COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Welding Codes and Advanced Inspection
COURSE NUMBER	WELD 0280
DIVISION	Career and Technical Education
DEPARTMENT	WELD
CIP CODE	48.0508
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1 Lab: 6
PREREQUISITES	WELD 0100

COURSE DESCRIPTION
Through a variety of classroom and/or shop/lab learning and assessment activities, the students in this course will: learn destructive and nondestructive testing methods, how to interpret them to code, and how to use a code to set up welding procedures and qualification tests.

PROGRAM ALIGNMENT
This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:
https://kansasregents.org/workforce_development/program-alignment

PROGRAM LEARNING OUTCOMES

1. The student will be able to identify high risk areas that should be avoided by operators while automated machinery is running.
2. After completing the program, students will be able to exhibit a high-level of professionalism including appropriate dress, attendance, communication skills and other soft skills necessary
3. The student will be able to demonstrate the ability to successfully complete a welding project.

TEXTBOOKS
http://kckccbookstore.com/

METHOD OF INSTRUCTION
A variety of instructional methods may be used depending on content area. These include but are not limited to lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE

I. Inspection methods
   A. Destructive examination
      1. Weld bend tests
      2. Tensile tests
      3. Impact tests
      4. Fillet weld break tests
      5. Macros etch specimens
   B. Non-Destructive examination
      1. Visual inspection
      2. Magnetic particle testing
      3. Die penetrant testing
      4. Ultrasound inspection
      5. Radiographic inspection
II. Welding codes
   A. AWS
   B. ASME
   C. API
   D. SAE
III. Code testing
   A. Reading and writing a WPS
   B. Inspecting set up of weldment
   C. Inspecting welding during process
   D. Visual inspection of finished weldment
   E. Preparation of test specimens
   F. Testing of specimens

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

A. Explain how different testing methods ensure quality welds.
   1. Identify various testing methods used in industry
   2. Define whether various testing methods are destructive or nondestructive
   3. Describe what various testing methods check for and how it ensures quality welds

B. Define codes, organizations, and what industries they cover.
   4. Identify several commonly used welding codes
   5. Identify major code creating organizations and correctly match the codes they publish
   6. Identify industries that commonly use welding codes and match them to their code

C. Inspect welds to various codes.
   7. Define visual acceptance criteria to a given code
   8. Visually inspect groove welds to provided code and properly identify pass/fail status
   9. Visually inspect fillet welds to provided code and properly identify pass/fail status

D. Properly prepare test weldments for welding.
   10. Determine joint preparation and geometry for a weld test to a given code
   11. Prepare plates to have proper edge preparation for a given weld test
   12. Properly tack plates for test weldment

13. Inspect tacked test plates for proper fit up within given code

E. Properly prepare specimens for destructive testing.
   14. Determine proper layout for test specimens for given weld test
   15. Demonstrate ability to get proper test specimens for bend tests
   16. Demonstrate ability to get proper macro etch and break test specimens for fillet welds
   17. Demonstrate proper surface preparation for face and root bend tests
   18. Demonstrate proper surface preparation for macro etch test specimens

F. Test destructive test specimens and interpret results for pass/fail status to given codes.
   19. Demonstrate ability to perform root and face bend tests and inspections to given code
   20. Demonstrate ability to perform side bend tests and inspections to given code
   21. Demonstrate ability to perform fillet weld break tests and inspections to given code
   22. Demonstrate ability to perform macro etch weld tests and inspections to given code

G. Properly prepare test weldments for NDE.
   23. Determine what if any preparation must be done to prepare for MT
   24. Determine what if any preparation must be done to prepare for DPT
   25. Determine what if any preparation must be done to prepare for UT
   26. Determine what if any preparation must be done to prepare for RT

H. Use various NDE to determine welds are acceptable to various codes
   27. Demonstrate ability to perform and inspect welds with MT
   28. Demonstrate ability to perform and inspect welds with DPT
   29. Demonstrate ability to perform and inspect welds with UT
   30. Demonstrate ability to perform and inspect welds with RT

ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

COLLEGE POLICIES AND PROCEDURES

Student Handbook
https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf

College Catalog
https://www.kckcc.edu/academics/catalog/index.html

College Policies and Statements
https://www.kckcc.edu/about/policies-statements/index.html

Accessibility and Accommodations
https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html.