NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS

COURSE IDENTIFICATION

Course Code/Number: ETEC 163

Course Title: Welding Procedures & Applications

Division: [x] Applied Science (AS) [ ] Liberal Arts (LA) [ ] Workforce Development (WD)
[ ] Health Care (HC) [ ] Lifetime Learning (LL) [ ] Nursing [ ] Developmental

Credit Hour(s): Seven (7)

Effective Date: FA 2014

Assessment Goal Per Outcome: 70%

COURSE DESCRIPTION

This course is designed to provide training for students who want to acquire job entry welding skills. Safety procedures care and use of equipment, knowledge of welding symbols, and the study and application of welding theories and procedures are emphasized. Instruction will be provided in the fundamentals of shielded metal arc welding, gas tungsten arc welding, gas metal arc welding and the fundamentals of oxyacetylene cutting.

MINIMUM REQUIREMENTS/PREREQUISITES AND/OR COREQUISITES

None

TEXTS

The official list of textbooks and materials for this course is found on *my*Neosho.

http://www.neosho.edu/ProspectiveStudents/Registration/CourseSyllabi.aspx

GENERAL EDUCATION OUTCOMES

1. Practice Responsible Citizenship through:
   - identifying rights and responsibilities of citizenship,
   - identifying how human values and perceptions affect and are affected by social diversity,
   - identifying and interpreting artistic expression.
2. Live a healthy lifestyle (physical, intellectual, social) through:
   - listing factors associated with a healthy lifestyle and lifetime fitness,
   - identifying the importance of lifetime learning,
   - demonstrating self-discipline, respect for others, and the ability to work collaboratively as a team.
3. Communicate effectively through:
   - developing effective written communication skills,
   - developing effective oral communication and listening skills.
4. Think analytically through:
   - utilizing quantitative information in problem solving,
   - utilizing the principles of systematic inquiry,
   - utilizing various information resources including technology for research and data collection.

COURSE OUTCOMES/COMPETENCIES (as Required)

Upon successful completion of this course, the student will be able to:

1. Describe the Fundamentals of Welding

   a. Describe fusion welding, resistance welding, filler rods, and electrodes
   b. Compare the oxyfuel and arc welding processes and compare the SMAW, GMAW, and the GTAW processes.
   c. Describe and sketch the following kinds of joints—butt, lap, tee, corner, and edge.
   d. Describe the following kinds of welds—groove, fillet, plug, slot, spot, and seam.
   e. Name and locate the parts of a weld.
   f. Discuss basic considerations in joint design and fitup.

2. Demonstrate Welding Safety

   a. Explain the importance of good housekeeping in an area where welding is taking place.
   b. List at least three precautions to take to avoid fires and explosions when welding.
   c. Describe two methods of protecting yourself against the fumes and gases associated with welding.
   d. Describe the personal protective equipment required when welding.
   e. Explain the precautions to take when using and handling cylinders and regulators.

3. Discuss Oxyfuel Welding Equipment

   a. Briefly describe the oxyfuel welding process and the components of an oxyfuel outfit, including the lighting device.

b. Discuss safety precautions and personal protective gear required for working with oxyfuel equipment.
c. List the steps involved in preparing to weld.
d. Compare the neutral, carburizing, and oxidizing flames.
e. List the steps in safely shutting down an oxyfuel welding system.

4. Arc Welding

a. List similarities and dissimilarities between oxyfuel welding and arc welding.
b. Describe the electric welding circuit, including choices of AC or DC, DC polarity, and power sources.
c. Discuss welding machine ratings in terms of amperage and duty cycle and describe features and uses of transformer, generator, rectifier, and inverter welding machines.
d. Discuss welding cable considerations and describe the electrodes and electrode holders used for SMAW, GMAW, and GTAW processes.
e. Discuss the personal safety gear and precautions necessary for arc welding and explain how arc welding accessories are used.

5. Demonstrate Welding Techniques

a. Explain what considerations affect the selection of a welding process.
b. Describe the four welding positions.
c. Explain why overhead welds are difficult to make and tell how to make them.
d. Describe the preparation required for oxyfuel welding, SMAW, GMAW, and GTAW processes.
e. Describe the procedures involved in oxyfuel welding, SMAW, GMAW, and GTAW processes.

6. Describe How to Avoid Weld Faults

a. Describe the effects of electrode selection, current, arc length, and travel speed on arc welding procedures.
b. Describe common causes of arc blow, a hard-to-start arc, and spatter, and explain why proper fitup is important.
c. Define the terms overlap, undercut, blowhole, and inclusion and explain the causes of each.
d. Explain how expansion and contraction can be controlled when welding.
e. Name and describe the various tests used to identify metals.

7. Identify Welding Symbols

a. Identify which side of a structure a weld is to be made from.
b. Identify the kind of chamfer to be cut on a joint to be welded, and which part is to be chamfered.
c. State the required dimensions of a weld.
d. Identify the contour required on a finished weld.
e. State how a weld contour is to be finished.

f. Differentiate between welds that are to be made at the site of final assembly and welds that are to be made before the parts are shipped to the site.

