



Approved Innovative Course

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Course: Occupational Safety & Environmental Technology I

PEIMS Code: N1303680

Abbreviation: OSET1

Grade Level(s): 9-12

Number of Credits: 1.0

Course description:

During Occupational Safety & Environmental Technology (OSET) I, students will investigate the field of Occupational Safety and Health Administration and Environmental Technology, which is charged with the tasks of ensuring that business and industry provide a safe workplace, free from hazards and bringing about a reduction in the occurrence of job related injuries and fatalities. Students will use safety resources and discover procedures for collaborating with business and industry regarding ways to increase employee safety and health, reduce workers' compensation insurance costs and medical expenses, decrease payout for return-to-work programs, reduce faulty products, and lower costs for job accommodations for injured workers.

The sequence of OSET courses provides students with the knowledge and skills to enter business and industry under OSET/OSHA. Students will be prepared to investigate hazards and create plans of action to address hazard controls for employers.

Essential knowledge and skills:

Occupational Safety and Environmental Technology (OSET) I – Workplace Safety & Health Management (One Credit).

- (a) **General Requirements.** Recommended prerequisite: Principles of Transportation Systems, Principles of Distribution and Logistics, or Principles of Manufacturing. This course is recommended for students in Grades 9-12.
- (b) **Introduction.**
 - (1) Career and technical education instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.
 - (2) The Manufacturing Career Cluster focuses on planning, managing, and performing the processing of materials into intermediate or final products and related



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professional and technical support activities such as production planning and control, maintenance, and manufacturing/process engineering.

- (3) Students investigate the field of Occupational Safety and Health Administration (OSHA), which is charged with the tasks of ensuring that businesses provide a safe workplace that is free from recognized hazards, promoting health and safety in the workplace, and reducing the occurrence of on the job injuries, illnesses, and fatalities. Students will use safety resources and discover procedures for collaborating with business and industry regarding ways to increase employee safety and health.
 - (4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.
 - (5) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.
- (c) Knowledge and skills.
- (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:
 - (A) identify career development and entrepreneurship opportunities in occupational safety and environmental technology;
 - (B) identify careers in occupational safety and environmental technology;
 - (C) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in occupational safety and environmental technology;
 - (D) discuss certification opportunities;
 - (E) identify employers' expectations, appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and
 - (F) explore career goals, objectives, and strategies as part of a plan for future career opportunities.
 - (2) The student understands the legal responsibilities of work safety in a hazardous work environment. The student is expected to:
 - (A) apply critical thinking and event analysis from a legal or liability standpoint to make workplace safety decisions inside and outside the classroom;
 - (B) research safety information and convey findings to others;
 - (C) estimate the direct cost of work-related hazard on employees; and
 - (D) investigate the indirect cost of work-related hazards on employers.
 - (3) The student identifies hazardous substances that lead to injury and illness on the job. The student is expected to:



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- (A) identifies various hazardous substances that are found in workplace settings;
 - (B) determine short- or long-term cost effects of exposure to hazardous substances; and
 - (C) differentiate between health issues caused by workplace factors and those health issues arising from pre-existing condition(s).
- (4) The student describes the process of adopting safety measures. The student is expected to:
- (A) explain the importance of controlling workplace hazards at the source whenever possible;
 - (B) develop training programs and promote understanding of health and safety guidelines in the employment setting by improving workplace health and safety program and safety awareness; and
 - (C) recommend safety accessories such as safety glasses, face shields, aprons, and gloves as appropriate.
- (5) The student understands the role of a health and safety representative. In a simulated inspection environment, the student is expected to:
- (A) communicate professionally by
 - (i) adapting language for audience, purpose, situation, and intent;
 - (ii) organizing oral and written information;
 - (iii) interpreting and communicating information, data, and observations;
 - (iv) delivering formal and informal presentations;
 - (v) applying active listening skills;
 - (vi) developing and interpreting tables, charts, and figures;
 - (vii) listening to and speaking with diverse individuals; and
 - (viii) exhibiting public relations skills;
 - (B) conduct surveys and inquiries that lead to plans of action;
 - (C) discuss the processes for reporting a hazard to appropriate parties such as union, supervisor, or advisory committee;
 - (D) examine the relationship between self, community, environment, and consequences of actions; and
 - (E) develop safety and wellness guidelines to improve workplace safety and health program/awareness.
- (6) The student describes the scope of the science of ergonomics. The student is expected to:
- (A) define ergonomics;
 - (B) summarize the history of the science of ergonomics;
 - (C) describe three organizational domains of ergonomics; and



