telecommunications Technology System 70 Hours
This course will help prepare students to enter the world of telecommunications. Students will be introduced to the basic telecommunication systems and the physical layer components that are present in this field. Students will learn the history and function of various systems, and get an introduction to cabling, safety, tools, and troubleshooting as well as Smart Home Technologies. (Modules 1-7)
Prerequisite: None
Certification: Telecommunications Technologies

CNWC 1020 Intro to Network Cabling Systems Copper Based 75 Hours
This course is designed to provide students with the knowledge and skills necessary to become an entry-level technician in the network cabling industry. The focus of this course is to master the basics of copper cabling, installation, construction, and troubleshooting using C-TECH patented workstations. Students experience up-to-date industry standards and real world workplace simulations. (Modules 1-11)
Prerequisite: CNWC 1010
Certification: Network Cabling Specialist Copper Systems

CNWC 1030 Intro to Fiber Optics Systems 70 Hours
This course is designed to provide students with entry-level theoretical and hands-on knowledge of fiber optics. The course focuses on fiber theory, tool use, construction techniques, understanding the application, use and characteristics of various fiber optic components, troubleshooting, and repair. (C-TECH Modules 1-11)
Prerequisite: CNWC 1020
Certification: Network Cabling Specialist Fiber Optic Systems

CNWC 1040 Networking Essentials 75 Hours
This course serves as a general introduction for students to acquire a foundation in current network technologies Operating Systems, types of Network Topologies (LAN, MAN, WAN) design, protocols and types of connections used in a network. It also covers the basic functions of network administration and operation. This course helps prepare students for certification testing. (Chapters 1-13)
Prerequisite: CNWC 1030
COSMETOLOGY

Location: SHK

Program Focus:
This 1610 hour course will provide many career opportunities for cosmetology program graduates in the salon and spa industries, fashion industries, and salon product companies. This program provides instruction for students to develop the fundamental knowledge of cosmetology practical applications and the communication skills required for a successful career in cosmetology or a related career field. The program uses a state-approved curriculum to ensure the content will prepare students to meet industry-level standards to obtain an entry-level position as a licensed cosmetologist. Inspected and approved by the MN Cosmetology Board, successful completers sit for the Cosmetology exam prior to release; instructor is a licensed Cosmetologist.

Entrance Requirements:
Reading at 11th grade or higher (TABE 11.0 or higher), and Math at 9th grade level or higher (TABE 9.0 or higher)

Awards Offered:
Cosmetology (Certificate)  1610 Hours
4 hour Core (Certificate)  4 Hours
4 hour Professional Practice (Certificate)  4 Hours

Awarding Establishment: MN Cosmetology Board

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
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<tr>
<td>COSM 1010 Pre-Clinic Introduction</td>
<td>75</td>
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<tr>
<td>COSM 1015 Pre-Clinic Hair Care</td>
<td>75</td>
</tr>
<tr>
<td>COSM 1020 Pre-Clinic Nail Care</td>
<td>75</td>
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<tr>
<td>COSM 1025 Pre-Clinic Chemical Control</td>
<td>75</td>
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<tr>
<td>COSM 1030 Pre-Clinic Skin</td>
<td>75</td>
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<tr>
<td>COSM 1035 Pre-Clinic Hair Color</td>
<td>75</td>
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<tr>
<td>COSM 1040 Advanced Hair Care</td>
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<tr>
<td>COSM 1045 Salon Preparation</td>
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<tr>
<td>COSM 1050 Clinic I</td>
<td>90</td>
</tr>
<tr>
<td>COSM 1055 Clinic II</td>
<td>90</td>
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<tr>
<td>COSM 1060 Clinic III</td>
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<td>COSM 1065 Clinic IV</td>
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<td>COSM 1070 Clinic V</td>
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<td>COSM 1075 Clinic VI</td>
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<tr>
<td>COSM 1080 Clinic VII</td>
<td>90</td>
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<tr>
<td>COSM 1085 Clinic VIII</td>
<td>90</td>
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<tr>
<td>COSM 1090 License Preparation I</td>
<td>90</td>
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<tr>
<td>COSM 1095 Salon Operations I</td>
<td>70</td>
</tr>
<tr>
<td>COSM 1100 Salon Operations II</td>
<td>70</td>
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<tr>
<td>Lic renewal 4 Hour Core Course</td>
<td>4</td>
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<tr>
<td>Lic renewal 4 Hour Professional Practice</td>
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Program Courses:
GSHR 1000 Workplace Human Relations
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisites: None

COSM 1010 Pre-Clinic Introduction 75 Hours
This course provides an introduction to cosmetology, including effective communication skills, professional image, rules and responsibilities, safety procedures, and Minnesota Cosmetology Laws and Rules. Students are provided with identification of tools and use.
Prerequisites: None

COSM 1015 Pre-Clinic Hair Care 75 Hours
This course covers in-depth level sanitation, anatomy and physiology, trichology, infection control including bacteria, viruses and parasites. Students are provided with elementary hair service skills including shampooing, cutting and styling.
Prerequisites: COSM 1010

COSM 1020 Pre-Clinic Nail Care 75 Hours
This course provides an introduction to nail care and disease and disorders. Students are provided with elementary skills in manicuring, pedicuring, and artificial nails.
Prerequisites: COSM 1010 – COSM 1015

COSM 1025 Pre-Clinic Chemical Control 75 Hours
This course involves an in-depth look at safety and sanitation in the salon including safety data sheets, personal protective equipment, and biohazard procedures. Students are provided with an introduction to chemicals and their applications. The area of study includes curl reformation: permanent waving, soft curl perming, and chemical hair relaxing.
Prerequisites: COSM 1010 – COSM 1020

COSM 1030 Pre-Clinic Skin 75 Hours
This course examines the basics of dermatology and skin care including skin analysis, massage, makeup applications, and waxing in multiply areas of the body.
Prerequisites: COSM 1010 – COSM 1025

COSM 1035 Pre-Clinic Hair Color 75 Hours
This course provides an introduction to the four types of hair coloring and decolorization. Student will learn effective consultation steps as well as industry standard application guidelines.
Prerequisites: COSM 1010 – COSM 1030

COSM 1040 Advanced Hair Care 75 Hours
This course provides advance training in the skills including advanced haircuts, marcel curling irons, applications of hair coloring, chemical reformation, hair shaping and styling. The course also provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, manicuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1035

COSM 1045 Salon Preparation 75 Hours
This course provides student with the opportunity to develop salon communication skills with clients. Greeting, consultation and sales will be a focus in this course. Students will also be performing practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, manicuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1050 Clinic I 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, manicuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040
COSM 1055 Clinic II 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1060 Clinic III 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1065 Clinic IV 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1070 Clinic V 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1075 Clinic VI 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1080 Clinic VII 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1085 Clinic VIII 90 Hours
This course provides students with the opportunity to develop practical skills in hair shaping, hairstyling, hair coloring, shampooing, chemical control, skin care including facial and make-up applications, mancuring, pedicuring, and artificial nail applications, with an emphasis on safety and sanitation.
Prerequisites: COSM 1010 – COSM 1040

COSM 1090 License Preparation I 90 Hours
This portion of the cosmetology program will prepare students for the MN Cosmetology State General Exam, Practical Written Exam and MN Statutes and Rules Exam. This course will also prepare students for the required skills readiness exams and for working in the salon.
Prerequisites: COSM 1010 – COSM 1085

COSM 1095 Salon Operations I 70 Hours
This portion of the cosmetology course gives the students’ time to complete required services and/or hours for licensure. Salon types of operations and salon management and communication will be covered in the course.
Prerequisites: COSM 1010 – COSM 1090

COSM 1100 Salon Operations II 70 Hours
This portion of the cosmetology course gives the students’ time to complete required services and/or hours for licensure. Salon types of operations and salon management and communication will be covered in the course.
Prerequisites: COSM 1010 – COSM 1095
4 Hour Core Course 4 Hours
This course will give the students an understanding of Minnesota Laws and Rules governing cosmetology. They will be able to recognize health factors relevant to applications and services performed on the public and understand the proper disinfection procedures governing cosmetology. They will have a working knowledge of OSHA safety and sanitation procedures including the use of universal precautions.

4 Hour Professional Practice 4 Hours
In this hands-on course, students will practice chemistry and chemical interactions in hair coloring, permanent waving, hair relaxing, and acrylic nail application. Students will review the factors of hair analysis, and the physical and chemical actions that take place during hair coloring, hair relaxing, permanent waves, and acrylic nail services. Students will perform applications of hair color, relaxer, and acrylic nails, and review safety procedures to ensure safe application of chemicals on clients.
DRYWALL

Location: FRB

Program Focus:
This 480 hour program introduces students to the knowledge base and technical skills of the drywall industry. The curriculum begins with National Center for Construction Education and Research (NCCER) Core Curriculum, which is a prerequisite to all Level 1 completions. The students will complete modules in Basic Safety, Introduction to Construction Math, Introduction to Hand Tools, Introduction to Power Tools, Introduction to Construction Drawings, and Introduction to Material Handling. Students will then begin developing skills related to the fundamentals of drywall such as Orientation to the Trade; Building Materials, Fasteners, and Adhesives; and Hand and Power Tools. Students utilize problem solving techniques and participate in hands-on activities to develop an understanding of course concepts.

