

PROGRAM CONCENTRATION: Architectural, Construction,
Communication, and Transportation
CAREER PATHWAY: Maritime Studies
COURSE TITLE: Fundamentals of Maritime Studies

Course Description: This course introduces students to basic principles and skills associated with the Maritime Industry, its function in U.S., world and local history, commerce, basic terminology/nomenclature. Topics to include: seamanship, navigation, safety, terminal operations, stevedoring, logistics, engineering, port security, and the economic connection between the port and the global economy. To make the connection between the classroom and the maritime industry substantial, tours of the local port, Coast Guard and other maritime industries should be arranged. Mastery of standards through project-based learning, technical skills practice, and leadership development activities or the Career Technical Student Organization will provide students with a competitive edge for entry into government/military services, the global market and/or post-secondary education.

ACCT-FMS-1. Acquire an understanding of the maritime transportation system. Students will:

- a. Define terms related to the maritime transportation system, including system users, Federal, State and Local Governments, private industry, waterways, ports, intermodal connections, vessels, vehicles, marketplace, stakeholders, and logistics.
- b. Examine the components of the maritime transportation system in terms of waterways, ports, intermodal connections, vessels, vehicles, and system users.
- c. Evaluate the importance of stakeholder cooperation to maintain the health of the maritime transportation system.
- d. Assess the relationship of the local maritime transportation system between the marketplace and local, national and international economy.

Academic Standards:

ELA9RC3: The student acquires new vocabulary in each content area and uses it correctly.

- a. *Demonstrates an understanding of contextual vocabulary in various subjects.*
- b. *Uses content vocabulary in writing and speaking.*

ELA9W3: The student uses research and technology to support writing.

- a. *Formulates clear research questions and utilizes appropriate research venues (i.e., library, electronic media, personal interview, survey) to locate and incorporate evidence from primary and secondary sources.*
- b. *Uses supporting evidence from multiple sources to develop the main ideas within the body of an essay, composition, or technical document.*

ScSh6: Students will communicate scientific investigations and information clearly.

- b. *Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.*
- c. *Use data as evidence to support scientific arguments and claims in written or oral presentations.*

ScSh9: Students will enhance reading in all curriculum areas by:

- a. *Read technical texts related to various subject areas.*

ACCT-FMS-2. Analyze the history that influenced the maritime industry and the growth of free trade. Students will:

- a. Describe critical historical events that contributed to the development of the United States Maritime Industry.
- b. Identify the role of the United States Merchant Marine in aid of the National Defense.
- c. Outline the origins of the maritime industry worldwide and the impact on free trade.
- d. Examine the global economic impact of the United States shipyards and shipbuilding.
- e. Examine the global economic role of the United States Merchant Marine.
- f. Evaluate Georgia's contribution in the development of the United States Maritime role.

Academic Standards:

ELA9LSV1: The student participates in student-to-teacher, student-to-student, and group verbal interactions. The student

- a. *Initiates new topics and responds to adult-initiated topics.*

ScSh8: Students will understand important features of the process of scientific inquiry.

- d. *Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes weighed.*

ACCT-FMS-3. Demonstrate an understanding of basic seamanship in the maritime industry. Students will:

- a. Identify the importance of proper and safe use of ground tackle to include at a minimum: types of anchors, cables/ropes/chains, types of shackles, windlass, bits, chock, etc.
- b. Demonstrate knot tying, splicing, and marlinspike as used in the maritime industry.
- c. Examine proper ship handling techniques in anchoring and docking to include momentum, inertia, pivot point, and controllable and uncontrollable forces.
- d. Describe the importance of OSHA standards in cargo handling.
- e. Examine the basic principles of marine weather formation and movement.
- f. Create written observations of local weather conditions to observe frontal and non-frontal systems and create vessel log entries.

Academic Standards:

MM1P1: Students will solve problems using appropriate technology.

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

MM1P3: Students will communicate mathematically.

- a. *Organize and consolidate their mathematical thinking through communication.*

MM1P4: Students will make connections among mathematical ideas and to other disciplines.

- a. *Recognize and use connections among mathematical ideas.*
- b. *Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- c. *Recognize and apply mathematics in contexts outside of mathematics.*

MM1P5: Students will represent mathematics in multiple ways.

- a. *Create and use representations to organize, record, and communicate mathematical ideas.*
- b. *Select, apply, and translate among mathematical representations to solve problems.*

SM3: Students will explore the science of weather forecasting.

- a. *Analyze a surface weather map.*
- b. *Predict weather for a specific location using knowledge of air mass, frontal, and cyclone movement.*
- c. *Investigate and describe the formation of severe weather including severe thunderstorms, hurricane, tornadoes, and their role in energy transfer.*
- d. *Describe the role of technological advancements on weather forecasting and relate that to the improvement of weather watch/warning issuance.*

SO3: Students will analyze how weather and climate are influenced by the oceans.

