

## COURSE SYLLABUS

<b>LAST REVIEW</b>	Fall 2022
<b>COURSE TITLE</b>	Automated Welding and Cutting
<b>COURSE NUMBER</b>	WELD 0270
<b>DIVISION</b>	Career and Technical Education
<b>DEPARTMENT</b>	WELD
<b>CIP CODE</b>	48.0508
<b>CREDIT HOURS</b>	4
<b>CONTACT HOURS/WEEK</b>	Class: 1    Lab: 6
<b>PREREQUISITES</b>	WELD 0100

### COURSE DESCRIPTION

Through a variety of classroom and/or shop/lab learning and assessment activities, the students in this course will: learn set up and operation of various automated welding and cutting procedures including programming, weld settings, troubleshooting, and maintenance of equipment.

### 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](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://kckccbbookstore.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. Intro to automated welding and cutting
  - A. Safety
  - B. Basic G and M code
  - C. Overview of automated welding and cutting
- II. CNC cutting machine
  - A. Start up and basic maintenance
  - B. Making a part for a CNC cutting program
  - C. Nesting for CNC cutting machines
  - D. Transferring files to CNC cutting machine
  - E. Operating CNC cutting machine
  - F. Basic trouble shooting for CNC cutting machines
- III. Robotic welding
  - A. Start up and basic maintenance
  - B. Making a robotic welding program
  - C. Weld settings for robotic welders
  - D. Operating a robotic welder
  - E. Basic trouble shooting for robotic welders

### **COURSE LEARNING OUTCOMES AND COMPETENCIES**

Upon successful completion of this course, the student will:

- A. Explain safety concerns specific to automated welding and cutting.
  - 1. Define areas that should be avoided by operators while automated machinery is running.
  - 2. Define area that observers should avoid while automated machinery is running.
  - 3. Explain why automated safety systems are never to be overridden.
- B. Use basic G and M codes for automated systems.
  - 4. Define common G and M code commands.
  - 5. Fix errors with basic G and M code commands.
  - 6. Create a simple program from scratch using only G and M code.
- C. Start up and provide basic maintenance of CNC cutting machine.
  - 7. Demonstrate proper start up procedure for a CNC cutting machine.
  - 8. Locate places on CNC machine that require maintenance daily.
  - 9. Locate places on CNC machine that require maintenance on a weekly basis.
  - 10. Locate places on CNC machine that require maintenance monthly.
  - 11. Demonstrate proper consumable replacement for CNC machine.
- D. Program a CNC cutting machine to make various parts.
  - 12. Use shape library to create several common parts from sheet steel.
  - 13. Use a CAD or other program to create parts.
  - 14. Use nesting software to nest various parts onto a sheet.
  - 15. Download a part nest into a CNC machine and run program.
- E. Perform basic troubleshooting for CNC cutting machine.
  - 16. List several common causes of CNC machine errors.
  - 17. Successfully use a trouble shooting guide to fix common problems with CNC machine.
  - 18. Define problems that should be fixed by a trained maintenance technician.

- F. Start up and maintain robotic welding station.
  - 19. Demonstrate proper start up procedure for a robotic welder.
  - 20. Locate places on robotic welder that require maintenance daily.
  - 21. Locate places on robotic welder that require maintenance on a weekly basis.
  - 22. Locate places on robotic welder that require maintenance monthly.
  - 23. Demonstrate proper consumable replacement for robotic welder.
  
- G. Program a robotic welding station to make several welds.
  - 24. Define different commands used by teach pendant to program robotic welder.
  - 25. Define different types of robot movement and what they are used for.
  - 26. Demonstrate how to teach a point to robotic welder.
  - 27. Demonstrate how to teach and run a weld with a robotic welder.
  
- H. Provide basic troubleshooting for robotic welder.
  - 28. List several common causes of robotic welder errors.
  - 29. Successfully use trouble shooting guide to fix common problems with robotic welder.
  - 30. Define problems that should be fixed by a trained maintenance technician.

### **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>.