

1700023

Electromechanical Maintenance

COURSE INFORMATION

Credits:3

PREREQUISITES AND/OR COREQUISITES

None

COURSE DESCRIPTION

This course is a basic introduction to welding and cutting processes. Topics include: Shielded Metal Arc Welding, Gas Metal Arc Welding and Gas Tungsten Arc Welding. Cutting processes include Oxy-Fuel cutting and Plasma Arc cutting. Electric arc and oxy-fuel safety rules will be discussed.

COURSE GOALS

- I. Explain and demonstrate how to safely set up and operate oxy-fuel equipment.
- II. Explain and demonstrate how to safely operate electric arc welding and plasma cutting equipment.
- III. Demonstrate how to make fillet and groove welds with the SMAW process in the flat and horizontal position.
- IV. Demonstrate how to make fillet and groove welds with GMAW process in the flat and horizontal position.
- V. Demonstrate how to make fillet and groove welds with GTAW process in the flat position.
- VI. Demonstrate how to make straight and bevel cuts with the oxy-fuel cutting process.
- VII. Demonstrate how to make straight cuts with the Plasma cutting process.

STUDENT LEARNING OUTCOMES

- I. Oxy-Fuel Safety
 - A. Define or explain and apply safety rules for oxy-fuel equipment.
 - B. Define or explain and apply rules for safely using oxy-fuel equipment in an industrial setting.
- II. Electric Arc Welding and Cutting Safety
 - A. Define or explain and apply arc welding equipment safety rules.
 - B. Defines or explain and apply rules for using arc welding and cutting in an industrial setting.
- III. The Shielded Metal Arc Welding Process
 - A. Define or explain and apply the process variables for SMAW.
 - B. Define or explain and apply the operator variables for SMAW.
 - C. Make fillet and groove welds in the flat position.
 - D. Make fillet and groove welds in the horizontal position.
 - E. Define or explain and apply weld quality criteria to shop work.

- IV. The Gas Metal Arc Welding Process
 - A. Define or explain and apply the process variables for GMAW.
 - B. Define or explain and apply the operator variables for GMAW.
 - C. Make fillet and groove welds in the flat position.
 - D. Make fillet and groove welds in the horizontal position.
 - E. Define or explain and apply weld quality criteria to shop work.
- V. The Gas Tungsten Arc Welding Process
 - A. Define or explain and apply the process variables.
 - B. Define or explain and apply the operator variables.
 - C. Explain the welding characteristics of mild steel.
 - D. Explain the welding characteristics of stainless steel.
 - E. Make fillet and groove welds in the flat position on mild steel.
 - F. Make fillet and groove welds in the flat position on stainless steel.
 - G. Define or explain and apply weld quality criteria to shop work.
- VI. The Oxy-Fuel Cutting Process
 - A. Define or explain and apply the process variables.
 - B. Define or explain and apply the operator variables.
 - C. Make straight and bevel cuts.
 - D. Define or explain and apply weld quality criteria to shop work.
- VII. The Plasma Cutting Process
 - A. Define or explain and apply the process variables.
 - B. Define or explain and apply the operator variables.
 - C. Make straight cuts.
 - D. Define or explain and apply weld quality criteria to shop work.

COURSE MATERIALS

The Oxy-Acetylene Handbook, by ESAB Welding & Cutting Products Edition 3. Book 2 is New Lessons in ARC WELDING, Textbook, by THE LINCOLN ELECTRIC WELDING COMPANY, 4th Edition. Required equipment for Welding Lab is as follows.

1. Flip-Front Welding Helmet
2. Welding Jacket
3. Welding Gloves
4. Safety Glasses
5. Hand Heat Shields
6. Skull Cap
7. Steel Toe Boots

GRADING CRITERIA

Students can expect to be graded on Written Assignments, Quizzes, Tests, Lab Activities, and Attendance. There is currently no scheduled time available to make up classes or labs that are missed.

