Marine Service Technology II

8751 36 weeks / 280 hours

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Acknowledgments

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Course Description

Suggested Grade Level: 11 or 12  
Prerequisites: 8750

This course completes students’ introduction to service and repair of watercraft and marina operations. Students gain entry-level marine trade skills in areas including inboard and outboard systems, carpentry, fiberglass construction and repair, electricity, welding, vessel storage/handling, and tools and equipment operation. The course is based on the National Marine Trades Curriculum, developed by the American Boat and Yacht Council (ABYC).

As noted in Superintendent’s Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials Table

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

<table>
<thead>
<tr>
<th>Task Number</th>
<th>8751</th>
<th>Tasks/Competencies</th>
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<tbody>
<tr>
<td>Understanding the Fundamentals of Boat Design and Construction</td>
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<tr>
<td>39 ⊕</td>
<td>Explain basic techniques used in boat building.</td>
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<td>Demonstrating Woodworking Skills</td>
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<td>40</td>
<td>Produce a wooden boat component of various types of marine wood, using hand tools.</td>
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<tr>
<td>44</td>
<td>Create a small fiberglass part.</td>
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<tr>
<td>45</td>
<td>Perform detailing functions.</td>
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<tr>
<td>46</td>
<td>Repair fiberglass and gel coat.</td>
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### Maintaining and Repairing Inboard and Inboard/Outboard Engine Systems

<table>
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<tr>
<td>47</td>
<td>Remove and install a propeller on an inboard and inboard-outboard engine, inspecting the hub for damage and following procedures that adhere to engine manufacturer's recognized practices and procedures.</td>
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<tr>
<td>48</td>
<td>Perform seasonal maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.</td>
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### Maintaining and Repairing Outboard Engine Systems

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<tr>
<td>52</td>
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### Understanding Marine Systems

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### Practicing Safe Vessel Transportation on Land

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<td>Describe the techniques to transfer a boat from a trailer to stands.</td>
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Legend: ☒ Essential ☐ Non-essential ☐ Omitted

Curriculum Framework

Understanding the Fundamentals of Boat Design and Construction

Task Number 39

Explain basic techniques used in boat building.

Definition

Explanation should include the following:

- the distinction between production and custom-built boats
- fabrication equipment, procedures, materials, and quality control
- construction methods for a variety of boat types.
Process/Skill Questions

- What are the advantages of using the following hull types in boat construction: round, flat, V-hull, cathedral (tri-hull)?
- What are the disadvantages of using the following hull types in boat construction: round, flat, V-hull, cathedral (tri-hull)?
- What is the relationship between a vessel's waterline length and its hull speed?

American Boat and Yacht Council (ABYC) Standards

H-5 Boat Load Capacity

H-8.1 Buoyancy in the Event of Swamping, Purpose

H-8.2 Buoyancy in the Event of Swamping, Scope

H-8.3 Buoyancy in the Event of Swamping, Referenced Organizations

H-8.4 Buoyancy in the Event of Swamping, Definitions

H-8.5 Buoyancy in the Event of Swamping, Requirements - In General

S-8 Boat Measurement and Weight

Demonstrating Woodworking Skills

Task Number 40

Produce a wooden boat component of various types of marine wood, using hand tools.

Definition

Demonstration should incorporate the use of hand tools, to include brace and bit, hand planer, hand saws, chisels, files, clamps, and sanders.

Process/Skill Questions
• Hand planing end grain is best done with which of the following: low angle block plane, butt end plane, jack plane, bench plane? Why?
• Why must caution be used while chipping bungs with a chisel?
• What issue is not a concern when sharpening blades on a bench stone? Why?
• What are five separate clamp types? When is each used and why?
• How long should a glued project remain clamped? Why?

Task Number 41

Produce a wooden boat component of various types of marine wood, using pneumatic and electric hand tools.

Definition

Demonstration should incorporate pneumatic and electric power hand tools, to include circular saw, drills, grinders, jigsaw, power sanders, hand power planer, reciprocating saw, hole saw, and router.

Process/Skill Questions

• Which of the following would likely be used to drill a 3/4" hole in wood: round chisel or gouge, high speed twist bit, hole saw, or spade bit? Why?
• How does the material being used dictate bit selection?
• A high speed, tapered, twist bit with counter bore prepares the work for which one or more of the following: a flat wood screw and bung, a round head wood screw and bung, any fastener of similar size?
• Safety is paramount while using power equipment. What are three general rules that apply to all such equipment? Why is each rule important?

