Miami Dade College

GENERAL INFORMATION	
Course Prefix/Number: ETI 1805C	Course Title: Introduction to Rigging and Lifting
Number of Credits: 3	
Degree Type	☐ B.A. ☐ B.S. ☐ B.A.S ☐ A.A. ☒ A.S. ☐ A.A.S. ☐ C.C.C. ☐ A.T.C. ☐ V.C.C
Date Submitted: 11-01-2007	Effective Year/Term: 2007-2
☒ New Course Competency ☐ Revised Course Competency	
Course to be designated as a General Education course (part of the 36 hours of A.A. Gen. Ed. coursework): ☐ Yes ☐ No	

The above course links to the following General Education Outcomes:

☒ Communication	☐ Social Responsibility
☒ Numbers / Data	☐ Ethical Issues
☒ Critical thinking	☐ Computer / Technology Usage
☐ Information Literacy	☐ Aesthetic / Creative Activities
☐ Cultural / Global Perspective	☐ Environmental Responsibility

Course Description (limit to 50 words or less, **must correspond with course description on Form 102**):

This course provides knowledge and skills required by students preparing for careers in industrial maintenance involving the mechanical maintenance of heavy equipment. Students learn how to determine rigging requirements for lifts, select equipment, calculate loads, and safely operate different types of lift equipment. Pre-requisites: ETI1701, ETI1870. Laboratory fee. A.S. degree credit only. (2 hr lecture; 2 hr lab)

Prerequisite(s): ETI1701, ETI1870	Corequisite(s):

Course Competencies:

Competency 1: The student will demonstrate an understanding of the general responsibilities and safety of a rigger in a power plant by:

1. Identifying the standards used that form the basis for the safe movement of loads.
2. Discussing the responsibilities of the rigger.
3. Explaining the importance of pre-job planning.
4. Discussing the need for the proper selection and use of rigging equipment.
5. Defining initial inspection, periodic inspection, and frequent inspection.
6. Explaining the purpose of the periodic inspection tag expiration date.
7. Stating the basis for removal from service criteria for rigging equipment.

Competency 2: The student will demonstrate an understanding of wire rope rigging hardware by:

1. Listing the components of a wire rope and stating the purpose of each component.
2. Defining the types of wire rope core and citing the advantages of each type.
3. Explaining the four common strand classifications in relation to wire rope.
4. Stating the basis for the standard arrangements of wire rope.
5. Defining initial inspection, periodic inspection, and frequent inspection.
6. Identifying the classifications of wire rope used in the construction of wire rope slings.
7. Naming the wire grades used in the manufacture of wire rope and listing the two grades used in the manufacture of wire rope slings.
9. Defining “lay” and “lay length” in relation to wire rope and explaining its importance to riggers.

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10. Defining abrasion in regards to wire rope and listing three causes of abrasion.
11. Identifying the wire rope sling most commonly used by riggers.
12. Using the tables provided for wire rope slings, differentiate the load capacities for vertical, choker, and basket hitches.
13. Explaining the D:d ratio and stating what happens when a wire rope goes around a pin of its own diameter.
14. Defining “sling stress”.
15. Stating the importance of accurately measuring sling angles when determining sling stress.
16. Determining sling stress using both the Sling Angle Method and the Sling Length – Vertical Height Method.

Competency 3: The student will demonstrate an understanding of hitches, eyebolts, hoist rings, and links as used in rigging and lifting by:

1. Explaining the loss of capacity for the different methods of using a choker hitch.
2. Stating the advantages and disadvantages of using a basket hitch.
3. Determining the correct size rigging hardware for a given application.
4. Identifying the types of eyebolts and explaining why the shouldered eyebolt is the only type recommended for use.
5. Explaining how eyebolts are measured and stating the vertical capabilities for given sizes.
6. Using the tables provided, stating the loss of capacity for eyebolts that receive a pull other than “in line”.
7. Determining the torque requirements for given safety hoist rings.
8. Explaining when the socket head cap screw for a safety hoist ring may be replaced.
9. Stating the importance of cleaning and inspecting threaded holes before installing eyebolts or safety hoist rings.
10. Discussing why the safety hoist ring must be used when rigging at angles of less than 45 degrees.
11. Identifying the basic components of chain and lever operated hoists.
12. Stating the markings that must be on a chain hoist in accordance with ASME B30.16.
13. Stating the inspection that should be performed on chain and lever hoists.
14. Performing a frequent inspection on a chain hoist in accordance with MMDI-8.
15. Preparing rigging chains and lever hoists for use.
16. Stating the purpose of using rings/links for hoisting.
17. Naming the types of rings/links.

Competency 4: The student will demonstrate an understanding of crane operations as used in rigging and lifting by:

1. Stating the function of the three basic components of a manually operated fixed crane.
2. Listing the operator qualification requirements for a manually operated fixed crane.
3. Performing crane operator’s “pre-operational” responsibilities.
4. Listing the three classifications of crane inspections.
5. Defining frequent inspections and periodic inspections as they relate to cranes.
6. Stating the location(s) of inspection information on a fixed crane.
7. Listing the general items to check when performing a frequent inspection in accordance with the placard/maintenance aide.
8. Stating the precautions to observe when performing an inspection.
9. Performing a pre-use crane inspection.

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10. Stating the reason for preventing “side pull”.
11. Performing a crane activity that includes bridge travel, trolley travel, hoist operation, and parking the crane.
12. Stating the function of the four basic components of a fixed crane.
13. Stating the function of the hoist “Limit Switch”.
14. Describing the frequent inspection requirements for an under hung hoist fixed crane.
15. Stating the purpose and characteristics of proper signaling related to cranes.
16. Recognizing and demonstrating the signals referenced in ASME, B30.2 and B30.5.
17. Identifying the required members of a lift team for a lift requiring use of a mobile crane.
18. Discussing the preplanning and safe work practices associated with making a lift using a mobile crane.

Competency 5: The student will demonstrate an understanding of jacks as used in rigging and lifting by:

1. Defining the term “jack”, “mechanical jack”, and “hydraulic jack”.
2. Stating the types of jack inspection.
3. Stating five of the safe operating practices used while performing jack operations.
4. Operating a mechanical or hydraulic jack in a rigging exercise.

Competency 6: The student will demonstrate an understanding of special lifting devices as used in rigging and lifting by:

1. Defining “special lifting device”.
2. Using ASME N14.6 to identify the following for special lifting devices: design safety factor, inspection criteria, inspection frequency.

Competency 7: The student will demonstrate an understanding of NUREG-0612 by:

1. Defining “heavy load” as it applies to NUREG-0612.
2. Listing the requirements to be met before making a NUREG-0612 lift.
3. Discussing the reason for having “safe load paths” when making a NUREG-0612 lift.
4. Describing the importance of the “safety factor” of rigging components when making a NUREG-0612 lift.
5. Stating the factors of common rigging components.