PARTICIPATION/ATTENDANCE POLICY

Students can expect that attendance/participation will be a part of their final grade, and determined by the instructor at his/her discretion. Students are encouraged to attend every class as regular attendance as it contributes to successful course completion and will impact the final grade.

COURSE EXPECTATIONS

For successful completion of this course, students are expected to Read Course Material, Complete all Assignments, Take Notes, Study and Participate in classroom discussions.

ACADEMIC INTEGRITY AND CONDUCT POLICY

The integrity of a class and program rests on the principle that the grades awarded to students must reflect only their own individual efforts and achievement. Students are required to perform the work specified by the instructor and are responsible for the content of work submitted, such as papers, reports, examinations, and other work. Violations of academic integrity include various types of plagiarism and cheating.

Plagiarism

Plagiarism includes, but is not limited to:

- Using exact words from a source without appropriate crediting
- Cutting and pasting electronically from any source without appropriate crediting
- Using wording and/or sentence structure too close to the original in paraphrasing
- Using visual images in whole or in part created by someone else without appropriate crediting
- Buying a paper and presenting any part of it as your own
- Borrowing any part of a paper and presenting it as your own without appropriate crediting
- Falsifying or inventing any information or citation in an academic exercise

Cheating

Cheating includes, but is not limited to:

- Obtaining or giving assistance in any academic work such as on quizzes, tests, homework, etc., without instructor's consent
- Taking a test or course or turning in work for someone else
- Allowing someone to take a test or course or turn in work in your name
- Using crib notes or electronic devices to get unauthorized assistance on tests or other in-class work
- Using work from another class or previous semester without instructor consent

CLASS CANCELLATION POLICY

Class meetings can occasionally be called off due to bad weather, check the local news and radio for information or call 319-296-4444 for the current status of college closings, class cancelations, delay start, or early dismissal information.

STUDENTS' SPECIAL NEEDS STATEMENT

Hawkeye Community College (HCC) strives for student-centered, quality education with flexibility to allow for students' special needs. Students with physical, mental, or learning disabilities should contact the Special Needs Coordinator in Student Services at 319-296-4014 or specialneeds@hawkeyecollege.edu to learn how to apply for accommodations at HCC. Or, visit our website for more information and forms: <http://www.hawkeyecollege.edu/students/services/student-disability-services/default.aspx>

NONDISCRIMINATION STATEMENT

Hawkeye Community College does not discriminate on the basis of sex; race; age; color; creed; national origin; religion; disability; sexual orientation; gender identity; genetic information; political affiliation; or actual or potential parental, family, or marital status in its programs, activities, or employment practices as required by Iowa Code §§ 216.6 and 216.9, Titles VI and VII of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d and 2000e), the Equal Pay Act of 1973 (29 U.S.C. § 206, et seq.), Title IX (Educational Amendments, 20 U.S.C. §§ 1681-1688), Section 504 (Rehabilitation Act of 1973, 29 U.S.C. § 794), and Title II of the Americans with Disabilities Act (42 U.S.C. § 12101, et seq.). Veteran status is also included to the extent covered by law. Any person alleging a violation of equity regulations shall have the right to file a formal complaint. Inquiries concerning application of this statement should be addressed to: John Clopton (Equity Coordinator and Title IX Coordinator for Employees) or Nancy Henderson (Title IX Coordinator for Students), Hawkeye Community College, 1501 East Orange Road, P.O. Box 8015, Waterloo, Iowa 50704-8015, telephone 319-296-4405, email: equity-titleIX@hawkeyecollege.edu, or the Director of the Office for Civil Rights, U.S. Department of Education, Citigroup Center, 500 W. Madison, Suite 1475, Chicago, IL 60661, phone number 312/730-1560, fax 312/730-1576.

DISCLAIMER

This syllabus is believed to be accurate at the time it was written. However, the instructor reserves the right to make changes as deemed necessary, provided notification is given to the students.

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