Entrance Requirements:
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

Physical Demands: Must be able to lift 40 pounds

Awards Offered:
Drywall Installation Certificate  480 Hours

Awarding Establishment: Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GSHR 1000  Workplace Human Relations</td>
<td>60</td>
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<tr>
<td>DRW 1130  Introduction to Commercial Interiors</td>
<td>90</td>
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<tr>
<td>DRW 1140  Construction Drawings and Estimating</td>
<td>40</td>
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<td>DRW 1150  Drywall Systems</td>
<td>80</td>
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<tr>
<td>DRW 1160  Commercial Wall Systems</td>
<td>80</td>
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<tr>
<td>DRW 1170  Advanced Finishing</td>
<td>80</td>
</tr>
<tr>
<td>DRW 1180  Introduction to Painting</td>
<td>50</td>
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</tbody>
</table>
Program Courses:

GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

DRW 1130 Introduction to Commercial Interiors 90 Hours
This course covers general safety both on the project site and in the shop. Students will learn about the importance of following safe workplace practices and procedures, how to inspect safety equipment before use, and how to use safety equipment properly. Course content also includes professional workplace behavior and appearance. (NCCER Modules 00101, 00103, 00104)
Prerequisite: None

DRW 1140 Construction Drawing and Estimating 40 Hours
This course is an introduction to construction drawings and their primary uses when estimating construction materials. Students will be exposed to content that uses mathematics to estimate materials. Construction drawing topics include the identification of symbols, reading, basic plans, details, and diagrams from a variety of trade areas. (NCCER Modules 00102, 00105)
Prerequisite: None

DRW 1150 Drywall Systems 80 Hours
The course will consist of theory and laboratory experiences. Students will be able to apply classroom theory to lab project. The main focus is to develop basic knowledge and skills for hanging, taping, and finishing interior drywall surfaces. (NCCER Modules 27206, 27207)
Prerequisite: None

DRW 1160 Commercial Wall Systems 80 Hours
This course is designed to provide the student the hands-on experience of metal stud layout and framing techniques. Drywall applications used in DRW 1150 Drywall Systems will be expanded and skills enhanced in this course. Suspended ceiling layout and construction is also included in this course. (NCCER Modules 27111, 27205, 27208)
Prerequisite: DRW 1150

DRW 1170 Advanced Finishing 80 Hours
This course is designed to expand the knowledge and skills acquired in both DRW 1150 and 1160. Students will use complex automatic taping tools and apply theory of advanced taping techniques to laboratory and/or site projects. There is a strict focus on care and repair of complex tools used in the industry. (NCCER Modules 27206, 27250)
Prerequisite: DRW 1150 and DRW 1160

DRW 1180 Introduction to Painting 50 Hours
This course will provide the student with an overview of the painting and decorating industry and introduce the student to the tools of the trade, basic surface preparation methods and the application of coatings.
Prerequisite: DRW 1170
ENGINEERING DRAFTING AND DESIGN

Location: FRB

Program Focus:
This program can be taken in two parts starting with the 510 hour Computer Aided Drafting (CAD) Operator certificate, and advancing towards a 780 hour Engineering Drafting and Design Diploma. In today’s engineering world, 3-Dimensional (3D) models are required. This program prepares students to effectively create 3D models and their associated engineering drawings that meet industry standards. Successful graduates will possess the skills, knowledge, and ability to gain an entry-level position utilizing CAD tools and techniques. Nearly every object fabricated needs a set of plans to reliably and repeatedly be created, from an entire assembled product to its individual components to the tooling needed to make the components. Operators will be able to translate rough sketches, layouts, and written specifications of the engineer, or more senior designer, into a drawing showing complete details and specifications. Ensuring that these components will function properly is an important aspect of engineering that the student will learn in the diploma program. The student will learn the necessary skills to apply advanced dimensioning techniques to ensure proper fit and function as well as calculate the strength of a component based on its design and material. The student who earns their diploma in this course will have the skills to start as an entry-level drafter or designer.

Entrance Requirement:
Reading and Math at 10th grade level or higher (TABE 10.0 or higher)

Physical Demands: Must be able to sit for extended periods of time. Mechanical aptitude, spatial, and basic computer skills are beneficial.

Awards Offered:

<table>
<thead>
<tr>
<th>CAD Operator Certificate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSBR 1000 Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>EDDT 1010 Engineering Graphics I</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1020 Basic SolidWorks</td>
<td>120</td>
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<tr>
<td>EDDT 1030 Engineering Graphics II</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1040 Technical Math I</td>
<td>90</td>
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</table>

<table>
<thead>
<tr>
<th>Engineering Drafting and Design Diploma</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDDT 1110 Advanced SolidWorks</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1120 Geometric Dimensioning and Tolerancing</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1130 Manufacturing Processes</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1140 Technical Math II</td>
<td>60</td>
</tr>
<tr>
<td>EDDT 1210 Introduction to Transmission of Power</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1230 Technical Illustration</td>
<td>120</td>
</tr>
<tr>
<td>EDDT 1240 Tool and Die Design</td>
<td>120</td>
</tr>
</tbody>
</table>

Awarding Establishment: Century College
Program Courses:

**GSHR 1000 Workplace Human Relations**
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

**EDDT 1010 Engineering Graphics I**
120 Hours
This course provides an introduction to mechanical drafting. The primary areas of study will be drafting standards, use of equipment, CAD software basic sketching, geometric construction, orthographic projection, special views, and an introduction to dimensioning.
Prerequisite: None

**EDDT 1020 Basic SolidWorks**
120 Hours
This course covers basic SolidWorks use. Students will learn the basics of parametric modeling while creating parts, assemblies, and drawings. The course is designed to provide the skills required to pass the Certified SolidWorks Associate (CSWA) exam.
Prerequisite: None

**EDDT 1030 Engineering Graphics II**
120 Hours
This course expands on the concepts learned in Engineering Graphics I. Dimensioning, tolerancing, fasteners and springs, and an introduction to geometric dimensioning and tolerancing are covered. Current American Society of Mechanical Engineers dimensioning standards (ASME Y14.5) are presented and practiced.
Prerequisite: EDDT 1010

**EDDT 1040 Technical Math I**
90 Hours
This course covers the basics of technical math. From basic arithmetic, ratios, proportions, and linear measurements to fundamentals of algebra and plane geometry. Real world applications will reinforce the concepts learned.
Prerequisite: None

**EDDT 1110 Advanced SolidWorks**
120 Hours
This course delves deeper into SolidWorks’ many tools. Advanced modeling techniques, sheet metal methods and tools, weldment tools, top-down assembly creation, and external references are all covered in depth.
Prerequisite: EDDT 1020 Basic SolidWorks

**EDDT 1120 Geometric Dimensioning and Tolerancing**
120 Hours
This course covers the use of geometric tolerancing per the latest ANSI/ASME Y14.5 standard on Dimensioning and Tolerancing. The student will study and practice the application of advanced dimensioning techniques using the 24 concepts associated with this dimensioning standard.
Prerequisite: CAD Operator Certificate

**EDDT 1130 Manufacturing Processes**
120 Hours
This course covers areas crucial to developing a well-rounded knowledge of engineering drafting and design. The student will study fundamentals of metallurgy, manufacturing processes, engineering change orders and bills of material, welding, and an introduction to statics and strength of materials.
Prerequisite: EDDT 1120 Geometric Dimensioning and Tolerancing

**EDDT 1140 Technical Math II**
60 Hours
This course covers more advanced technical math. Topics covered are areas and volumes of geometric figures, trigonometry, compound angles, and Computer Numeric Control systems. Real world applications will reinforce the concepts learned.
Prerequisite: EDDT 1010 Technical Math I

**EDDT 1210 Introduction to Transmission of Power**
120 Hours
This course covers general practices for modeling linkages, cams, gears, and bearings, and belt and chain drives. Applications of these components will be researched and applied utilizing our 3D printing lab. Fluid power and electronics drafting are introduced as well.
Prerequisite: EDDT 1120 Geometric Dimensioning and Tolerancing
EDDT 1230 Technical Illustration 120 Hours
This course will cover the basic techniques of 3D drawing on oblique, isometric, diametric, and trimetric axis. One point and two point perspectives will also be drawn. The student will complete assembled, exploded, and section drawings while creating technical documentation.
Prerequisite: EDDT 1120 Geometric Dimensioning and Tolerancing

EDDT 1240 Tool and Die Design 120 Hours
This is a capstone course. The knowledge of all previous studies is called upon for the successful completion of a die design. All components, purchased and designed, make up the complete set of die drawings. The student will design all components of a die set. Studies will also include vendor selection, purchased part drawings, reworked purchase part drawings, and assembly drawings. Die design will be the main focus as the student will design all components required for a progressive piercing die.
Prerequisite: EDDT 1120 Geometric Dimensioning and Tolerancing
FLOOR COVERING

Location: FRB

Program Focus:
This 450 hour program provides instruction in five basic types of floor installation: vinyl, laminate, ceramic tile, carpet and hard wood flooring. The program offers the opportunity to learn the basics of floor covering installation along with hands-on in a variety of areas. For the more aggressive student, there is enough content knowledge and experience to successfully install a range of products. Basic layouts and advanced techniques will be available for advanced students. Heavy emphasis is placed on quality workmanship.