Task Number 42

Produce a wooden boat component of various types of marine wood, using pneumatic and electric power tools.

Definition

Demonstration should incorporate pneumatic and electric power tools that include a band saw, table saw, planer, jointer, compound mitre saw, and drill press.
Process/Skill Questions

- Increasing the surface area of a glue joint has what effect(s) on the joint's strength? Why?
- When gluing wood with resorcinol, what should the clamp pressure be: moderate to heavy, moderate to light, very light, or very heavy? Why?
- When gluing wood with epoxy, what should the clamp pressure be: moderate to heavy, moderate to light, very light, or very heavy? Why?

Task Number 43

Manipulate wood to create a variety of joints and shapes using the appropriate marine woodworking techniques and adhesives.

Definition

Manipulation should incorporate marine woodworking techniques that include creating a scarf joint, laminating, bending, and patterning.

Process/Skill Questions

- What is the length to thickness ratio for a scarf joint? Why is it important to adhere to this ratio?
- Which of the following four techniques is not a method for curving wood: weights for time release of tension, steaming and bending, cutting a curve, gluing and laminating? Why?
- What role does grain play in woodworking?

Performing Fiberglass Construction and Repair

Task Number 44

Create a small fiberglass part.
Definition

Performance should include preparing a mold for lay-up, mixing resin to proper ratio, mixing filler powders for intended use, applying resins for intended use, cutting fiberglass without damage to gel coat surfaces, and working in a safe and clean manner.

Process/Skill Questions

- What considerations are important in setting up a mold for a fiberglass part?
- What is the location of information on proper mixing ratio (resin to catalyst)? Why is it important to follow this ratio?
- What safety precautions are suggested when mixing and applying fillers and resins?

American Boat and Yacht Council (ABYC) Standards

H-27 Seacocks, Thru-Hull Connections, and Drain Plugs

H-3.6 Windows, Windshields, Exterior Hatches, Doors, Port Lights, and Glazing Materials, Glazing

T-19 Fabrication Equipment, Procedures, and Materials Quality Control

Task Number 45

Perform detailing functions.

Definition

Performance should include first buffing out gel coat, then buffing and polishing finish to remove defects, as required.

Process/Skill Questions

- When detailing gel coats, what are the considerations for selecting pads and compounds?
- What defects are commonly removed by buffing?
- What is the difference between buffing and polishing?

American Boat and Yacht Council (ABYC) Standards

T-19 Fabrication Equipment, Procedures, and Materials Quality Control
Task Number 46

**Repair fiberglass and gel coat.**

**Definition**

Performance should include preparing surface and repairing damaged fiberglass, using either vinylester or epoxy resin and gel coats.

**Process/Skill Questions**

- What is the importance of analyzing and planning the repair?
- What are the basic steps in preparing a surface for repair?
- What is the importance of a backer when using an epoxy resin filler material?

**American Boat and Yacht Council (ABYC) Standards**

H-27 Seacocks, Thru-Hull Connections, and Drain Plugs

T-19 Fabrication Equipment, Procedures, and Materials Quality Control

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**Maintaining and Repairing Inboard and Inboard/Outboard Engine Systems**

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Task Number 47

**Remove and install a propeller on an inboard and inboard-outboard engine, inspecting the hub for damage and following procedures that adhere to engine manufacturer's recognized practices and procedures.**

**Definition**

Removal and installation should reflect an understanding of the relationship among pitch, diameter, cavitation, ventilation, and blade configuration. It should also include inspecting the hub for damage and ensuring that a cotter pin secures the propeller nut.
Process/Skill Questions

- What varying procedures may be needed to remove and install a propeller on different outboard motor systems?
- What varying procedures may be needed to remove and install a propeller on different inboard/outboard motor systems?
- What is the relationship among pitch, diameter, cavitation, ventilation, and blade configuration?

American Boat and Yacht Council (ABYC) Standards

P-4 Marine Inboard Engines and Transmissions

P-6 Propeller Shafting Systems

Task Number 48

Perform seasonal maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.

Definition

Maintenance should include electrical, cooling, ignition, fuel, power trim, stern drive, engine controls/rigging, inboard drive system, and lubricating tasks.

Process/Skill Questions

- What maintenance is required during summer months? During storage months?
- Why is seasonal maintenance so important, particularly in colder climates?
- What are the steps in winterizing inboard and inboard/outboard engine systems?

