

WELDING AND METALS FABRICATION (WEMF)

QUICK FACTS: WEMF COURSES

- **Instructional School:** Industry, Engineering, and Trades
- **Department:** Manufacturing and Welding

WEMF 111 Safety and Leadership I

(1 Credit, Fall/Spring/Summer)

Learn the basics of welding lab and shop organization, safety procedures, hand and power tool identification, and proper usage and maintenance of equipment. Includes an introduction of the most effective ways to apply leadership skills and abilities within the industry. PREREQ: Welding and Metals Fabrication major. COREQ: WEMF 125, WEMF 135, and WEMF 155. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 112 Safety and Leadership II

(1 Credit, Fall/Spring/Summer)

Learn advanced welding safety procedures, workplace and jobsite safety principles, and safe use of metalworking saws. Includes an overview of the most effective ways to apply leadership skills and abilities within the industry. PREREQ: WEMF 111. COREQ: WEMF 126, WEMF 156, and WEMF 175. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 125 Blueprint Reading for Welders I

(1 Credit, Fall/Spring/Summer)

Introduction to the study of blueprint reading. Includes basic lines, views, dimensioning, bills of materials, structural shapes, and other views and sections on drawings. PREREQ: Welding and Metals Fabrication major. COREQ: WEMF 111, WEMF 135, and WEMF 155. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 126 Blueprint Reading for Welders II

(1 Credit, Fall/Spring/Summer)

Introduction to the study of weld symbols and abbreviations, basic joints for weldment fabrication, and weld types applied to various welding joints. PREREQ: WEMF 125. COREQ: WEMF 112, WEMF 156, and WEMF 175. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 127 Blueprint Reading for Welders III

(1 Credit, Fall/Spring/Summer)

Further study of blueprint reading with an emphasis on other types of welds, including plug and slot welds, edge welds, and surfacing welds. PREREQ: WEMF 126. COREQ: WEMF 157 and WEMF 180. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 128 Blueprint Reading for Welders IV

(1 Credit, Fall/Spring/Summer)

Further study of blueprint reading with an introduction to geometric dimensioning and tolerancing (GD&T). Includes applied metrics for welders, dual dimensioning, and international standard symbol. Also includes manual drafting and layout calculations. PREREQ: WEMF 127. COREQ: WEMF 158 and WEMF 185. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 135 Gas Metal Arc Welding (GMAW) Practical

(4 Credits, Fall/Spring/Summer)

Gas Metal Arc Welding (GMAW) covers shop safety and GMA welding of fillet and groove welds in all positions to American Welding Society (AWS) standards. Also covers manual cutting process including oxy-fuel, plasma cutting, and carbon arc cutting and gouging, with the focus on applying these fundamental skills to hands-on projects. Successful completion of this course may lead to certification in the GMAW process. PREREQ: Welding and Metals Fabrication major. COREQ: WEMF 111, WEMF 125, and WEMF 155. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 155 Welding Theory I

(1 Credit, Fall/Spring/Summer)

Topics include the setup and use of Gas Metal Arc Welding (GMAW) welding equipment, the theory of different welding processes, welding gases, joint design and configuration, welding positions, and welding currents and polarity. PREREQ: Welding and Metals Fabrication major. COREQ: WEMF 111, WEMF 125, and WEMF 135. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 156 Welding Theory II

(1 Credit, Fall/Spring/Summer)

Topics include setup and use of Shielded Metal Arc Welding (SMAW) and Flux-Cored Arc Welding (FCAW) welding equipment, joint design configuration, welding positions, and welding currents and polarity associated with them. Application of electrode identification, shop math, and related cutting processes are also covered. PREREQ: WEMF 155. COREQ: WEMF 112, WEMF 126, and WEMF 175. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 157 Welding Theory III

(1 Credit, Fall/Spring/Summer)

Learn the theory and application of Gas Tungsten Arc Welding (GTAW), as well as the setup and maintenance of GTA welding systems. Includes identification and proper usage of testing methods and welding code standards. PREREQ: WEMF 156. COREQ: WEMF 127 and WEMF 180. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 158 Welding Theory IV

(1 Credit, Fall/Spring/Summer)

Learn basic metallurgy, how to identify the weldability of different metals based on carbon content and alloying, and filler metal selection. PREREQ: WEMF 157. COREQ: WEMF 128 and WEMF 185. (1 lecture hours, 0 lab hours, 1 credits)

WEMF 175 Shielded Metal Arc Welding (SMAW) Practical

(4 Credits, Fall/Spring/Summer)

Shielded Metal Arc Welding (SMAW) covers fillet and groove welds in all positions to the American Welding Society (AWS) standards. Successful completion of this course may lead to certification in the SMAW process. PREREQ: WEMF 135. COREQ: WEMF 112, WEMF 126, and WEMF 156. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 180 Production Welding

(4 Credits, Fall/Spring/Summer)

Production Welding covers shop safety and welding with production processes (including Gas Metal Arc Welding-Spray [GMAW-S], Gas Metal Arc Welding-Pulse [GMAW-P], Flux Cored Arc Welding [FCAW], and Metal Cored Arc Welding [MCAW]), fillet and groove welds at production speeds, and feeds to American Welding Society (AWS) standards. Focus is placed on the application of fundamental welding skills to hands-on projects. Successful completion of this course may lead to certification in the GMAW-S process. PREREQ: WEMF 175. COREQ: WEMF 127 and WEMF 157. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 185 Gas Tungsten Arc Welding (GTAW) Practical