Entrance Requirement:
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

Awards Offered:
Floor Covering Certificate 450 hours

Awarding Establishment: Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
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</tr>
<tr>
<td>FLVC 1010 Introduction to Floor Covering</td>
<td>30</td>
</tr>
<tr>
<td>FLVC 1020 Basic Laminate Installation</td>
<td>30</td>
</tr>
<tr>
<td>FLVC 1030 Basic Ceramic Installation</td>
<td>60</td>
</tr>
<tr>
<td>FLVC 1040 Basic Hardwood Installation</td>
<td>30</td>
</tr>
<tr>
<td>FLVC 1050 Resilient Vinyl Installation I</td>
<td>60</td>
</tr>
<tr>
<td>FLVC 1060 Resilient Vinyl Installation II</td>
<td>60</td>
</tr>
<tr>
<td>FLVC 1070 Carpet Installation I</td>
<td>60</td>
</tr>
<tr>
<td>FLVC 1080 Carpet Installation II</td>
<td>60</td>
</tr>
</tbody>
</table>

Program Courses:

GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

FLVC 1010 Introduction to Floor Covering 30 Hours
This introduction course covers general safety both on the project site and in the shop. Students will learn the importance of following safe workplace practices and procedures, how to inspect safety equipment before use, how to use safety equipment properly and the safe use of power tools. All power tools associated with the installation of floor coverings and related work are covered in detail in this course.
Prerequisite: None
FLVC 1020 Basic Laminate Installation
30 Hours
This course covers the history of laminate flooring, its uses, underlayments, trim products and product construction. The students will learn basic and intermediate laminate flooring installation techniques. Topics include: layouts, estimating materials, material acclimation, subfloor requirements and installation of the smallest areas to large areas, stairs and repairs. Emphasis will be placed on professionalism, product identification and quality work using the current industry standard installation tools and equipment.
Prerequisite: None

FLVC 1030 Basic Ceramic Installation 60 Hours
This course is designed to cover basic and intermediate ceramic tile installation techniques, substrate requirements, codes, framing construction, materials and their limitations. Topics include: complete installations from material estimating and layouts, mortar mixing and spreading, installation of tile on floors and walls and grouting. Installation techniques include straight, diagonal, bordering, patterns and inlaid patterns in residential and commercial settings. Emphasis is placed on professionalism, product identification and quality work using the latest of installation tools and equipment.
Prerequisite: None

FLVC 1040 Basic Hardwood Installation
30 Hours
This course covers the history and physical properties of the different types of hardwoods. Content includes: material estimating and limitations, material acclimation, site conditions, tools and installation, refinishing and trim options are all covered. The student will learn basic and intermediate hardwood flooring installation techniques covering substrates, engineered (free floating floors, snap together/interlocking) and nail down floors and identifying the various types of wood flooring and their applications.
Prerequisite: None

FLVC 1050 Resilient Vinyl Installation I
60 Hours
This course content examines general practices for product construction. Content includes: measuring and estimating, underlayment/substrate requirements, vinyl tile installation, including above, on and below grade applications. Students will participate in vinyl tile installation projects including: underlayment and floor preparation, 90 degree, diagonal and bordering, applying various types of wood trim and vinyl base, repairs and refinishing. Emphasis will be placed on professionalism, product identification and quality work.
Prerequisite: None

FLVC 1060 Resilient Vinyl Installation II
60 Hours
This course expounds on topics from FLVC 1050. Students will be exposed to general product construction. Advanced content includes: general practices for product estimating and layout, substrate requirements, vinyl sheet flooring installations (pattern scribing, direct scribing and hand knifing), patterns and matching, seaming and repairs.
Prerequisite: FLVC 1050

FLVC 1070 Carpet Installation I
60 Hours
This course content examines general practices for product construction. Content includes: measuring and estimating, floor preparation and installation of carpet. Students will participate in tack strip and pad installation, seam cutting methods and hot melt seaming of cut pile carpets, carpet stretching and direct glue down installation methods.
Prerequisites: None

FLVC 1080 Carpet Installation II
60 Hours
This course covers more advanced installation procedures for carpet installation, including Berber seaming and installation, patching, pattern matching, bordering and installation of carpet on stairs using the waterfall and cap and band methods.
Prerequisites: FLVC 1070

HEAVY EQUIPMENT OPERATOR
Locations: FRB, RC

Program Focus:
This 420 hour program introduces students to the knowledge base and technical skills of the Heavy Equipment Operator industry. The curriculum begins with National Center for Construction Education and Research (NCCER) Core Curriculum, which is a prerequisite to all Level 1 completions. The students will complete modules in Basic Safety, Introduction to Construction Math, Introduction to Hand Tools, Introduction to Power Tools, Introduction to Construction Drawings, Basic Rigging and Introduction to Material Handling. Students will then begin developing skills related to the fundamentals of Heavy Equipment Operations Level 1 and Level 2, such as Orientation to the Trade, Heavy Equipment Safety, Identification of Heavy Equipment, Basic Operation Techniques, Introduction to Earth Moving, Reading and Interpreting Grades, Excavation Math, Site Work, as well as Inspection, start up, shutdown, operator maintenance of many of the machines used in excavation work. Students utilize problem solving techniques and participate in hands-on and simulated activities to develop and understanding course concepts. Training includes the use of machine simulators.

Entrance Requirement:
Reading and Math at 10th grade level or higher (TABE 10.0 or higher)

Physical Demands: Must be able to sit for extended periods of time, and physically be able to climb a ladder.

Awards Offered:
Heavy Equipment Operator Certificate 420 Hours

Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>HEO 1010 Introduction to Craft Skills</td>
<td>90</td>
</tr>
<tr>
<td>HEO 1020 Heavy Equipment Operations Level 1</td>
<td>90</td>
</tr>
<tr>
<td>HEO 1030 Heavy Equipment Operations Level 2</td>
<td>100</td>
</tr>
<tr>
<td>HEO 1040 Heavy Equipment Operations Lab</td>
<td>80</td>
</tr>
</tbody>
</table>
Program Courses:

GSHR 1000 Workplace Human Relations  
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.  
Prerequisites: None

EDHVYOP 1010 Introduction to Craft Skills  
90 Hours
This course covers the elements of construction safety needed for heavy equipment technicians and operators. Students will learn proper personal protection equipment and the dangers on and off equipment. This course will also give beginning students the basics of how to identify and use hand tools, fasteners, measuring tools, and construction drawings. Students will learn general shop practices and identification and use of power tools.  
Prerequisites: None

EDHVYOP 1020 Heavy Equipment Operations Level 1  
90 Hours
This course gives the students a brief introduction to various equipment types, their components and controls, pre-start inspections, basic equipment operation, and equipment shutdowns. This course covers basic mechanical theories (e.g., how engines work, major external component identification, fuel, lubrication, intake, cooling systems, power trains, basic hydraulic system and drive train fundamentals). Service and maintenance manuals are used as reference resources. The focus is on machine controls, component identification, basic operating technique and safety. This course covers machine types and pre-trip maintenance. This course also covers common operator mistakes and safe starting and stopping procedures. Lecture, visual aids and hands-on using the CAT simulators are used in order to instruct students.  
Prerequisites: None

EDHVYOP 1030 Heavy Equipment Operations Level 2  
100 Hours
This course covers common soils used in the construction industry including soil makeup and characteristics, how soil is compacted, and types of equipment and methods used. Students learn construction math that is applicable to the excavation and grading industry using earthwork volumes, slopes, conversions and geometric calculations. This course covers the basic construction and operation of bucket type equipment. Various operating methods, techniques and procedures will be covered. Students will further their skills on bucket type equipment simulators and go into more detail on techniques used on the job.  
Prerequisites: EDHVYOP 1020 Heavy Equipment Operations Level 1

EDHVYOP 1040 Heavy Equipment Operations Lab (Simulators)  
80 Hours
This course utilizes 4 CAT simulators (Medium Off Road Truck, Large Wheeled Loader, Track Type Tractor and Heavy Excavator) to familiarize and introduce students to Heavy Equipment Operations. Focus will be on pre-start inspection, walk around inspection, control familiarization, and many other common operations. The safe operation of heavy equipment requires proper training to develop safety awareness, good motor skills and an understanding of basic applications. Virtual interactive environments combined with working machine controls provide an opportunity to gain familiarization of controls and learn basic machine operations and functions.  
Prerequisites: None
MACHINE TECHNOLOGY

Location: STW

Program Focus:
This program focuses on basic fundamentals of Basic Metal Forming and Fabrication. Skill areas include the use of hand and power tools, and machinery. Students that complete the certificate, and demonstrate aptitude will advance into the Machine Technology 1 certificate program, where they will learn advanced Metal Forming, and Basic Machining. With completion of the second program, students will advance to the Machine Technology 2 certificate program. The programs are designed to provide students with the skills learned to go into the fabrication/machining field with a general knowledge of the industry.

Entrance Requirement:
Reading and Math at 11th grade level or higher (TABE 11.0 or higher)

Physical Demands: Must be able to lift 50 pounds.

Awards Offered:

<table>
<thead>
<tr>
<th>Certificate</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Basic Metal Forming Certificate</td>
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<tr>
<td>Machine Technology 1 Certificate</td>
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<tr>
<td>Machine Technology 2 Certificate</td>
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Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Basic Metal Forming Certificate</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>MACH 1010 Blueprint Reading I</td>
<td>60</td>
</tr>
<tr>
<td>MACH 1020 Hand Tools, Measurement and Layout</td>
<td>60</td>
</tr>
<tr>
<td>MACH 1030 Hand and Power Machinery</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1040 Shear Operation</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1050 Hand and Hydraulic Break Press Operation</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1060 Hand and Power Rollers</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1070 Hand and CNC Tube Bending Operation</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1080 Hand and CNC Plasma Operation</td>
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</table>

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<thead>
<tr>
<th>Machine Technology I Certificate</th>
<th>Hour</th>
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<tbody>
<tr>
<td>MACH 1 1010 Precision Measuring Tools</td>
<td>75</td>
</tr>
<tr>
<td>MACH 1 1020 Identify and Use of Machine Tools</td>
<td>60</td>
</tr>
<tr>
<td>MACH 1 1030 Lathes I</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1 1040 Vertical Mills I</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1 1050 Solid Works I</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1 1060 Introduction to Surf Cam</td>
<td>90</td>
</tr>
<tr>
<td>MACH 1 1070 Surface Grinding I</td>
<td>75</td>
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<tr>
<td>MACH 1 1080 Introduction To CNC Machines</td>
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Machine Technology II Certificate

<table>
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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MACH 2 1010</td>
<td>Blueprint Reading II</td>
<td>60</td>
</tr>
<tr>
<td>MACH 2 1020</td>
<td>Lathes II</td>
<td>90</td>
</tr>
<tr>
<td>MACH 2 1030</td>
<td>Vertical Mills II</td>
<td>90</td>
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<tr>
<td>MACH 2 1040</td>
<td>Surface Grinding II</td>
<td>60</td>
</tr>
<tr>
<td>MACH 2 1050</td>
<td>Heat Treating and Metallurgy</td>
<td>60</td>
</tr>
<tr>
<td>MACH 2 1060</td>
<td>Solid Works II</td>
<td>60</td>
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<tr>
<td>MACH 2 1070</td>
<td>Advanced Surf Cam</td>
<td>60</td>
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<tr>
<td>MACH 2 1080</td>
<td>CNC Lathes II</td>
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<tr>
<td>MACH 2 1090</td>
<td>CNC Mills II</td>
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</table>

Program Courses:

GSHR 1000 Workplace Human Relations
60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisites: None

MACH 1010 Blueprint Reading I
60 Hours
This course is designed for people who are currently working on, or training to be employed in technical positions that require the use of engineering drawings. Dimensions and notes, multi-view drawings, tolerancing, and shop sketching will be given consideration. This course will focus on the latest drafting conventions including ANSI standards. Students will use textbooks and handouts that guide them through how blueprints are developed and how to interpret them.
Prerequisite: None

MACH 1020 Hand Tools, Measurement and Layout
60 Hours
This course is designed to prepare student for safe operation of hand and measurement tools used in the metal forming / fabrication industry. Students will be introduced to shop safety, identification, use and care of hand and measurement tools.
Prerequisite: None

MACH 1030 Hand and Power Machinery
90 Hours
This course will introduce the student to the hand and power machinery such as (horizontal saw, the vertical band saw, iron worker, grinders, and drill press). Hands on use of these machines and tools will be emphasized through a lab experience.
Prerequisite: None

MACH 1040 Shear Operation
90 Hours
This course will show the students in the mechanics of shearing, burr formation, blanking operations, fine blanking and stamping operations. Students will demonstrate the appropriate safety, set-up and operation along with the care of the machine.
Prerequisite: None
MACH 1050 Hand and Hydraulic Break Press Operation 90 Hours
This course is designed to prepare students for safe operation of machines used in the industry. Students will demonstrate the appropriate set-up and operation along with the knowledge of bending, stretching and drawing of metals. Prerequisite: None

MACH 1060 Hand and Power Rollers 90 Hours
This course exposes students in the basics of roll forming. Students will use shop drawings and apply the appropriate procedures to the use of the rollers. Prerequisite: None

MACH 1070 Hand and CNC Tube Bending Operation 90 Hours
This course is designed to expose students to the use of tube benders. Students will demonstrate the proper setup and operation procedures. Prerequisite: None

MACH 1080 Hand and CNC Plasma Operation 90 Hours
This course teaches students to the safety and use of the plasma cutting and welding. Students will learn the setup, and programing of a CNC plasma cutting system. Prerequisite: None

MACH 1 1010 Precision Measuring Tools 75 Hours
This course will introduce the student to the maintenance and operation of advanced measurement equipment such as height gauges, and gauge pins and blocks. Students will examine setups and fixtures. Advanced measuring techniques will be introduced. Prerequisite: Basic Metal Forming

MACH 1 1020 Identify and Use of Machine Tools 60 Hours
This course will give the student an overview of machining technology as it is used in the manufacturing industry today. The course also covers shop safety, use of hand tools, use of precision measuring tools and the operation of the pedestal grinder. This course will cover the characteristics of hazardous wastes and its safe handling, storage, and disposal. Prerequisite: Basic Metal Forming

MACH 1 1030 Lathes I 90 Hours
This course is designed to introduce the student to the function and application of the engine lathe. Basic turning operations will be performed. Threading with taps and dies, boring and grooving operations will also be covered. Students will produce parts in the shop environment. This course will cover the characteristics of hazardous wastes and its safe handling, storage, and disposal. Prerequisite: Basic Metal Forming

MACH 1 1040 Vertical Mills I 90 Hours
This course will introduce the student to the operation of the vertical milling machine. Emphasis will be placed on machine setup and machining parts square and parallel. Drilling, reaming, tapping, boring and angle milling will also be covered. Students will produce parts in the shop environment. Prerequisite: Basic Metal Forming

MACH 1 1050 Solid Works I 90 Hours
This course is designed to give students hands-on experience using SolidWorks three-dimensional Parametric CAD software. SolidWorks is a mechanical design software that takes advantage of the familiar Microsoft Windows graphical user interface. The students will use the software to create three-dimensional solid parts and assemblies. The students will also create orthographic projections from the solid geometry. Rapid prototyping may be presented in this course. Prerequisite: Basic Metal Forming

MACH 1 1060 Introduction to Surf Cam 90 Hours
This course will introduce the student to computer-assisted design, computer-assisted machining and tool setup. Students will learn machining processes, post-processor selection and set-up will also be covered. Prerequisite: Basic Metal Forming
MACH 1 1070 Surface Grinding I  75 Hours
This course is designed to introduce the student to the surface grinder. Grinding flat surfaces, angles and form grinding will be covered. Students will produce parts in the shop environment.
Prerequisite: Basic Metal Forming

MACH 1 1080 Introduction to CNC Machines  90 Hours
This course will introduce the students to the fundamentals of computer numerical control (CNC) milling and turning. Basic CNC operation and conversational programming will be covered.
Prerequisite: Basic Metal Forming

MACH 2 1010 Blueprint Reading II  60 Hours
This course is a continuation of Blueprint Reading I. Enhancing machinists’ and inspectors’ blueprint reading skills will be emphasized. An introduction to Geometric Dimensioning and Tolerancing will be covered along with other advanced blueprint reading skills.
Prerequisite: MACH 1

MACH 2 1020 Lathes II  90 Hours
This course is a continuation of Turning Technology I covering the operations of single point thread cutting, knurling, form tools and cutting tapers. Special emphasis will be placed on turning with carbide insert tooling. Students will produce parts in the shop environment.
Prerequisite: MACH 1

MACH 2 1030 Vertical Mills II  90 Hours
This course is a continuation of Milling Technology I and will cover the following vertical milling operations: pocket milling, form cutters, milling keyways, using an indexing head and rotary table. Students will produce parts in the shop environment.
Prerequisite: MACH 1

MACH 2 1040 Surface Grinding II  60 Hours
This course is a continuation of Surface Grinding I and will be able to improve their grinding quality, time saving, and reduction in consumables.
Prerequisite: MACH 1

MACH 2 1050 Heat Treating and Metallurgy  60 Hours
This course will introduce the student to the identification and characteristics of the common metals used in the machining industry. Emphasis will be placed on the composition of steel and the effects of its alloys. Heat treating and hardness testing of steel will also be done in lab. This course will cover the characteristics of hazardous wastes and its safe handling, storage, and disposal.
Prerequisite: Basic Metal Forming

MACH 2 1060 Solid Works II  60 Hours
This course is designed to give additional hands-on experience using SolidWorks three-dimensional Parametric CAD software. The students will use the software to create advanced features such as multibody solids, sweeps, lofts, and fillets. Additionally, the students will model sheet metal parts, convert solid parts into sheet metal parts, and model sheet metal in context of an assembly, and produce parts using a 3D printer.
Prerequisite: MACH 1

MACH 2 1070 Advanced Surf Cam  60 Hours
This course will give the student additional hands on to computer-assisted design and computer-assisted machining. Students will use the latest version of Surf Cam software to simulate CNC milling and generate CNC code. Part design, machining processes, and post-processor selection will be covered, and manufacturing parts on a 3D printer.
Prerequisite: MACH 1

MACH 2 1080 CNC Lathes II  60 Hours
This course is designed to allow the student to increase his/her skill level in CNC Turning Centers. Skills learned in the CNC Turning Centers course will be applied to programming and machining selected turned parts.
Prerequisite: MACH 1

MACH 2 1090 CNC Mills II  90 Hours
This course will allow the student to increase their skills in CNC milling applications. CNC machining centers will be utilized. Programming, tooling requirements, machine setup, and machine operation of CNC machining centers will be emphasized.
Prerequisite: MACH 1
MANUFACTURING SKILLS

Locations: FRB, Goodhue County HOF, Steele County HOF

Program Focus:
The Manufacturing Skills program will provide the training needed for students to demonstrate mastery of the core competencies of manufacturing production at the front-line (entry-level through front-line supervisor), with an additional focus on Computer Numeric Control (CNC) equipment design, operation and maintenance.

- The Certified Production Technician (CPT) portion of the program consists of four individual certificate modules: Safety; Quality Practices & Measurement; Manufacturing Processes & Production; Maintenance Awareness.
- The CNC portion consists of two modules: an introduction to CNC design software (Solidworks), and an introduction to CNC Machining.

The goal of the Manufacturing Skills Program is to raise the level of performance of production workers both to assist the individuals in finding higher-wage jobs and to help employers ensure their workforce increases the company’s productivity and competitiveness.

Entrance Requirement:
Math at 9th grade level or higher (TABE 9.0 or higher), and Reading at 10th grade level or higher (TABE 10.0 or higher)

Program Awards: MSSC Certified Production Technician Credential 429 Hours

Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Required Course Work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>MFGS 1100 Safety Awareness</td>
<td>66</td>
</tr>
<tr>
<td>MFGS 1200 Manufacturing Processes and Procedures</td>
<td>66</td>
</tr>
<tr>
<td>MFGS 1300 Quality Practices</td>
<td>66</td>
</tr>
<tr>
<td>MFGS 1400 Maintenance Awareness</td>
<td>66</td>
</tr>
<tr>
<td>MFGS 1500 Introduction to CNC Design – SolidWorks</td>
<td>60</td>
</tr>
<tr>
<td>MFGS 1600 Introduction to CNC Machining</td>
<td>45</td>
</tr>
</tbody>
</table>

Program Courses:
GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisites: None

MFGS 1100 Safety Awareness 66 Hours
This course is designed to align with the Manufacturing Skill Standards Council’s (MSSC) assessment and certification system for Safety. The course curriculum is based upon federally-endorsed national standards for production workers. This course will introduce OSHA standards relating to personal protective equipment, HAZMAT, tool safety, confined spaces, and others.
Prerequisite: None
MFGS 1200 Manufacturing Process and Production 66 Hours
This course is designed to align with the Manufacturing Skill Standards Council’s (MSSC) assessment and certification system for Manufacturing Processes. The course curriculum is based upon federally-endorsed national standards for production workers. This course emphasizes Just-In-Time (JIT) manufacturing principles, basic supply chain management, communication skills, and customer service.
Prerequisite: None

MFGS 1300 Quality Practices 66 Hours
This course is designed to align with the Manufacturing Skill Standards Council’s (MSSC) assessment and certification system for Quality Practices. The course curriculum is based upon federally-endorsed national standards for production workers. Emphasis is placed on Continuous Improvement concepts and how they relate to a quality management system. Students will be introduced to a quality management system and its components. These include corrective actions, preventative actions, control of documents, control of quality records, internal auditing of processes, and control of nonconforming product.
Prerequisite: None

MFGS 1400 Maintenance Awareness 66 Hours
This course is designed to align with the Manufacturing Skill Standards Council’s (MSSC) assessment and certification system for Maintenance Awareness. The course curriculum is based upon federally-endorsed national standards for production workers. The Maintenance Awareness course introduces the concepts of Total Productive Maintenance and preventative maintenance. Students are introduced to lubrication, electricity, hydraulics, pneumatics, and power transmission systems.
Prerequisite: None

MFGS 1500 Introduction to CNC Design – Solidworks 60 Hours
This course will introduce the students to computer operated machinery. The student will learn to layout and draw projects using computers, apply tool paths for various operations, and set up a CNC router to perform operations.
Prerequisite: CPT Certificate

MFGS 1600 Introduction to CNC Machining 45 Hours
This course is an introduction to CNC machining. The focus will center on CNC machining and will include the history of CNC machining, G & M codes, programming, set-up and operating procedures.
Prerequisite: CPT Certificate
# MASONRY PROGRAM

**Location:** SCL

**Program Focus:**
This program focuses on learning the basic fundamentals of Brick and Block work. Skill areas include scaffold construction; planing and leveling walls; laying to the line; arch building; fire place construction; chimney layout and design; garden wall layout; designing different types of masonry walls; and exploring the history of the masonry trade and mortar types. Graduates of this program will have the option of exploring employment in Union or Non-Union positions.

**Entrance Requirements:**
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

**Physical Demands:** Must be able to lift 75 pounds.

**Program Awards:**

<table>
<thead>
<tr>
<th>Certificate</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Basic Block Laying Skills Certificate</td>
<td>210</td>
</tr>
<tr>
<td>Basic Brick Certificate</td>
<td>240</td>
</tr>
<tr>
<td>Advance Brick Certificate</td>
<td>255</td>
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<tr>
<td>*First Aid &amp; OSHA 30 Construction Certificate</td>
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**Awarding Establishment:**

**Century College**

<table>
<thead>
<tr>
<th>Certificate</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Basic Block Laying Skills Certificate</td>
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</tr>
<tr>
<td>MASN 1502 Intro to Masonry</td>
<td>30</td>
</tr>
<tr>
<td>MASN 1506 Hand and Power Tools</td>
<td>30</td>
</tr>
<tr>
<td>CARP 2538 Intro to Block-Laying</td>
<td>15</td>
</tr>
<tr>
<td>CARP 2538.1 Block Leads</td>
<td>30</td>
</tr>
<tr>
<td>MASN 1510 Mortar Mixing and Spreading</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1510.1 Spreading Application and Technique</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1518 Intro to Bricklaying</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1518.1 Brick Corner and Wall</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1522 Brick Leads I</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1522.1 Brick Leads II</td>
<td>30</td>
</tr>
<tr>
<td>Basic Brick Certificate</td>
<td></td>
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<tr>
<td>MASN 1514 Pointing and Cleaning Brick/Block</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1514.1 Cleaning Brick Work</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1526 Brick Piers I</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1526.1 Brick Piers II</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1530 Pattern Bonds</td>
<td>30</td>
</tr>
<tr>
<td>MASN 1534 Steps and BUTTRESSES</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1534.1 Brick Sidewalls and Patios</td>
<td>30</td>
</tr>
<tr>
<td>MASN 1538 House Veneering</td>
<td>45</td>
</tr>
<tr>
<td>MASN 1542 Fireplaces I</td>
<td>30</td>
</tr>
<tr>
<td>MASN 1542.1 Fireplaces II</td>
<td>30</td>
</tr>
<tr>
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<td>Course Title</td>
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<tr>
<td>MASN 1502</td>
<td>Introduction to Masonry</td>
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<tr>
<td>MASN 1506</td>
<td>Hand and Power Tools</td>
</tr>
<tr>
<td>CARP 2538</td>
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<tr>
<td>CARP 2538.1</td>
<td>Block Leads</td>
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<tr>
<td>MASN 1510</td>
<td>Mortar Mixing &amp; Spreading</td>
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<tr>
<td>MASN 1518</td>
<td>Introduction to Bricklaying</td>
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<tr>
<td>MASN 1518.1</td>
<td>Brick Corners and Walls</td>
</tr>
<tr>
<td>MASN 1546</td>
<td>Brick Arch Construction</td>
</tr>
<tr>
<td>MASN 1550</td>
<td>Stone Work Application</td>
</tr>
<tr>
<td>MASN 1550.1</td>
<td>Stone Veneer I</td>
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<tr>
<td>MASN 1550.2</td>
<td>Stone Veneer II</td>
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<tr>
<td>CARP 1510</td>
<td>Building Layout and Foundation Tech</td>
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<tr>
<td>MASN 1554</td>
<td>Plan Reading and Drawing</td>
</tr>
<tr>
<td>MASN 1560</td>
<td>Specify Application in Brick/Block</td>
</tr>
<tr>
<td>OSHA 1130</td>
<td>OSHA 30 Construction Course</td>
</tr>
</tbody>
</table>

**Program Courses:**

**MASN 1502 Introduction to Masonry (30 Hours)**
This course is designed to introduce the student to the various safety measures, tools, and procedures they will encounter in the masonry trade. Prerequisite: None

**MASN 1506 Hand and Power Tools (30 Hours)**
This course is designed to teach the student the basic use of hand and power tools in the masonry trade. Prerequisite: None

**CARP 2538 Introduction to Block Laying (15 Hours)**
This course provides the history and instruction in the procedures and practices necessary for safe operation and use of tools, materials, and equipment in block masonry. This course introduces students to basic skills in mixing mortar, spreading and applying mortar to masonry units, and cutting masonry units. Prerequisites: None