American Boat and Yacht Council (ABYC) Standards

A-14.4 Gasoline and Propane Gas Detection Systems, Definitions

E-10 Storage Batteries

E-11 AC and DC Electrical Systems on Boats

P-14 Propulsion Control Systems
Task Number 49

Perform routine maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.

Definition

Routine maintenance should include electrical, cooling, ignition, fuel, power trim, stern drive, engine controls/rigging, inboard drive system, and lubricating tasks.

Process/Skill Questions

- What is the correct procedure to replace alternators and related electrical components?
- What are the appropriate tools to use when diagnosing electrical/electronic system failures?
- Why is engine alignment important in routine maintenance?

American Boat and Yacht Council (ABYC) Standards

A-14.4 Gasoline and Propane Gas Detection Systems, Definitions

E-10 Storage Batteries

E-11 AC and DC Electrical Systems on Boats

P-14 Propulsion Control Systems

P-17.8 Steering Systems for Outboard, Inboard, Sterndrive, and Water Jet Drive Boats, Requirements - Boat Steering System Testing

Task Number 50

Perform seasonal maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.

Definition

Performance should include electrical, cooling, ignition, fuel, power trim, stern drive, engine controls/rigging, inboard drive system, and lubricating tasks.

Process/Skill Questions

- What are the procedures for replacing the water-separating fuel filter? Why is replacement important?
- What are procedures for checking the battery? What are the possible results of improper or inadequate battery maintenance?
- What are procedures for checking the electrical system? Why is regular maintenance of the electrical system essential?

American Boat and Yacht Council (ABYC) Standards

E-10 Storage Batteries

E-11.5 AC and DC Electrical Systems on Boats, Requirements

E-11.6 AC and DC Electrical Systems on Boats, System Voltage

H-33 Diesel Fuel Systems

P-14 Propulsion Control Systems


P-24.1 Electric/Electronic Propulsion Control Systems, Purpose

P-24.2 Electric/Electronic Propulsion Control Systems, Scope
Task Number 51

Perform routine maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.

Definition

Maintenance should include electrical, cooling, ignition, fuel, power trim, stern drive, engine controls/rigging, inboard drive system, and lubricating tasks.

Process/Skill Questions

- What are the procedures for replacing the regular fuel filters? Why is this replacement important?
- What are the procedures for changing oil and oil filters? Why are these procedures important?
- What is the procedure for checking a propeller for possible damage?

American Boat and Yacht Council (ABYC) Standards

E-10 Storage Batteries

E-11.5 AC and DC Electrical Systems on Boats, Requirements

E-11.6 AC and DC Electrical Systems on Boats, System Voltage

H-33 Diesel Fuel Systems

P-14 Propulsion Control Systems


P-24.1 Electric/Electronic Propulsion Control Systems, Purpose
Maintaining and Repairing Outboard Engine Systems

Task Number 52

Remove and install a propeller on an outboard engine, inspecting the hub for damage and using procedures that adhere to engine manufacturer's recognized practices and procedures.

Definition

Demonstration should reflect an understanding of the relationship among pitch, diameter, cavitation, ventilation, and blade configuration. It should also include ensuring that a cotter pin secures the propeller nut.

Process/Skill Questions

- What should you look for when you inspect for damage of an outboard propeller?
- What are the advantages of a power trim system?
- What are the differences among cast, aluminum, and stainless steel propellers?

American Boat and Yacht Council (ABYC) Standards

P-4 Marine Inboard Engines and Transmissions
Task Number 53

Perform seasonal maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.

Definition

Maintenance should include electrical, cooling, ignition, fuel (scavenging), power trim, gear cases, and engine controls/rigging tasks.

Process/Skill Questions

- What maintenance is required during summer months? During storage months?
- Why is seasonal maintenance so important, particularly in colder climates?
- What are the steps in winterizing outboard engine systems?

American Boat and Yacht Council (ABYC) Standards

A-14.4 Gasoline and Propane Gas Detection Systems, Definitions

E-10 Storage Batteries

E-11 AC and DC Electrical Systems on Boats

P-14 Propulsion Control Systems

P-17.8 Steering Systems for Outboard, Inboard, Sterndrive, and Water Jet Drive Boats, Requirements - Boat Steering System Testing


P-4.8 Marine Inboard Engines and Transmissions, Instruction or Owner's Manual

P-4.9 Marine Inboard Engines and Transmissions, Identification Labels

Task Number 54
Perform routine maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.

Definition

Performance should include electrical, cooling, ignition, fuel (scavenging), power trim, gear cases, and engine controls/rigging tasks.

Process/Skill Questions

- What is the procedure for replacing the carburetor fuel inlet filter?
- What is the procedure for lubricating throttle and shift linkage pivot points?
- What is the procedure for inspecting and replacing oil in the lower unit?

American Boat and Yacht Council (ABYC) Standards

A-14.4 Gasoline and Propane Gas Detection Systems, Definitions

E-10 Storage Batteries

E-11 AC and DC Electrical Systems on Boats

P-14 Propulsion Control Systems

P-17.8 Steering Systems for Outboard, Inboard, Sterndrive, and Water Jet Drive Boats, Requirements - Boat Steering System Testing

P-21 Manual Hydraulic Steering Systems

P-4.8 Marine Inboard Engines and Transmissions, Instruction or Owner's Manual

P-4.9 Marine Inboard Engines and Transmissions, Identification Labels

Understanding Marine Systems

Task Number 55
Construct a simple electrical circuit for a bilge pump, running lights, or horn.

Definition

Construction should result in a circuit that is correctly designed, operational, and safe.

Process/Skill Questions

- What is a bilge pump? How and where is it used?
- How is a simple electrical circuit constructed for a bilge pump?
- What is the difference between the construction of an electrical circuit for running lights and for a horn? Why?

American Boat and Yacht Council (ABYC) Standards

A-16 Electric Navigation Lights

E-11 AC and DC Electrical Systems on Boats

H-22 Electrical Bilge Pump Systems

Practicing Safe Vessel Transportation on Land

Task Number 56

Describe the techniques to transfer a boat from a trailer to stands.

Definition

Description should include proper placement of jack stands and supports.

Process/Skill Questions

- How can a boat be safely transferred from a trailer to support stands?
- Where should the stands be placed on a boat for storage? Why is this placement important?
- Keel supports should be placed in no less than how many points? Why?

American Boat and Yacht Council (ABYC) Standards

Ty-28 Boat Lifting and Storage

Task Number 57

Troubleshoot and maintain a boat trailer and trailer lights.

Definition

Troubleshooting and maintaining should include inspecting hitches, safety chains, electrical connections, tires, and brakes.

Process/Skill Questions

- When is the best time to inspect boat trailer lights and brakes? Why?
- What is the procedure to troubleshoot short circuits, broken wires, bad connections, and bad bulbs?
- On a four-wire trailer system, what are the colors of the wires? What is the function of each colored wire?
- What is the most common cause of corrosion for trailer brakes?

American Boat and Yacht Council (ABYC) Standards

E-11 AC and DC Electrical Systems on Boats, Table XV, Engine and Accessory Wiring Color Code

E-16.2 AC and DC Electrical Systems on Boats, System Wiring, Wiring Identification

E-16.3 AC and DC Electrical Systems on Boats, System Wiring, Wiring Terminals

Task Number 58

Identify means other than a trailer for moving vessels over ground and the advantages and disadvantages of each.
Definition

Identification should include equipment for transporting such as a forklift, travel lift, hydraulic trailer, and marine railway.

Process/Skill Questions

- What are the advantages and disadvantages of a yard forklift?
- What are the advantages and disadvantages of a travel lift?
- What are the advantages and disadvantages of a hydraulic trailer?
- In what situations are marine railways generally used? Why?

American Boat and Yacht Council (ABYC) Standards

Ty-28 Boat Lifting and Storage

Performing Marina Operations and Yard Services

Task Number 59

Perform bottom preparation and painting, following paint manufacturer's recommendations.

Definition

Performance should include preparing and taping a water line, then painting a boat bottom, all according to best industry practice.

Process/Skill Questions

- What two ways are most commonly used to prepare the bottom for painting? Why?
- What type of paint is used to paint the bottom? Why?
- What type of application tool is used to apply bottom paint? Why?

American Boat and Yacht Council (ABYC) Standards

E-2 Cathodic Protection
Demonstrating Metalworking Skills

Task Number 60

Create a weld for various metals.

Definition

Weld should be for metals such as steel and aluminum and should exhibit the following characteristics:

- Meets American Welding Society (AWS) standards of quality and safety
- Has the correct "bead" in relation to heat, wire, speed, and hand movement
- Reflects proper techniques with SMAW (stick), GMAW (wire), and TIG welder.

Process/Skill Questions

- An MIG welder uses what type of wire/rod? Why?
- What is the purpose of the setting(s) on the front of a welder? Do settings need to be changed before beginning a weld? Why, or why not?
- What is the difference between MIG welding and TIG welding?
- Why is it better to use a spool gun instead of a regular MIG machine when welding aluminum?
- Why should a person wear a welding hood when looking at an arc from the welder?
- Which of the following terms--seam, joint, bead--is used to describe the weld produced during welding? To what do the other two terms refer?

