

Implementation Date
Fall 2010

PROGRAM CONCENTRATION: Architecture, Construction,
Communication, Transportation
CAREER PATHWAY: Marine Engine Technology
COURSE TITLE: Marine Structures and Transportation
Repair (MST)

This course introduces students to the basic concepts of fiberglass and trailer repair. Mastery of these standards through project-based learning and leadership development activities of Skills USA will help prepare students with a competitive edge for the transportation logistics marketplace as well as prepare for jobs that require fiberglass repair skills.

Fiberglass Repair

ACCT-MST-1. Students will understand how to prepare a boat for proper fiberglass repair. Students will:

- a. Prepare surfaces to be repaired using grinding and proper cutting techniques.
- b. Evaluate the application of fiberglass products.
- c. Describe the cause, prevention, and repair of delamination of fiberglass
- d. Describe the cause, prevention, and repair of gel coat blisters.
- e. Examine the proper allocation of hull top coats, ablative paints, anti-fouling and below waterline applications for salt and fresh water.
- f. Demonstrate the use of gel coat to finish a repair project.

Academic Standards:

MM1-4P1 Students will solve problems using appropriate technology. The student:

- a. *Solve problems that arise in mathematics and in other contexts.*
- b. *Apply and adapt a variety of appropriate strategies to solve problems.*

SC5 Students will understand that the rate at which a chemical reaction occurs can be affected by changing concentration, temperature, or pressure and the addition of a catalyst. The student:

- a. *Demonstrate the effects of changing concentration, temperature, and pressure on chemical reactions*

SCSh2 Students will use standard safety practices for all classroom laboratories and field investigations.

- a. *Follow correct procedures for use of scientific apparatus.*
- b. *Demonstrate appropriate techniques in all laboratory situations.*
- c. *Follow correct protocol for identifying and reporting safety problems and violations.*

Implementation Date
Fall 2010

Implementation Date

Fall 2010

Trailer Repair

ACCT-MST-2. Students will understand how to repair a boat trailer to satisfactory condition. Students will:

- a. Remove and repair trailer wiring to working condition using proper connectors, etc.
- b. Remove trailer brakes, master cylinder and other brake items, inspect and repair to working condition
- c. Remove wheel bearings, seals, tires and other related parts and inspect and repair to working condition.
- d. Check for cracks and damage on trailer frame and related parts. Weld and repair damage and repair winches and straps as required to satisfactory condition.
- e. Sand, prime and re-paint trailer to satisfactory condition.
- f. Bleed master cylinder, align trailer and axels, and adjust brake system to satisfactory condition.

Academic Standards:

SPS7 Students will relate transformations and flow of energy within a system.

- a. *Identify energy transformations within a system (e.g. lighting of a match).*

SPS10 Students will investigate the properties of electricity and magnetism. The student:

- b. *Explain the flow of electrons in terms of: alternating and direct current, the relationship among voltage, resistance and current, simple series and parallel circuits.*

SCSh4 Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials

- a. *Develop and use systematic procedures for recording and organizing information.*
- b. *Use technology to produce tables and graphs.*
- c. *Use technology to develop, test, and revise experimental or mathematical models.*

ACCT- MST-3. Students will understand how to service, inspect, repair and replace deck and hull hardware and rigging on watercraft. Students will:

- a. Remove and replace deck hardware, using proper procedures, fasteners, sealants and tools.
- b. Inspect, replace, and properly adjust rigging on watercraft.
- c. Inspect and service corrosion protection hardware.
- d. Inspect, service, and install thru-hulls, sea cocks and hull fittings.

Implementation Date
Fall 2010

Academic Standards:

MM1-4P1 Students will solve problems using appropriate technology. Students will:

- c. Solve problems that arise in mathematics and in other contexts.*
- d. Apply and adapt a variety of appropriate strategies to solve problems.*

SPS10 Students will investigate the properties of electricity and magnetism. The student:

- b. Explain the flow of electrons in terms of alternating and direct current, the relationship among voltage, resistance and current, simple series and parallel circuits.*

Reading Across the Curriculum

Reading Standard Comment

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

- a. Reading in all curriculum areas
 - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
 - Read both informational and fictional texts in a variety of genres and modes of discourse.

Implementation Date
Fall 2010

- Read technical texts related to various subject areas.
- b. Discussing books
 - Discuss messages and themes from books in all subject areas.
 - Respond to a variety of texts in multiple modes of discourse.
 - Relate messages and themes from one subject area to messages and themes in another area.
 - Evaluate the merit of texts in every subject discipline.
 - Examine author's purpose in writing.
 - Recognize the features of disciplinary texts.
- c. Building vocabulary knowledge
 - Demonstrate an understanding of contextual vocabulary in various subjects.
 - Use content vocabulary in writing and speaking.
 - Explore understanding of new words found in subject area texts.
- d. Establishing context
 - Explore life experiences related to subject area content.
 - Discuss in both writing and speaking how certain words are subject area related.
 - Determine strategies for finding content and contextual meaning for unknown words.

CTAE Foundation Skills

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.

CTAE-FS-1 Technical Skills: Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.

CTAE-FS-2 Academic Foundations: Learners achieve state academic

Implementation Date
Fall 2010

standards at or above grade level.

CTAE-FS-3 Communications: Learners use various communication skills in expressing and interpreting information.

CTAE-FS-4 Problem Solving and Critical Thinking: Learners define and solve problems, and use problem-solving and improvement methods and tools.

CTAE-FS-5 Information Technology Applications: Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.

CTAE-FS-6 Systems: Learners understand a variety of organizational structures and functions.

CTAE-FS-7 Safety, Health and Environment: Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.

CTAE-FS-8 Leadership and Teamwork: Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.

CTAE-FS-9 Ethics and Legal Responsibilities: Learners commit to work ethics, behavior, and legal responsibilities in the workplace.

CTAE-FS-10 Career Development: Learners plan and manage academic-career plans and employment relations.

CTAE-FS-11 Entrepreneurship: Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.