**CARP 2538.1 Block Leads (30 Hours)**
Students will study the manufacturing process of block and concentrate on techniques for laying concrete block, while emphasis is placed on block corners and laying block to a line with proper mortar joints. Students will also study the essentials of bonding. Prerequisites: None

**MASN 1510 Mortar Mixing & Spreading (15 Hours)**
The course includes the different materials and quantities used to mix and apply setting bed, scratch, float, and bond coats. Topics include: scratch coat, screed strips, float coat, and bond coat. Prerequisite: None

**Advanced Brick Certificate**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MASN 1546</td>
<td>Brick Arch Construction</td>
<td>45</td>
</tr>
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<td>MASN 1550</td>
<td>Stone Work Application</td>
<td>15</td>
</tr>
<tr>
<td>MASN 1550.1</td>
<td>Stone Veneer I</td>
<td>15</td>
</tr>
<tr>
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<td>Stone Veneer II</td>
<td>30</td>
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<td>Specify Application in Brick/Block</td>
<td>90</td>
</tr>
<tr>
<td>OSHA 1130</td>
<td>OSHA 30 Construction Course</td>
<td>45</td>
</tr>
</tbody>
</table>

**MASN 1510.1 Spreading Application and Technique (15 Hours)**
This course is designed to introduce the student to the correct procedures of mixing mortar and applying it correctly to the masonry units. Prerequisites: None

**MASN 1514 Pointing and Cleaning Brick and Block (15 Hours)**
This course presents techniques for pointing, cleaning, and caulking masonry using commercial grade products. Topics include: pointing, cleaning, and caulking. Prerequisites: Block I and Brick I

**MASN 1514.1 Cleaning Brick Work (15 Hours)**
This course introduces the student to diagnosing problems that would require tuck-pointing. The cleaning of brickwork is also covered. Prerequisites: None

**MASN 1518 Introduction to Bricklaying (15 Hours)**
This course introduces basic skills in mortar mixing, spreading and applying mortar to masonry units, and cutting masonry units. Topics include: procedures to mix mortar, spread mortar, butter brick and block, and cut masonry units. Prerequisite: None

**MASN 1518.1 Brick Corners and Walls (15 Hours)**
This course is designed to introduce the student to the fundamentals of laying brick to the line, building leads and corners, and laying out a brick foundation or wall to industry standards according to building codes. Prerequisite: None
MASN 1522 Brick Leads I 15 Hours
This course is designed to develop the fundamentals of laying brick to the line, building leads and corners, and laying out a brick foundation or wall using basic patterns. Prerequisite: None

MASN 1522.1 Brick Leads II 30 Hours
This course covers correct procedure for leveling, plumbing and squaring brick leads and corners using several different sizes of brick. Prerequisites: Brick Leads I

MASN 1526 Brick Piers I 15 Hours
This course is designed to introduce the student to the correct procedures for building brick piers to square, plum, level and to a given height for a basic bond and pattern design. Prerequisite: None

MASN 1526.1 Brick Piers II 15 Hours
This advanced course is designed to enhance correct procedures for building brick piers to square, plum, level and for all seven structural bonds and more advanced patterns for corners and leads. Prerequisites: Brick Piers I

MASN 1530 Pattern Bonds 30 Hours
This course teaches the student different ways to position brick in the wall to create patterns that are used for structural, as well as decorative purposes. Prerequisites: None

MASN 1534 Steps and Buttresses 15 Hours
This course provides experience in the design and construction of selected ornamental masonry structures for steps and buttresses. Topics include materials and construction techniques. Prerequisites: None

MASN 1534.1 Brick Sidewalks and Patios 30 Hours
This course covers the fundamentals of building brick steps, buttresses, sidewalks and patios. Prerequisites: None

MASN 1538 House Veneering 45 Hours
This course is designed to introduce the student to the fundamentals of laying out the height and length of windows and doors of a house that is to be veneered with brick. The procedures for erecting a scaffold are also taught. Prerequisites: None

MASN 1542 Fireplaces I 30 Hours
This course provides instruction in the design and construction of fireplaces and chimneys. Topics include: types of design, foundation plans, firebox types, mantle/hearth designs, chimney types, and fireplace inserts. Prerequisites: None

MASN 1542.1 Fireplaces II 30 Hours
This course is designed to introduce the student to the fundamentals of designing and building a single, double, and heat circulating fireplace. Building codes are also covered in regards to construction and inspection standards. Prerequisites: Fireplaces I

MASN 1546 Brick Arch Construction 45 Hours
This course covers five (5) basic styles of arches, the building of templates, and the actual construction of the arch. Prerequisites: None

MASN 1550 Stone Work Application 15 Hours
This course provides experience in the design and construction of selected stone masonry structures. Topics include: materials and construction techniques for stone masonry. Prerequisites: None

MASN 1550.1 Stone Veneer I 15 Hours
This course is designed to introduce students in the ways of stone patterns, stone cutting, and the various uses of stone construction throughout the industry and the ages. Prerequisites: None
MASN 1550.2 Stone Veneer II  
This course is designed to instruct students in the methods of stone patterns, stone cutting, and the various uses of stone construction throughout the industry including modern techniques.
Prerequisites: Stone Veneer I

CARP 1510 Building Layout & Foundation Technology  
This course will introduce the student to advanced building layouts and foundation technology for use in masonry.
Prerequisites: None

MASN 1554 Plan Reading and Drawing  
This course is designed to introduce the student to basic plan reading and drawing with its application, as used in the bricklaying trade.
Prerequisites: None

MASN 1560 Specify Application in Brick and Block  
This course is designed for the student who wants to enhance skills and knowledge in order to become more proficient in specialized areas of the curriculum. Specialized lab content must be different from or beyond the expected skill level available in current course offerings. The student will have the ability to direct efforts, with instructor approval, in curriculum activities that meet student needs. The student and the instructor must sign a “specialized lab training agreement.”
Prerequisites: None

OSHA 1130 OSHA 30 Construction Course  
The OSHA 30-hour Construction Industry Outreach Training course is a comprehensive safety program designed for anyone involved in the construction industry. Specifically devised for construction employees with safety responsibilities, the program provides complete information on OSHA compliance issues.
Prerequisites: None
PAINTING AND DECORATING PROGRAM

Location: RC

Program Focus:
This program focuses on learning the basic fundamentals of painting and painting skills. Skill areas include scaffold construction; brush, roller, and spray techniques; drywall finishing; wood finishing; and blueprint reading. Graduates of this program can expect to find employment in the building trade area working on industrial structures and commercial buildings. Graduates of this program may apply for apprenticeship training with the painter's union.

Entrance Requirement:
Reading at 10th grade level or higher (TABE 10.0 or higher)

Physical Demands: Must be able to climb ladders.

Awards Offered:
- Principles of Painting Certificate 540 Hours
- Painting and Decorating Diploma 480 Hours

Awarding Establishment:
Century College

<table>
<thead>
<tr>
<th>Principles of Painting Certificate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
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</tr>
<tr>
<td>PTG 1000 Introduction to Painting</td>
<td>96</td>
</tr>
<tr>
<td>PTG 1010 Spray Painting I</td>
<td>64</td>
</tr>
<tr>
<td>PTG 1020 Drywall Finishing</td>
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</tr>
<tr>
<td>PTG 1030 Blueprint Reading</td>
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</tr>
<tr>
<td>PTG 1040 Wood Finishing</td>
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</tr>
<tr>
<td>PTG 1050 Ladders and Scaffolding</td>
<td>32</td>
</tr>
<tr>
<td>PTG 1140 Spray Painting II</td>
<td>96</td>
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</table>

<table>
<thead>
<tr>
<th>Painting and Decorating Diploma</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>PTG 1100 Introduction to Painting II</td>
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<tr>
<td>PTG 1110 Abrasive Blasting</td>
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<tr>
<td>PTG 1200 Finishing Masonry Surfaces</td>
<td>64</td>
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<tr>
<td>PTG 1210 Finishing Metal Surfaces</td>
<td>64</td>
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<tr>
<td>PTG 1220 Production Painting</td>
<td>224</td>
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</tbody>
</table>
Program Courses:

GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.
Prerequisite: None

PTG 1000 Introduction to Painting 96 Hours
This course will provide the student with an overview of the painting and decorating industry and introduce the student to the tools of the trade, basic surface preparation methods and the application of coatings.
Prerequisite: None

PTG 1010 Spray Painting I 64 Hours
This course will introduce the student to the use and maintenance of conventional and HVLP spray equipment using compressed air to atomize the paint.
Prerequisite: None

PTG 1020 Drywall Finishing 96 Hours
This course will introduce the student to the use of drywall finishing tools and the preparation of gypsum surfaces to receive textures and coatings.
Prerequisite: None

PTG 1030 Blueprint Reading 32 Hours
In this course, students are introduced to reading and understanding blueprints as they pertain to the painting and decorating industry.
Prerequisite: None

PTG 1040 Wood Finishing 64 Hours
This course will introduce the student to surface preparation methods and coating application techniques for wood to be finished.
Prerequisite: None

PTG 1050 Ladders and Scaffolding 32 Hours
This course covers the safe use and construction of ladders and scaffolding.
Prerequisite: None