American Boat and Yacht Council (ABYC) Standards

T-1 Aluminum Applications for Boats and Yachts

Task Number 61

Cut pieces of steel and aluminum.
Definition

Cuts should be made using a variety of tools (e.g., plasma torch, metal cutoff saw, circular saw, and oxyacetylene torches and grinders) and should meet American Welding Society (AWS) standards of quality and safety.

Process/Skill Questions

- When using oxyacetylene torches, what are the steps that are involved in properly lighting the torches? Why is each step important?
- How does a plasma cutter work? How is it different from oxyacetylene torches?
- What advantages are gained by using a carbide cutting blade rather than an abrasive cutting blade?
- What are safety rules to follow when performing cutting operations?

American Boat and Yacht Council (ABYC) Standards

T-1 Aluminum Applications for Boats and Yachts

Preparing for a Career

Task Number 62

Prepare a resume.

Definition

Preparation should include gathering personal information, selecting an organizational structure, tailoring the resume to the particular job, arranging and editing content, seeking permission before citing references, formatting, and proofreading.

Process/Skill Questions

- What types of information are important on a resume for the marine industry?
- If you have little or no work experience, how can you use school, volunteer, and other non-work experience to develop a successful resume?
- What are the legal considerations in preparing a resume?

Task Number 63
Prepare job-related correspondence.

**Definition**

Correspondence should include letters for the purposes of job inquiry, job application, and post-interview thank you.

**Process/Skill Questions**

- Why is it important to include a letter with a job application?
- How is the job application letter different from the resume?
- Are emails (in place of traditional mail) sufficient for job inquiry and thank you letters? Why or why not?
- What should a post-interview thank you letter include? Why is this letter important?

**Task Number 64**

**Complete a job application.**

**Definition**

Completing the application includes ensuring that information is correct and complete and that the application is neatly printed in ink or typed.

**Process/Skill Questions**

- Why is completeness important in a job application?
- What may be the results if a job application contains false or misleading information?
- Why is neatness important in a job application?

**Task Number 65**

**Complete the interview process.**

**Definition**

Completing the interview process includes preparation (e.g., researching the company, anticipating and preparing answers to questions, wearing appropriate clothing), staging of a mock interview, and follow-up.

**Process/Skill Questions**

- How can a job applicant prepare for an interview?
• What roles does verbal communication play in a job interview?
• What roles does nonverbal communication play in a job interview?

Task Number 66

Describe the procedure for resigning from a job.

Definition

Procedure includes talking with one’s supervisor, giving appropriate notice prior to leaving, following all procedures required by human resources, and leaving one’s workstation neat and ready for one’s successor.

Process/Skill Questions

• Why is it important to talk with one’s supervisor before telling anyone else about one’s decision to resign from a job?
• Why is it important to give proper notice and follow all procedures required by human resources when resigning from a job?
• Why is it important to leave one’s workstation neat and ready for one’s successor?

Task Number 67

Maintain/enhance job skills through continuing education and other professional development opportunities.

Definition

Maintaining and enhancing job skills includes taking courses, completing short-term training, earning certifications and other credentials, participating in professional associations, and keeping up with the field through trade literature and shows.

Process/Skill Questions

• Why is continuing education important in the marine service technology field?
• What types of continuing education opportunities are available in the marine industry?
• What types of certifications and other credentials exist in the marine industry? To what degree is each useful to an entry-level employee? To a seasoned employee?