MINIMUM COURSE CONTENT

The following topics must be included in this course. Additional topics may also be included.

I. Fundamentals of Welding
II. Welding Safety
III. Oxyfuel Welding Equipment
IV. Arc Welding Equipment
V. Welding Techniques
VI. Avoiding Weld Faults
VII. Welding Symbols

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

INSTRUCTIONAL METHODS
Lecture, demonstrations, films and specific reading assignments.

METHOD OF EVALUATION
1. To read and complete all assignments given, including all tests, written or pipe coupons.
2. The student will be required to clean the equipment and shop area.
3. Evaluation will be determined by attitude, class participation, test scores and class assignments.
4. Written tests
5. Welding tests

GRADING SCALE
The final grade will be based on the cumulative total points converted to a letter grade on the following scale:

90% - A
80% - B
70% - C
60% - D

ASSESSMENT OF STUDENT GAIN

The purpose of assessing student learning at Neosho County Community College is to ensure the educational purposes of the institution are met and appropriate changes are made in program development and classroom instruction to allow for student success. The instructor(s) of this course will determine the methods of assessment most appropriate and complete an assessment report at the end of the course.

Pre-assessment ideally begins during the advisement and enrollment process prior to the beginning of the course where the advisor and student determine through the interview process the level of placement for the student. During the period of the first two weeks of a normal semester, each student will be observed and/or interviewed and initial papers produced will be examined to determine needed competency development throughout the course. Post-assessment to determine gain in competency will be measured at the end of each unit of study.

Attendance Policy

1. NCCC values interactive learning which promotes student engagement in the learning process. To be actively engaged, the student must be present in the learning environment.

2. Unless students are participating in a school activity or are excused by the instructor, they are expected to attend class. If a student's absences exceed one-eighth of the total course duration, (which equates to one hundred (100) minutes per credit hour in a face-to-face class) the instructor has the right, but is not required, to withdraw a student from the course. Once the student has been dropped for excessive absences, the registrar's office will send a letter to the student, stating that he or she has been dropped. A student may petition the chief academic officer for reinstatement by submitting a letter stating valid reasons for the absences within one week of the registrar's notification. If the student is reinstated into the class, the instructor and the registrar will be notified. Please refer to the Student Handbook/Academic Policies for more information

3. Absences that occur due to students participating in official college activities are excused except in those cases where outside bodies, such as the State Board of Nursing, have requirements for minimum class minutes for each student. Students who are excused will be given reasonable opportunity to make up any missed work or receive substitute assignments from the instructor and should not be penalized for the absence. Proper procedure should be followed in notifying faculty in advance of the student's planned participation in the event. Ultimately it is the student's responsibility to notify the instructor in advance of the planned absence.

ACADEMIC INTEGRITY

NCCC expects every student to demonstrate ethical behavior with regard to academic pursuits. Academic integrity in coursework is a specific requirement. Definitions, examples, and possible consequences for violations of Academic Integrity, as well as the appeals process, can be found in the College Catalog, Student Handbook, and/or Code of Student Conduct and Discipline.

ELECTRONIC DEVICE POLICY

Student cell phones and other personal electronic devices not being used for class activities must not be accessed during class times unless the instructor chooses to waive this policy.

NOTE

Information and statements in this document are subject to change at the discretion of NCCC. Students will be notified of changes and where to find the most current approved documents.

ACCOMMODATIONS

If you are a student with a disability who may need accommodation(s), in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, please notify the Dean of Student Services in the Student Services Office, Sanders Hall, 620-432-0304, on the Chanute Campus, or the Dean for the Ottawa and Online Campuses, 785-248-2798, on the Ottawa Campus as soon as possible. You will need to bring your documentation for review in order to determine reasonable accommodations, and then we can assist you in arranging any necessary accommodations.

NON-DISCRIMINATION POLICY

The following link provides information related to the non-discrimination policy of NCCC, including persons with disabilities. Students are urged to review this policy.

http://www.neosho.edu/Departments/NonDiscrimination.aspx

SEXUAL MISCONDUCT POLICY (TITLE IX)

At NCCC, it is the responsibility of an instructor to help create a safe learning environment in the classroom, including both physical and virtual classrooms. All instructors are considered mandatory reporters at NCCC, therefore any information regarding sexual misconduct that is shared by a student in one-on-one meetings with the instructor must be reported to appropriate personnel at the College. Instructors will keep the information private to the greatest extent possible, but it is not confidential. Generally, climate surveys, classroom writing assignments or discussions, human subjects research, or events such as Take Back the Night events do not provide notice that must be reported to the Coordinator by employees, unless the reporting party clearly indicates that they wish a report to be made.

The following link provides information related to the sexual misconduct policy of NCCC, including resources, reporting options, and student rights. Students are urged to review this policy.

http://www.neosho.edu/TitleIX.aspx

COURSE NOTES