PTG 1100 Introduction to Painting II 96 Hours
This course introduces the student to generic coatings and their recommended applications.
Prerequisite: None

PTG 1110 Abrasive Blasting 32 Hours
This course will introduce the student to the operation and maintenance of abrasive blast equipment.
Prerequisite: None

PTG 1140 Spray Painting II 96 Hours
This course will introduce the student to the use and maintenance of airless spray equipment.
Prerequisite: None

PTG 1200 Finishing Masonry Surfaces 64 Hours
This course will introduce the student to the surface preparation methods and the application of finish coatings to plaster and masonry surfaces.
Prerequisite: Principles of Painting Certificate

PTG 1210 Finishing Metal Surfaces 64 Hours
This course will introduce the student to the surface preparation methods and the application of finish coatings to metal surfaces.
Prerequisite: Principles of Painting Certificate

PTG 1220 Production Painting 224 Hours
The course will introduce the student to advanced new construction and job site production painting.
Prerequisite: Principles of Painting Certificate
SOLAR PANEL INSTALLATION

Location: WR

Program Focus:
This program trains individuals to provide site-specific renewable energy assessment, PV installation, and consumer education skills training needed by professionals engaging consumers in solar PV systems for their homes or businesses. Students will learn the skills of site assessors and PV installation and will learn to do the following:

- Evaluate the energy consumption of a household or business, as well as the solar resource at the location
- Help clients understand their system options and benefits
- Work with clients to recommend the site and size of the solar PV system
- Estimate system production and identify costs, incentives, and financing options available.

The certificate will provide a credential that establishes an entry-level competency that is valuable to employers in the renewable energy field. Upon completion, students qualify to sit for the North American Board of Certified Energy Practitioners (NABCEP) PV Associate Exam, an increasingly sought-after solar credential valued by the industry.

Entrance Requirement:
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

Physical Demands: Must be able to climb ladders and lift 40 pounds.

Awards Offered:
Solar PV Certificate 108 Hours

Awarding Establishment:
Midwest Renewable Energy Association

<table>
<thead>
<tr>
<th>Solar PhotoVoltaic Certificate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSHR 1000 Workplace Human Relations</td>
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<tr>
<td>PV 201 PV Site Assessment</td>
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</tr>
<tr>
<td>PV 202 PV System Design</td>
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<tr>
<td>PV 204 PV Labs and Design Scenarios</td>
<td>8</td>
</tr>
<tr>
<td>PV 280 Safety and Best Practices for PV Installers</td>
<td>2</td>
</tr>
<tr>
<td>PV 220 PV Exam Prep</td>
<td>6</td>
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</tbody>
</table>
Program Courses:

GSHR 1000 Workplace Human Relations 60 Hours
This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with coworkers, supervisors, and customers.
Prerequisite: None

PV 101 Basic Photovoltaics 8 Hours
This 8-hour course uses a combination of lecture and classroom activities to teach the basics of photovoltaic (PV) systems. Participants will learn how PV systems work, diagram the four PV system types, describe and identify components, understand the best application and limitations of each system type, define the solar window, make energy efficiency recommendations, estimate system loads, and understand the basics of PV site assessment. Prerequisite: None

PV 201 PV Site Assessment 8 Hours
This 8-hour course uses classroom discussion, exercises, and activities to demonstrate how to perform a PV site assessment for a home or small business, using the MREA PV Site Assessment Report Template. Topics covered include: load profiles and consumption history, energy efficiency and fuel switching opportunities, site-specific shade analysis, array and balance of system location recommendation parameters, and client financing options. Participants will learn how to access and use online tools for assessing the solar resource, perform site-specific PV system sizing, determine energy production of a recommended PV system size, estimate system costs, and evaluate existing infrastructure on the site.
Prerequisite: Basic Photovoltaics

PV 202 PV System Design 16 Hours
This 16-hour course will teach you the basic principles of PV system design and installation. Participants will learn basic installation techniques, including system sizing, system layout, battery connections, safety, and basic line drawings. Participants will size, connect, and test a small battery-based DC system and an AC grid intertie system.
Prerequisite: Basic Photovoltaics

PV 204 PV Labs and Design Scenarios 8 Hours
This 8-hour course is designed to demonstrate PV system design principles learned in PV System Design (PV 202) through construction of two portable lab systems. Participants will work from line diagrams and component specification sheets to build a grid-interconnected PV system and a battery-based PV system. After assembly, students will verify proper mechanical and electrical connections and commission each system. In addition, students will work in small teams to develop PV system designs that meet site analysis, system sizing, and configuration requirements given in several design scenarios.
Prerequisite: Basic Photovoltaics and PV System Design

PV 280 Safety and Best Practices for PV Installers 2 Hours
This 2-hour course covers basic safety and ergonomic best-practices for a PV installer. It includes many of the task steps listed in the NABCEP PV Associate Job Task Analysis (JTA). Presentations, examples, photos, videos, and many resources were provided by the University of Wisconsin-Milwaukee CARGI (Consortium for Advanced Research in Gas Industries) Program. Materials were produced under grant #SH-29664-60-F-55 and #SH 24880-SH3 from the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor.
Prerequisite: None

PV 220 PV Exam Prep 6 Hours
This 6-hour course has been created for those ready to take the NABCEP PV Associate Exam, or any entry-level exam in photovoltaics. We’ll discuss test-taking strategies, review the logistics of NABCEP exams, and use practice questions to prepare you for test day.
Prerequisite: Basic Photovoltaics, PV Site Assessment and PV System Design
WELDING

Location: STW

Program Focus:
The Welding Program’s main focus is to prepare students for an entry level position in the welding/fabrication industry. Students learn the basic skills needed to be successful in a modern workplace including shop safety, power source identification, welding theory, oxyfuel welding/cutting, plasma cutting, GMAW short arc and spray arc on mild steel, stainless steel and aluminum, GMAW flux core, SMAW steel, GTAW mild steel, stainless steel and aluminum. Program also includes introduction to pipe and fabrication. All testing and certification is done to American Welding Society D1.1 and API 1104 standards.

Entrance Requirement:
Reading and Math at 9th grade level or higher (TABE 9.0 or higher)

Physical demands: Must be able to lift 100 pounds; must achieve a score of 50% or higher on a Mechanical Aptitude test.

Awards Offered:
Level I Basic Certificate 720 Hours
Level II Intermediate Certificate 736 Hours
Level III Advanced Certificate 736 Hours
American Welding Society Entry Level Welder Certification 120 Hours

Awarding Establishment: Century College

WELDING Level I

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<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Hours</th>
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<tbody>
<tr>
<td>GSHR 1000</td>
<td>Workplace Human Relations</td>
<td>60</td>
</tr>
<tr>
<td>WELD 1010</td>
<td>Shop Safety</td>
<td>30</td>
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<tr>
<td>WELD 1015</td>
<td>Oxygen/Acetylene Cutting Torch</td>
<td>24</td>
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<td>WELD 1020</td>
<td>Propylene Automatic Torch</td>
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<td>WELD 1025</td>
<td>Plasma Torch</td>
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<td>WELD 1030</td>
<td>Oxygen/Acetylene Welding and Brazing</td>
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<td>WELD 1035</td>
<td>Carbon Arc Cutting</td>
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<td>WELD 1040</td>
<td>Shielded Metal Arc Welding</td>
<td>168</td>
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<tr>
<td>WELD 1045</td>
<td>Gas Metal Arc Welding - Short Arc</td>
<td>40</td>
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<tr>
<td>WELD 1050</td>
<td>Gas Metal Arc Welding - Spray Arc</td>
<td>40</td>
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<td>WELD 1055</td>
<td>Gas Metal Arc Welding - Pulse Arc</td>
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<tr>
<td>WELD 1060</td>
<td>Gas Metal Arc Welding - Flux Core/Metal Core</td>
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<td>Gas Tungsten Arc Welding - Mild Steel, Stainless Steel and Aluminum</td>
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WELDING Level II

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<td>WELD 1110</td>
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<td>WELD 1120</td>
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<td>Gas Metal Arc Welding - Spray Arc</td>
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<td>WELD 1130</td>
<td>Gas Metal Arc Welding - Pulsed Arc</td>
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<td>WELD 1135</td>
<td>Gas Metal Arc Welding - Flux Core/Metal Core</td>
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<td>WELD 1140</td>
<td>Gas Tungsten Arc Welding - Mild Steel, Stainless Steel and Aluminum</td>
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### Program Courses:

**GSHR 1000 Workplace Human Relations**

60 Hours

This course examines interpersonal relationship skills in the work environment. Students evaluate individual strengths and weaknesses and then assess and learn transferable skills. This course emphasizes employment-enhancing skills that include understanding and improving relationships and communication with co-workers, supervisors, and customers.

Prerequisite: None

### Welding Level III

<table>
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<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>WELD 1145</td>
<td>Shop Math</td>
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<td>Shielded Metal Arc Welding</td>
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<td>WELD 1215</td>
<td>Shielded Metal Arc Welding - Bend Test</td>
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<td>Shielded Metal Arc Welding - Pipe Test</td>
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<td>Gas Metal Arc Welding - Short Arc Welding</td>
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<td>Gas Metal Arc Welding - Pulsed Arc</td>
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<td>WELD 1235</td>
<td>Gas Metal Arc Welding - Stainless Steel Short Arc/Spray Arc</td>
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<td>WELD 1240</td>
<td>Gas Metal Arc Welding - Stainless Steel Flux Core</td>
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<td>WELD 1245</td>
<td>Gas Metal Arc Welding - Aluminum</td>
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<td>WELD 1250</td>
<td>FCAW- Bend Test in accordance with AWS D1.1</td>
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<td>WELD 1255</td>
<td>Gas Metal Arc Welding - Mild Steel Stainless Steel and Aluminum</td>
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<td>WELD 1260</td>
<td>Blueprint Reading</td>
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<td>WELD 1265</td>
<td>Final Project</td>
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### American Welding Society Entry Level Welder

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<td>AWSEDU1</td>
<td>FCAW Carbon Steel</td>
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<td>AWSEDU2</td>
<td>GMAW Spray Arc Carbon Steel</td>
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<td>AWSEDU3</td>
<td>GTAW Carbon Steel</td>
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<td>AWSEDU4</td>
<td>GMAW Short Arc Carbon Steel</td>
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<tr>
<td>AWSEDU5</td>
<td>GTAW Stainless Steel</td>
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<td>AWSEDU6</td>
<td>SMAW Carbon Steel Test Plate Horizontal</td>
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<tr>
<td>AWSEDU7</td>
<td>SMAW Carbon Steel Test Plate Vertical</td>
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**WELD 1010 Shop Safety**

30 Hours

Designed to teach students how to select proper safety equipment, correct use of hand tools, MSDS identification introduction to metallurgy and weld process identification.

Prerequisite: None

**WELD 1015 Oxygen/Acetylene Cutting Torch**

24 Hours

Students learn to set up, operate and shut down the oxygen acetylene cutting torch using a specific shop procedure.

Prerequisite: Shop Safety

**WELD 1020 Propylene Automatic Torch**

24 Hours

Students learn to cut bevels and size 3/8” and thicker plate using the automatic torch equipment.

Prerequisite: Shop Safety
WELD 1025 Plasma Torch 24 Hours
Students learn to select correct safety equipment, set up, operate and shut down the hand-held plasma torch.
Prerequisite: Shop Safety

WELD 1030 Oxygen/Acetylene Welding and Brazing 50 Hours
Students learn how to join mild steel in the flat position using a combination torch to manually weld and braze metal together.
Prerequisite: Shop Safety

WELD 1035 Carbon Arc Cutting 24 Hours
Students learn to cut and gouge steel for demolition work and weld qualification plate processing.
Prerequisite: Shop Safety

WELD 1040 Shielded Metal Arc Welding 168 Hours
Students learn basic power source functions, welding electrical theory and selection of the correct electrode.
Prerequisite: Shop Safety

WELD 1045 Gas Metal Arc Welding - Short Arc Welding 40 Hours
Students learn about power source identification, GMAW welding theory and material layout.
Prerequisite: Shop safety

WELD 1050 Gas Metal Arc Welding - Spray Arc 40 Hours
Students understand and are able to explain the spray arc method of transfer and the effects tip recess, electrode extension and inductance have on weld quality and appearance.
Prerequisite: Shop safety

WELD 1055 Gas Metal Arc Welding - Pulse Arc 40 Hours
Students Learn equipment identification, pulse spray transfer and gas metal arc welding theory during this course.
Prerequisite: Shop safety

WELD 1060 Gas Metal Arc Welding – Flux Core/Metal Core 46 Hours
Students learn material identification and the correct method of through-the-arc material transfer during this section.
Prerequisite: Shop safety

WELD 1065 Gas Tungsten Arc Welding – Mild Steel, Stainless Steel and Aluminum 150 Hours
Students learn to select correct safety equipment; explain the correct welding procedures used for welding different materials; and learn the different types of equipment and settings used for mild steel, stainless steel and aluminum.
Prerequisite: Shop safety
WELD 1110 Shielded Metal Arc Welding  
**180 Hours**  
Students learn more advanced power source functions and identification, welding electrical theory and selection of the correct electrode for welding in the horizontal and vertical up position/progression.  
Prerequisite: Shop Safety, Level I

WELD 1120 Gas Metal Arc Welding - Short Arc Welding  
**60 Hours**  
Students learn about power source identification, welding theory and equipment maintenance. All welds are performed in the horizontal and vertical up position/progression.  
Prerequisite: Shop safety, Level I

WELD 1125 Gas Metal Arc Welding - Spray Arc  
**60 Hours**  
Students are able to understand and explain the different method of transfer and the effects tip recess, electrode extension and inductance have on weld quality and appearance. Welds are performed in the horizontal and vertical up position/progression.  
Prerequisite: Shop safety, Level I

WELD 1130 Gas Metal Arc Welding - Pulsed Arc  
**60 Hours**  
Students are able to understand and explain the pulse method of transfer and the effects tip recess, electrode extension and inductance have on weld quality and appearance, welding in the horizontal and vertical up position/progression.  
Prerequisite: Shop safety, Level I

WELD 1135 Gas Metal Arc Welding – Flux Core/Metal Core  
**66 Hours**  
Understand and be able to explain the different applications for the flux core/metal core wires. Choose correct consumables and perform light machine maintenance. All welds are done in the horizontal and vertical up position/progression.  
Prerequisite: Shop safety, Level I

WELD 1140 Gas Tungsten Arc Welding – Mild Steel, Stainless Steel and Aluminum  
**160 Hours**  
Students are able to explain each function on the welding machine and what it is used for. All welding on mild steel, stainless steel, and aluminum is done in the horizontal and vertical up position/progression.  
Prerequisite: Shop safety, Level I

WELD 1145 Shop Math  
**150 Hours**  
Students learn math skills commonly used in the metal working field, such as material layout, calculating weights, area and volume on cube and cylindrical shapes.  
Prerequisites: Level I

WELD 1210 Shielded Metal Arc Welding  
**136 Hours**  
Students learn to work from weld procedures while performing all of their welds in the overhead position. More advanced power theory and equipment maintenance is learned in this section.  
Prerequisite: Shop safety, Level II

WELD 1215 Shielded Metal Arc Welding-Bend Test  
**40 Hours**  
Upon completion of this section students will have passed a horizontal fixed SMAW B1V1 7018 weld on 3/8” plate with backing strip in accordance with AWS D1.1 acceptance criteria.

WELD 1220 Shielded Metal Arc Welding-Pipe Test  
**40 Hours**  
Upon completion of this section students will have passed a horizontal fixed SMAW B1V1 7018 open root weld on 2 ½” pipe in accordance with API 1104 acceptance criteria.

WELD 1225 Gas Metal Arc Welding-Short Arc Welding  
**50 Hours**  
Students learn advanced welding power source equipment maintenance. All welds are performed in the overhead position.  
Prerequisite: Shop safety, Level II
WELD 1230 Gas Metal Arc Welding-Pulsed Arc  
50 Hours  
Students understand and are able to explain the advanced menu settings on the welding equipment and the effects they have on method of transfer and weld quality and appearance. All welding is done in the overhead position.  
Prerequisite: Shop safety, Level II

WELD 1235 Gas Metal Arc Welding-Stainless Steel Short Arc/Spray Arc  
70 Hours  
Students are able to perform short arc, spray arc welds in the flat horizontal, vertical up, and overhead position. Advanced welding theory and power source maintenance are stressed in this section.  
Prerequisite: Level II

WELD 1240 Gas Metal Arc Welding-Stainless Steel Flux Core  
40 Hours  
Students are able to perform GMAW stainless steel flux core welds in the flat horizontal and vertical up position. Advanced welding theory and power source maintenance are stressed in this section.  
Prerequisite: Level II

WELD 1245 Gas Metal Arc Welding-Aluminum  
40 Hours  
Students will be able to explain the difference between spray, pulse spray and short arc transfer on aluminum. Welds are completed in the flat horizontal, vertical up, and overhead position.  
Prerequisite: Level II

WELD 1250 FCAW- Bend Test in accordance with AWS D1.1  
40 Hours  
Upon completion of this section students will have passed a horizontal fixed FCAW B1VI 71T1 weld on 3/8" plate with backing strip in accordance with AWS D 1.1 acceptance criteria.

WELD 1255 Gas Metal Arc Welding-Mild Steel Stainless Steel and Aluminum  
110 Hours  
Students are able to explain the advanced equipment menu settings as they relate to each function on the welding machine and what it is used for. Welding on mild steel stainless steel and aluminum is completed in the overhead position.  
Prerequisite: Level II

WELD 1260 Blueprint Reading  
60 Hours  
Students will be able to read and interpret various types of technical drawings and blueprints. A basic understanding of scales and tolerances, AWS welding symbols and explanation of different views is essential for completing this course.  
Prerequisite: Level II

WELD 1265 Final Project  
60 Hours  
Students take a viable project from concept, through design and on to completion. Grades are based on originality, completeness of blueprint and tolerance/quality of completed part per blueprint.

AMERICAN WELDING SOCIETY ENTRY LEVEL WELDER CERTIFICATION  
105 Hours  
Entry Level Welder Certification is achieved once a student has successfully completed the requirements for Level III. Eight additional practical projects are completed and inspected prior to a Certification request from AWS.