SOL Correlation by Task
<table>
<thead>
<tr>
<th>Explain basic techniques used in boat building.</th>
<th>English: 11.5, 12.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Produce a wooden boat component of various types of marine wood, using hand tools.</td>
<td></td>
</tr>
<tr>
<td>Produce a wooden boat component of various types of marine wood, using pneumatic and electric hand tools.</td>
<td></td>
</tr>
<tr>
<td>Produce a wooden boat component of various types of marine wood, using pneumatic and electric power tools.</td>
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</tr>
<tr>
<td>Manipulate wood to create a variety of joints and shapes using the appropriate marine woodworking techniques and adhesives.</td>
<td></td>
</tr>
<tr>
<td>Create a small fiberglass part.</td>
<td></td>
</tr>
<tr>
<td>Perform detailing functions.</td>
<td></td>
</tr>
<tr>
<td>Repair fiberglass and gel coat.</td>
<td></td>
</tr>
<tr>
<td>Remove and install a propeller on an inboard and inboard-outboard engine, inspecting the hub for damage and following procedures that adhere to engine manufacturer's recognized practices and procedures.</td>
<td></td>
</tr>
<tr>
<td>Perform seasonal maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Perform routine maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Perform seasonal maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Perform routine maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices, using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Remove and install a propeller on an outboard engine, inspecting the hub for damage and using procedures that adhere to engine manufacturer's recognized practices and procedures.</td>
<td></td>
</tr>
<tr>
<td>Perform seasonal maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Perform routine maintenance on a gasoline-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.</td>
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<td>Perform seasonal maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.</td>
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<tr>
<td>Perform routine maintenance on a diesel-fueled engine, according to engine manufacturer's recognized procedures and practices and using appropriate testing equipment.</td>
<td></td>
</tr>
<tr>
<td>Construct a simple electrical circuit for a bilge pump, running lights, or horn.</td>
<td></td>
</tr>
<tr>
<td>Describe the techniques to transfer a boat from a trailer to stands.</td>
<td>English: 11.5, 12.5</td>
</tr>
<tr>
<td>Troubleshoot and maintain a boat trailer and trailer lights.</td>
<td></td>
</tr>
<tr>
<td>Identify means other than a trailer for moving vessels over ground and the advantages and disadvantages of each.</td>
<td></td>
</tr>
<tr>
<td>Perform bottom preparation and painting, following paint manufacturer's recommendations.</td>
<td></td>
</tr>
</tbody>
</table>
Create a weld for various metals.
Cut pieces of steel and aluminum.
Prepare a resume.  
Prepare job-related correspondence.  
Complete a job application.  
Complete the interview process.  
Describe the procedure for resigning from a job.  
Maintain/enhance job skills through continuing education and other professional development opportunities.

<table>
<thead>
<tr>
<th>Task</th>
<th>Language Levels</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Cut pieces of steel and aluminum.</td>
<td></td>
</tr>
<tr>
<td>Prepare a resume.</td>
<td>English: 11.6, 11.7, 12.6, 12.7</td>
</tr>
<tr>
<td>Prepare job-related correspondence.</td>
<td>English: 11.6, 11.7, 12.6, 12.7</td>
</tr>
<tr>
<td>Complete a job application.</td>
<td>English: 11.6, 11.7, 12.6, 12.7</td>
</tr>
<tr>
<td>Complete the interview process.</td>
<td>English: 11.1, 12.1</td>
</tr>
<tr>
<td>Describe the procedure for resigning from a job.</td>
<td>English: 11.5, 12.5</td>
</tr>
<tr>
<td>Maintain/enhance job skills through continuing education and other professional development opportunities.</td>
<td></td>
</tr>
</tbody>
</table>

**American Boat and Yacht Council (ABYC) Information**

The Marine Services framework is based on the *National Marine Trades Curriculum*, developed by the American Boat and Yacht Council (ABYC). Successful completers are entitled to receive a certificate of recognition from the ABYC. Teachers are encouraged to make arrangements by contacting the ABYC at:

American Boat and Yacht Council  
613 Third Street, Suite 10  
Annapolis, MD 21403  
Phone: (410) 990-4460  
Fax: (410) 990-4466  
[http://www.abycinc.org/contact.cfm](http://www.abycinc.org/contact.cfm)  
info@abycinc.org

**Entrepreneurship Infusion Units**

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.”
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- College and Work Readiness Assessment (CWRA+)
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- Marine Service Technician (Inland and Coastal-Core) Assessment
- Marine Service Technology Examination
- National Career Readiness Certificate Assessment
- Professional Communications Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Marine Service Technology I (8750/36 weeks, 140 hours)

Career Cluster: Transportation, Distribution and Logistics

<table>
<thead>
<tr>
<th>Pathway</th>
<th>Occupations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility and Mobile Equipment</td>
<td>Marine Watercraft Repair and Maintenance Worker</td>
</tr>
<tr>
<td></td>
<td>Motorboat Mechanic</td>
</tr>
<tr>
<td>Equipment Maintenance</td>
<td>Service Technician</td>
</tr>
<tr>
<td></td>
<td>Small Engine Mechanic</td>
</tr>
<tr>
<td>Transportation Operations</td>
<td>Motorboat Operator</td>
</tr>
<tr>
<td></td>
<td>Ship Engineer</td>
</tr>
</tbody>
</table>