(4 Credits, Fall/Spring/Summer)

Gas Tungsten Arc Welding (GTAW) covers shop safety and GTA welding of fillet and groove welds in all positions to American Welding Society (AWS) standards. Focus is placed on the application of fundamental welding skills to hands-on projects. Successful completion of this course may lead to certification in the GTAW process. PREREQ: WEMF 180. COREQ: WEMF 128 and WEMF 158. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 225 Blueprint Reading and Layout V

(2 Credits, Fall/Spring/Summer)

Exploration of basic planning skills, including exercises in the production of planning documents to control a project and the extract of a bill of materials from a given drawing or instructions. Includes production of set drawings using AutoCAD and manual drafting. Also includes basic shearing machines and shearing operations, drilling machines and drilling operations, punches and punching systems, and tapping techniques. PREREQ: WEMF 128 and WEMF 158. COREQ: WEMF 255. (2 lecture hours, 0 lab hours, 2 credits)

WEMF 226 Blueprint Reading and Layout VI

(2 Credits, Fall/Spring/Summer)

Continuing development of shop planning skills and the production of planning and fabrication documents. Students study the correct use of, and underpinning knowledge in, cutting and forming techniques. Cutting techniques include basic plasma machine operation and programming. Forming techniques include safe and effective setup and use of press brake, finger brake (box and pan folder), rolling machines, and hand tools and forming techniques. PREREQ: WEMF 225. COREQ: WEMF 256. (2 lecture hours, 0 lab hours, 2 credits)

WEMF 227 Blueprint Reading and Layout VII

(2 Credits, Fall/Spring/Summer)

Further development of skills in shop planning, AutoCAD, and the production of more detailed planning and fabrication documents. Includes manual drafting by drawing out developments using parallel, radial, and triangulation techniques, culminating in the creation of a combination piece using these techniques. Also includes the production of patterns and blueprints, more advanced blueprint reading, weld inspection and code, and the production of jigs and fixtures. PREREQ: WEMF 226. COREQ: WEMF 257. (2 lecture hours, 0 lab hours, 2 credits)

WEMF 228 Blueprint Reading and Layout VIII

(2 Credits, Fall/Spring/Summer)

Application of acquired skills and knowledge to the planning and production of appropriate designs and documentation for a capstone project. Also includes metallurgy, cutting tools, cutting tool materials, and the correct and safe use of both mill and lathe. PREREQ: WEMF 227. COREQ: WEMF 258. (2 lecture hours, 0 lab hours, 2 credits)

WEMF 255 Welding and Fabrication Workshop I

(4 Credits, Fall/Spring/Summer)

Practical applications of welding and fabrication with an emphasis on the review of competency in four major welding processes commonly found in industry and standard fabrication equipment such as band saws, industrial shears/punches, and drills/mills. Project-based learning is utilized to accentuate key fabrication principles. The welding focus is on completing requirements to earn an advanced welding certification. PREREQ: WEMF 185. COREQ: WEMF 225. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 256 Welding and Fabrication Workshop II

(4 Credits, Fall/Spring/Summer)

Practical applications of welding and fabrication with an emphasis on the procedures and methods commonly found in the manufacturing industry, as well as the pre-fabrication equipment involved in cutting/forming/rolling material. Project-based learning is utilized to accentuate key fabrication and project management principles. The welding focus is on completing requirements to earn an advanced welding certification. PREREQ: WEMF 255. COREQ: WEMF 226. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 257 Welding and Fabrication Workshop III

(4 Credits, Fall/Spring/Summer)

Advanced practical applications of welding and fabrication with an emphasis on the procedures and methods commonly found in the manufacturing industry. Includes tooling and fixture design for production, advanced sheet and plate rolling, and advanced fit up and fabrication using shop tools and equipment. Project-based learning is utilized to accentuate key fabrication and project management principles. The welding focus is on completing requirements to earn a second advanced welding certification. PREREQ: WEMF 256. COREQ: WEMF 227. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 258 Welding and Fabrication Workshop IV

(4 Credits, Fall/Spring/Summer)

Advanced practical applications of welding and fabrication with an emphasis on the creation of a capstone lab project and the attainment of an advanced welding certification. Students will make full use of the available tools in the welding lab to plan, design, and create a project which will help prepare them for similar work in the welding industry and increase their knowledge of the entire fabrication process. Students will also prove their welding competency by completing the requirements to earn a second advanced welding certification. PREREQ: WEMF 257. COREQ: WEMF 228. (0 lecture hours, 12 lab hours, 4 credits)

WEMF 293 Welding and Metals Fabrication Internship

(1-3 Credits, Varies)

Internships allow students to apply learning to real-life career possibilities. Credits are earned through supervised fieldwork specifically related to a student's area of study. PREREQ: PERM/INST. (0 lecture hours, 3 lab hours, 1 credits)

WEMF 296 Welding and Metals Fabrication Independent Study

(1-10 Credits, Varies)

This is a term long project. Each credit hour is equivalent to 45 hours of work on a project. Students should make arrangements with the instructor in their field of interest. Before enrolling for independent study, a student must obtain approval of the department chair and dean, acting on the recommendation of the instructor who will be supervising the independent study. An Independent Study Registration Form must be completed and turned into a One Stop Student Services location before a student may register for this course. PREREQ: PERM/INST and submission of a completed Independent Study Registration Form. (0 lecture hours, 0 lab hours, 1 credits)

Refer to How to Read Course Descriptions for an explanation of elements found in the course descriptions above.