- d. *Explain the relationships between climate change, the greenhouse effect, and the consequences of global warming on the ocean.*

ACCT-FMS-4. Develop an understanding of the basic components of marine engineering, including design, construction, installation, operation and support of the systems and equipment which propel and control marine vehicles, and of the systems which make a vehicle or structure habitable for crew, passengers and cargo. Students will:

- a. Outline significant developments in marine engineering related to the design, construction, installation and operation to include stability, compartmentalization, electrical, machines, valves, and piping.
- b. Examine the types of systems and equipment which propel and control marine vehicles. Create a model that classifies the systems which make a ship habitable for personnel in terms of lighting, circulation, refrigeration, sanitation, food services, safety, and other ancillary equipment.

Academic Standards:

ELA9W1: The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals closure.

- f. Uses traditional structures for conveying information (i.e., chronological order, cause and effect, similarity and difference, and posing and answering a question).*

ScSh1: Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- a. Exhibit the above traits in their own scientific activities.*
- b. Recognize that different explanations often can be given for the same evidence.*

ACCT-FMS-5. Become aware of maritime essentials that include nautical terms, types of communication, navigation rules, shipboard equipment, and plotting. Students will:

- a. Identify vocabulary specific to the maritime industry, including ship nomenclature, nautical terms, and radio terminology.
- b. Match communication equipment with its proper use, including voice tubes, VHF radio, single-sideband radio, EPIRB (Emergency Position Indicating Radio Beacon), and the Global Maritime Distress and Safety System (GMDSS).
- c. Recognize navigation rules to include steering and sailing rules, lights and shapes, sound and light signals, and exemptions.
- d. Classify common vessel equipment and determine proper use of the magnetic compass, gyrocompass, radar, depth finder, helm, life saving equipment, fire fighting equipment, anchor, fenders, etc.
- e. Discuss the importance of navigation as well as ways in which a position can be created and generate a plotting fix.
- f. Explain the relationship between the variables of speed, time, and distance.

Academic Standards:

ELA9W1: The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals closure.

- a. Establishes a clear, distinctive, and coherent thesis or perspective and maintains a consistent tone and focus throughout.*
- c. Constructs arguable topic sentences, when applicable, to guide unified paragraphs.*

MM1G1: Students will investigate properties of geometric figures in the coordinate plane.

- a. Determine the distance between two points.*

MM1G3: Students will understand and use the language of mathematical argument and justification (specifically from part (a) inductive and deductive reasoning).

- a. Determine the sum of interior and exterior angles in a polygon.*

ScSh9: Students will enhance reading in all curriculum areas by:

- a. Read technical texts related to various subject areas.*

ACCT-FMS-6. Acquire knowledge to identify types of vessels, their purpose, and function. Students will:

- a. Classify types of vessels by purpose and function to include the following: LNG/LPG, tankers, container, U.S. Naval Ships/submarines, Passenger vessels, Dry-bulk, Ro/Ro, Pilot boats, heavy lift, tugboats, offshore supply vessels, Float-on/float-off, push boat, ferries, research vessels, luxury yachts, barges, fishing vessels, Coast Guard cutters, and fire boats.

Academic Standards:

ELA9W1: The student produces writing that establishes an appropriate organizational structure, sets a context and engages the reader, maintains a coherent focus throughout, and signals closure.

- e. Writes texts of a length appropriate to address the topic or tell the story.*

ACCT-FMS-7. Investigate terminal operations and port security as well as the importance of each as it relates to the maritime industry. Students will:

- a. Describe the logistics network and its association to supply chains, distribution of cargo, intermodal transportation, stevedoring, and vessel agents.
- b. Compare and contrast terminal operations by type and function to include bulk terminals, break bulk terminals, liquid bulk terminals, Liquefied Natural Gas (LNG) terminals, container terminals, passenger terminals.
- c. Examine Homeland Security and the correlation to Coast Guard, Customs and Border Protection, terminal security, port security, Port Police, and local law enforcement.

Academic Standards:

ScSh1: Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.

- a. Exhibit the above traits in their own scientific activities.*

ACCT-FMS-8. Investigate maritime safety and emergency practices and equipment. Students will:

- a. Relate OSHA standards to vessel and dockside safety.
- b. Determine the importance of following all vessel safety rules.
- c. Compare and contrast various types of safety equipment by function and purpose to include: life vests, life boats, life rafts, life rings, EPIRB, fire extinguishers, firefighting gear, fixed firefighting equipment, hazardous chemical exposure gear, and hearing and eye protection.

- d. Describe the safety procedures for rotating machinery, radar exposure, confined space entry, securing for sea, hazardous chemical exposure and disposal.
- e. Outline proper emergency procedures for man overboard, taking on water, abandon ship, and fire on board.

Academic Standards:

ScSh2: Students will use safety standard practices for all classroom laboratory and field investigations.

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

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.
 - 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 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.