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- (D) apply the science of ergonomics across other fields.
- (7) The student identifies ergonomic problems in a variety of workplace settings. The student is expected to:
- (A) evaluate potential issues related to posture in a workplace setting;
 - (B) apply OSHA's Video Display Terminal (VDT) checklist to a workplace setting; and
 - (C) evaluate elements of a user-friendly computer station.
- (8) The student relates body systems to the study of ergonomics. The student is expected to:
- (A) describe primary body systems analyzed in the study of ergonomics;
 - (B) demonstrate the mechanism of muscular contraction;
 - (C) explain energy transformation for muscular activity;
 - (D) explain the functions of the musculoskeletal system; and
 - (E) describe muscular fatigue, strength, innervation, and reflexive movements.
- (9) The student identifies workplace conditions that lead to types of work-related musculoskeletal disorders (WMSDs). The student is expected to:
- (A) analyze the two classifications, type A and type B, of occupational work;
 - (B) evaluate conditions that can occur due to fatigue in work; and
 - (C) describe in biological terms the fatigue conditions associated with static work
 - (D) compare work-related musculoskeletal disorders (WMSDs) and explain the three stages of WMSDs; and
 - (E) classify occupational factors and risk symptoms for WMSDs.
 - (F) .
- (10) The student applies principles of prevention to work-related musculoskeletal disorders. The student is expected to:
- (A) describe principles of arrangement that ensure a functional workplace; and
 - (B) describe environmental factors such as tools and equipment, working conditions, and possible safety hazards.



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- (11) The student explains the fundamentals of using professional and regulatory resources. The student is expected to:
- (A) analyze landmark regulatory actions responsible for enforcing public safety;
 - (B) compare four types of product liability classifications from a legal perspective;
 - (C) determine the necessary components of a warning label or signage for a physically intensive job;
 - (D) revise an ergonomic workplace design based on OSHA recommendations; and
 - (E) evaluate professional and regulatory resources such as state and federal laws and rules, safety plans, and emergency plans.
- (12) The student designs workspaces to reduce work related risks. The student is expected to:
- (A) describe personal risk factors that are important in providing training recommendations and administrative controls for WMSDs;
 - (B) propose multiple design solutions with attention to factors such as sophistication, cost, and time to implementation; and
 - (C) produce workplace safety design solutions including immediate, interim, and long-term solutions.
- (13) The student explores successful safety management. The student is expected to:
- (A) examine and evaluate management involvement in ensuring a safe working environment for all employees;
 - (B) identify the responsibilities of management, safety and health professionals, first-line supervisor, and worker regarding safety management; and
 - (C) explain management and supervisory accountability regarding workplace safety.
- (14) The student develops an understanding of elements of a written safety and health program. The student is expected to:
- (A) explain the necessity of a comprehensive safety program;
 - (B) describe the requirements and elements of OSHA guidelines for a safety and health program; and



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- (C) conduct and revise emergency and medical plans through mock emergency and medical drills.
- (15) The student evaluates methods to reduce sources of workplace hazards in order to promote a safe working environment. The student is expected to:
- (A) describe hazard identification steps including inventory, work site inspection, review of the potential dangers associated with various materials and chemicals found in workplaces;
 - (B) perform a root cause analysis and describe the methods associated with the analysis;
 - (C) identify accident types such as those caused by human error, preventable, and life-threatening; and
 - (D) describe the elements of a workplace health program.
- (16) The student demonstrates knowledge of workplace security and violence. The student is expected to:
- (A) describe strategies to enhance workplace security and prevent workplace violence;
 - (B) outline hazard prevention and control;
 - (C) discuss training and education components of a safety program; and
 - (D) identify and discuss types of workplace violence events and prevention strategies.

Description of specific student needs this course is designed to meet:

This course addresses a special need in business and industry for highly skilled and trained employees who can manage and oversee health and safety concerns in a variety of employment settings in today's work environment. Students will learn about all aspects of health and safety in the workplace, including but not limited to, providing employee training for safety purposes; understanding the human element involved in safety; demonstrating an understanding of controlling hazardous materials; and employing proper investigative techniques when work related accidents occur. OSET I meets the needs of students entering the workplace under the umbrella of Occupational Safety and Environmental Technology.

Major resources and materials:

Textbooks, instructional materials, and an on-site computer lab will be provided for this course/program.



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Oakley, Jeffrey S. *Accident Investigation Techniques*. American Society of Safety Engineers, 2012.

Reese, Charles D. *Occupational Health and Safety Management: A Practical Approach*. CRC Press, 2016.

Suggested methods for evaluating student outcomes:

Measures of success will be determined from daily participation, class work, projects and exams.

Teacher qualifications:

Secondary Industrial Arts: Grades 6-12

Secondary Industrial Technology: Grades 6-12

Technology Education: Grades 6-12

Trade and Industrial Education: Grades 6-12 with appropriate work approval as identified on the certificate

Trade and Industrial Education: Grades 8-12 with appropriate work approval as identified on the certificate

Vocational Trades and Industry. This assignment requires appropriate work approval.

Additional information: