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# APPENDIX A

## WORK PROCESS SCHEDULE

### ON-THE-JOB TRAINING OUTLINE

### RELATED INSTRUCTION OUTLINE

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**Appendix A**  
**WORK PROCESS SCHEDULE**  
**Marine Service Technician**  
**O\*NET-SOC CODE: 49-9042.00    RAPIDS CODE: 0946**

This schedule is attached to and a part of these Standards for the above identified occupation.

**APPRENTICESHIP APPROACH**

Time-based                       Competency-based                       Hybrid

**TERM OF APPRENTICESHIP**

The term of the apprenticeship is 3 years with an OJL attainment of 6000 hours, supplemented by the minimum required 450 hours of related instruction.

**RATIO OF APPRENTICES TO JOURNEYWORKERS**

The apprentice to journey worker ratio is: 1 Apprentice(s) to 1 journey worker(s).

**APPRENTICE WAGE SCHEDULE**

**PROBATIONARY PERIOD**

Every applicant selected for apprenticeship will serve a probationary period of 90 days.



## SELECTION PROCEDURES

The sponsor has adopted the following selection procedures, consistent with the requirements set forth in 29 CFR § 30.10(b):

- A. Employer posts available jobs on the ApprenticeshipNH website, New Hampshire Works Job Match System, other web-based job search engines such as Indeed.com and notifies recognized pre-apprenticeship organizations of current openings.
- B. The Community College System of New Hampshire, under the State Apprenticeship Expansion 2020 grant and Apprenticeship State Expansion grant, provides an information session(s) to discuss the registered apprenticeship program, the expectations, and the training provided for the selected occupation.
- C. Names of candidates who attend the information session are forwarded to MacCallum's Boathouse, Inc. and the attendees are all encouraged to apply by completing an application with MacCallum's Boathouse, Inc..
- D. Prior to the interview, each applicant will be given the option to review the Apprenticeship Standards and will be provided information about the program. If the applicant has any additional questions on the qualifications or needs additional information, it will be provided by the sponsor.
- E. The Sponsor will schedule interviews based upon hiring needs. The most qualified applicants who meet or exceed the minimum requirements will be contacted to participate in a phone interview with the HR Manager where the HR Manager will ask a standard set of questions.
- F. Qualified candidates are then invited to an in-person interview with the hiring manager.
- G. Applicants who do not meet the minimum qualifications and are not selected, will receive an email notifying them they were not selected for an interview.
- H. Applications of candidates who do not meet the minimum requirements are stored in a secure location for five years.
- I. Applicants who successfully complete a pre-apprenticeship program recognized by MacCallum's Boathouse, Inc. will be invited to an interview with the hiring manager.
- J. During the interview, the interviewer will ask standardized questions to be answered by candidates. Non- standard questions will also be asked if the conversation progresses in a specific interest.
- K. Candidate responses are kept by written record along with notes by the interviewer.
- L. Interview notes are kept on file along with the application for five years.



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- M. After the interview is conducted, the interviewer will meet with the General Manager to review applicant's answers, application, and notes. Based on these results, the Interviewer and General manager will decide who to hire.
  - N. Candidates who meet these criteria will be notified of a formal offer of employment contingent upon passing a pre-employment physical. Candidates will have up to five days after an offer is made to accept the position.
  - O. Candidates who are not being hired for the apprenticeship will be notified within two weeks from their last interview.
  - P. Hired apprentices will be required to pass a pre-employment physical and attend onboarding orientation which includes but is not limited to, a review of the company handbook, review of employee benefits and safety training.



## Appendix A

### ON-THE-JOB TRAINING OUTLINE

#### MARINE SERVICE TECHNICIAN

**O\*NET-SOC CODE: 49-9042.00 RAPIDS CODE: 0946**

**Occupational Description:** Repairs and maintains boats and similar vessels in marines service facility. Examines repair or installation orders, drawings, and vessel, utilizing knowledge based on past experience to determine extent of repairs required or modifications necessary for installation of equipment, accessories, and hardware. Consults with supervisor regarding installation or repair problems, sequence of operations and time required to complete repair or installations. Removes vessels from water, using movable lift crane or marine railway. Positions and secures blocking at bottom and sides of vessels according to size, weight, and weight distribution of vessel, using fasteners, hand tools, and power tools. Removes flaked paint, barnacles, and encrusted debris from hulls of vessel, using scrapers, scrubbers, power washers, and sandblast equipment. Ability to use power and hand tools including but not limited to all special software tools required by the industry, traditional socket/wrench, ratchet, measuring equipment, tolerance tools, and testing equipment as well as tool driven by air pneumatics, battery, 120 and 220v, sander and buffing wheel for fiberglass finishes. Tests engine, transmission, rigging, propeller, navigational, and related systems to diagnose malfunctions, using various measuring instruments. Replaces or repairs defected components or fabricates new components. Installs and tests steering gear, sanitation and refrigeration systems, cabinetry, electrical systems and accessories, hardware, trim, and related components, following manufacturer's instructions and drawings.

#### Work Process Schedule:

#### Approximate Hours:

- |  |      |
|--|------|
| 1. Introduction to workplace culture and expectations  | 200  |
| 2. Introduction to general marine technology and safety  | 600  |
| 3. Maintain and inspect gasoline engines; trouble-shoot and repair minor mechanical problems.  | 1100 |
| 4. Install watercraft electrical systems, trouble-shoot and repair electrical issues including navigational equipment and accessories. | 1000 |
| 5. Repair wooden components, restore and repair fiberglass for recreational watercrafts.   | 600  |
| 6. Repair and maintain recreational watercraft running gear, including shaft, strut, and propeller.                                    | 500  |
| 7. Repair and maintain steering, throttle, remote fuel and water systems.  | 700  |
| 8. Estimate cost of repairs for retail customer  | 500  |



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9. Practice customer relations for retail customer	<b>500</b>
10. Practice rules and regulations of maritime laws of New Hampshire waterways	<b>300</b>
<b>Total Hours</b>	<b>6000</b>



**Appendix A**  
**RELATED INSTRUCTION OUTLINE**  
**MARINE SERVICE TECHNICIAN**  
**O\*NET/SOC CODE: 49-9042 RAPIDS CODE: 0946**

<b>Class Number</b>	<b>Class Name</b>	<b>Credits</b>	<b>Hrs/Wk Class</b>	<b>Hrs/Wk Lab</b>	<b>Total Hours</b>
MAR121L	Marine Maintenance and Fundamentals	5	4	3	105
MAR127L	Marine Electrical Systems	5	3	6	135
MAR126L	Outboard Engine Maintenance	5	3	6	135
ESNT120L	College Essentials	1	1	0	15
MAR227L	Marine Drive Systems Diagnostics and Repair	5	3	6	135
MAR228L	Inboard Engine Diagnostics and Repair	5	3	6	135
MAR232L	Outboard Engine Diagnostics and Repair	5	3	6	135
<b>TOTAL MINIMUM HOURS</b>					<b>795</b>

**Course Curriculum Outline or Course Descriptions:**

**MAR121L Marine Maintenance and Fundamentals**

This course provides basic theoretical and foundational principles of two and four cycle engines along with development of common maintenance procedures specific to trailers and marine power packages. Emphasis on basic service operations including safety, use of hand and power tools, marine hardware, service literature, and operating principles of marine power packages. Students will also obtain credit within the Mercury University system.

**Course Outcomes**

1. Perform preventative maintenance of marine engines including oil changes, tune-ups, lower unit fluid change, water pump impeller replacement and fuel filter maintenance.
2. Execute basic marine engine winterizing techniques such as fogging engines, preserving fuel systems and draining engine cooling systems.



3. Complete a boat trailer inspection including the service of the trailer wheel bearings and adjustment of rollers and bunks to fit the boat hull.
4. Identify American Boat and Yacht Council safety standards related to marine fuel and electrical systems.
5. Resource service procedures and execute the process as published by the engine manufacture.

**MAR127L****Marine Electrical Systems**

This course focuses on theory, principles and measurements of AC and DC electricity and electronics are covered. Setup, maintenance and diagnostic procedures for common inboard, stern drive, outboard starting and charging systems. Schematic and conventional wiring diagram interpretation allows the student to become familiar with common 12-volt marine electrical systems, such as helm harnesses, gauge packages and accessory lighting circuits.

**Course Outcomes**

1. Identify American Boat and Yacht Council safety standards related to marine fuel and electrical systems.
2. Operate a Digital Volt Ohm Meter and test circuits for current flow, resistance and voltages.
3. State basic electrical theory as it pertains to marine DC electrical systems.
4. Diagnose and repair basic marine starting and charging systems.
5. Identify specific colors of wire and state their functions related to typical marine electrical systems

**MAR126L****Outboard Engine Maintenance**

Entry level fundamentals of recreational marine industry operations to include; but not limited to, model identification, service support literature, rigging and maintenance procedures for warranty support.

**Course Outcomes**

1. Perform preventative maintenance of marine engines including oil changes, tune-ups, lower unit fluid change, water pump impeller replacement and fuel filter maintenance.
2. Execute basic marine engine winterizing techniques such as fogging engines, preserving fuel systems and draining engine cooling systems.
3. Identify American Boat and Yacht Council safety standards related to marine fuel and electrical systems.
4. Perform basic tasks related to the un-boxing and installation of outboard engines including steering systems, control cables, fuel lines and electrical connections.
5. Resource service procedures and execute the process as published by the engine manufacture.



<b>ESNT120L</b>	<b>College Essentials</b>
<p>This course is designed to help the student learn to be a confident student and to master the skills needed to succeed in college. Every new student must take this course during his or her first semester. Topics to be discussed include: accessing college resources and services, navigating Canvas and online learning, information literacy, time-management, self-confidence in an academic environment, self-motivation, long and short-term goal-setting, career goals, maintaining physical, mental, financial, and emotional health and wellbeing. A minimum grade of C in this course is required for graduation from Lakes Region Community College.</p>	
<b>MAR227L</b>	<b>Marine Drive Systems Diagnostics and Repair</b>
<p>This course examines the maintenance, diagnostics and repair procedures for common marine stern drive engine packages. Drive-by-wire systems will be explored in depth along with maintenance and service procedures related to inboard engine transmissions.</p> <p>Course Outcomes</p> <ol style="list-style-type: none"><li>1. State theory related to propeller design and define the terms, pitch, ventilation and cavitation</li><li>2. Overhaul a marine engine outdrive, including bearings, shafts and related shimming techniques.</li><li>3. Make major repairs to marine engines using service literature to guide them.</li><li>4. Resource service procedures and execute the process as published by the engine manufacture.</li></ol>	
<b>MAR228L</b>	<b>Inboard Diagnostics and Repair</b>
<p>This course will cover theory and repair of stern drive engine systems such as internal engine, fueling, and electrical systems. Diagnostics skills will be developed as each system and its repair process is thoroughly examined.</p> <p>Course Outcomes</p> <ol style="list-style-type: none"><li>1. Operate a Digital Volt Ohm Meter and test circuits for current flow, resistance and voltages.</li><li>2. Identify specific colors of wire and state their functions related to typical marine electrical systems</li><li>3. Have a working knowledge and the ability to diagnose and repair marine fuel injection systems including outboard and sterndrive engine packages.</li><li>4. Identify marine engine cooling system operation, diagnostics and repair.</li><li>5. Make major repairs to marine engines using service literature to guide them.</li><li>6. Resource service procedures and execute the process as published by the engine manufacture.</li><li>7. Be proficient in the use of electronic diagnostic equipment to evaluate engine running problems.</li></ol>	



**MAR232L**

**Outboard Engine Diagnostics and Repair**

This course reviews two and four cycle engine theory emphasizing the application of fuel injection systems. Topics of theory include; cooling systems, fuel systems, powerheads and power transfer unites. Students learn to use the diagnostic software needed to evaluate components in these advanced systems.

**Course Outcomes**

1. Operate a Digital Volt Ohm Meter and test circuits for current flow, resistance and voltages.
2. Identify specific colors of wire and state their functions related to typical marine electrical systems
3. Have a working knowledge and the ability to diagnose and repair marine fuel injection systems including outboard and sterndrive engine packages.
4. Identify marine engine cooling system operation, diagnostics and repair.
5. Make major repairs to marine engines using service literature to guide them.
6. Resource service procedures and execute the process as published by the engine manufacture.
7. Be proficient in the use of electronic diagnostic equipment to evaluate engine running problems.