SAFETY IN MANUFACTURING
Course Syllabus

Course Number: AMTA-0241  |  OHLAP Credit: No
OCAS Code: None
Course Length: 30 Hours
Career Cluster: Manufacturing
Career Pathway: Maintenance, Installation & Repair
Career Major(s): Mechatronics Systems Technician

Pre-requisite(s):

Course Description: This course covers safety rules and regulations and precautions for electrical and mechanical hazards on the job, tool and equipment safety, first aid, CPR, blood borne pathogens, OSHA and NFPA mandated lockout/tagout, personal protective equipment, right to know, and confined space entry procedures.

Textbooks: Instructor developed materials

Course Objectives: A. Demonstrate Proper Procedures Related to Instrument and Control Safety
1. Discuss Lockout / Tagout
2. Explain the purpose for safety policies.
3. Explain the hazards associated with systems and equipment that operate at high temperatures and high pressures.
4. Demonstrate and explain basic techniques for working safely on or near systems.
5. Explain the basic hazards associated with pneumatic systems and how to minimize those hazards.

B. Demonstrate Proper Procedures Related to Fire Safety
1. Explain how fires start.
2. Describe the types of fire hazards present in many work places.
3. Explain the four basic classes of fires.
4. List and explain the basic steps to follow when reporting a fire emergency.
5. Identify the four elements of combustion.
6. Discuss types and locations of fire extinguishers.
7. Match types of fire extinguishers with a description of a fire.
8. Explain the basic characteristics of extinguishing agents.
9. Explain the basic techniques used for putting out or controlling fires using portable fire extinguisher.
10. Explain the hazards associated with certain types of fire extinguisher and extinguishing agents.
11. Explain some of the basic techniques for preventing workplace fires.
12. Describe the use and care of hose and hydrant systems.
13. Differentiate between sprinkler and deluge systems.
14. Explain the respiratory hazards resulting from the operation of carbon dioxide and halon systems.

C. Demonstrate Proper Procedures Related to Good Housekeeping
1. Explain the common sense rules of good housekeeping.
2. Practice good housekeeping skills in the shop and on the job.
3. Discuss “5S” system and its place in industry.

D. Demonstrate Proper Procedures Related to Personal Protection
1. Discuss the role of OSHA and the EPA.
2. Explain the need for proper clothing for a safe working environment.
3. Explain the need for wearing company-approved personal protection equipment.
4. Describe the basic protection provided by safety clothing and equipment.
5. Use personal safety equipment in the shop and on the job.

E. Demonstrate Proper Procedures Related to Material Handling
1. Discuss current laws concerning “Hazardous Waste management” as it relates to this industry.
2. Demonstrate proper lifting methods.
3. Describe a general procedure for planning a job that involves transporting materials.
4. Demonstrate safe lifting techniques.
5. Explain four general guidelines for using moving equipment.
6. Demonstrate proper material handling techniques.

F. Demonstrate Proper Procedures Related to Industrial Safety
1. Explain what a hazard is and give examples of hazards found in industrial facilities.
2. Identify two general causes of accidents and describe some general guidelines for handling accidents and unsafe conditions.
3. Explain the need for wearing company-approved personal protection equipment.
4. Describe the basic protection provided by safety clothing and equipment.
5. Demonstrate lock out/tag out procedures.

G. Locate Information in the MSDS
1. Locate “MSDS” in classroom/labs/workshop.
2. Identify parts and location of information on “MSDS”.
3. Match terms associated with hazardous materials with their correct definitions.
4. List five conditions that will cause a material to be considered hazardous.
5. Complete statements related to protecting your health.
6. Complete statements about what should be done in case of a leak or spill of hazardous materials.
7. Locate information found in the MSDS.
8. Discuss PH factors.

H. Overall Shop Safety
1. Complete the OSHA CareerSafe Program.
2. Complete an individual shop safety inspection.
3. Pass an overall safety test with 100% accuracy before working in shop.

I. Start Safe, Stay Safe
1. What is CareerSafe?
2. What is safety?
3. Why safety matters to you
4. Your legal rights
5. What is OSHA
6. The “StartSafe, StaySafe,” Philosophy
7. What it means to StartSafe
8. What it means to StaySafe

J. Preventing Falls
1. Why preventing falls matters
2. Why falls occur
3. Safety on elevated work surfaces
   a. Floor and wall openings
   b. Fixed industrial stairs
   c. Ladders
   d. Scaffolds
4. How to StartSafe and StaySafe to prevent falls

K. Personal Protective Equipment (PPE)
1. Why PPE matters
2. Eye and face protection
3. Head protection
4. Hearing protection
5. Hand protection
6. Foot protection
7. Respiratory protection
8. Full body protection
9. How to StartSafe and StaySafe

L. Bloodborne Pathogens
1. Understanding pathogens
2. Hazards of bloodborne pathogens
3. How bloodborne pathogens are transmitted
4. Who is at risk
5. Reducing your risk of exposure
6. OSHA requirements
7. How to StartSafe and StaySafe

M. Electrical Safety
1. Why electrical safety matters
2. How electricity works
3. The danger of electricity
4. Electrical safety
   a. Electrical safety devices
   b. Electrical safety procedures
5. How to StartSafe and StaySafe around electricity

N. Machine Guarding
1. Why machine guarding matters?
2. Types of mechanical hazards
3. Methods of machine guarding namely
   a. guards
   b. devices
   c. location or distance
O. Hazard Communication
1. Why chemical safety matters
2. Chemical safety overview
3. The “Right to Know” Law
4. HAZCOM Program
5. Material Safety Data Sheets
6. Warning labels
7. Employee training
8. How to StartSafe and StaySafe

P. Ergonomics
1. What is ergonomics?
2. Why ergonomics matters
3. Risk factors affecting ergonomics
4. Posture
5. Biomechanics
6. Lifting techniques
7. Applying ergonomics
8. How to StartSafe and StaySafe

Q. Preventing Workplace Violence
1. What is violence?
2. Who is at risk?
3. Prevention strategies
   a. Employer and employee involvement
   b. Warning signs
   c. Coping skills
4. How to StartSafe and StaySafe

R. Emergency Action
1. The importance of emergency planning.
2. General emergency preparedness.
3. What is an Emergency Action Plan (EAP)?
4. Emergency guidelines
   a. Tornados
   b. Earthquakes
   c. Hurricanes
   d. Fires
   e. Chemical Release
   f. Hostile Act
5. How to StartSafe and StaySafe

TTC objectives

Teaching Methods: The class will primarily be taught by the lecture and demonstration method and supported by various media materials to address various learning styles. There will be question and answer sessions over material covered in lecture and media presentations. Supervised lab time is provided for students to complete required projects.
### Grading Procedures:
1. Students are graded on theory and shop practice and performance.
2. Each course must be passed with seventy (70%) percent or better.
3. Grading scale: A=90-100%, B=80-89%, C=70-79%, D=60-69%, F=50-59%.

### Description of Classroom, Laboratories, and Equipment:
Tulsa Technology Center campuses are owned and operated by Tulsa Technology Center School District No. 18. All programs provide students the opportunity to work with professionally certified instructors in modern, well-equipped facilities.

### Available Certifications/College Credit
The student may be eligible to take state, national or industry exam after completion of the program. College credit may be issued from Oklahoma State University-Okmulgee or Tulsa Community College. See program counselor for additional information.

### College Credit Eligibility:
The student must maintain a grade point average of 2.0 or better.