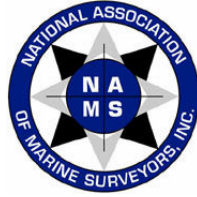


NATIONAL ASSOCIATION OF MARINE SURVEYORS



• *Yachts and Small Craft Apprentice Syllabus* •

The following syllabus has been developed for the apprentice surveyor and as guidance in developing a course of study for the profession of Marine Surveying.

WOOD HULLS

1. Construction Methods :
 - a. Carvel planked
 - b. Strip planked
 - c. Cold molded
 - d. Lapstrake
 - e. Edge glued
 - f. Batten seam
2. The Understanding of Lumber :
 - a. The characteristics of various species of ship lumber
 - b. The methods of sawing lumber and selection of
 - c. Rot resistance of various types of lumber
3. Advantages and Disadvantages of Types of Fastenings
4. Accepted Repair Practices :
 - a. Frame and butt block spacing
 - b. Sister frame application
 - c. Refastening
5. Maintenance and Care of Wood Vessels

METAL HULLS

1. Welding practices
2. Construction methods
3. Material selection
4. Repair Methods
5. Protective coatings
6. Properties of metals
7. Corrosion

FIBERGLASS HULLS

1. General Composites Knowledge :
 - a. Definition of composites
 - b. Advantages and disadvantages
2. Structural Concepts :
 - a. Single skin
 - b. Sandwich construction and theory of
3. Knowledge of Resins Types :
 - a. Polyester
 - b. Epoxy
 - c. Vinyl ester

FIBERGLASS HULLS CON'T.

4. Repair Considerations:
 - a. Overlaps
 - b. Secondary bonds
 - c. Material selection
5. Fiber Materials, Characteristics:
 - a. E glass
 - b. S glass
 - c. Kevlar
 - d. Carbon
6. Core Materials, Characteristics and Uses:
 - a. Polyvinyl chloride (PVC), cross-linked and linear
 - b. Balsa
 - c. Polyurethane
7. Osmotic Blisters:
 - a. Causes/Prevention
8. Composites Manufacturing Processes:
 - a. Open molding processes
 1. Hand lay up
 2. Spray-up
 3. Filament winding
 - b. Closed molding process
 1. Resin transfer
 2. Vacuum infusion
 3. Prepreg processing

ELECTRICAL

1. DC Systems, Basic Knowledge of :
 - a. ABYC, NFPA Standards
 - b. Bonding and Corrosion Control
 - c. Batteries, Type and Selection
 - d. Alternative Charging Systems

2. AC Systems, Basic Knowledge of :
 - a. ABYC, NFPA Standards
 - b. Grounding
 - c. Inverters
 - d. Corrosion Protection

MACHINERY

1. The principals of operation of :
 - a. Diesel engines
 - b. Gasoline engines
2. Exhaust Systems
3. Tankage, Materials Selection, Plumbing

SAFETY AND REGULATIONS

1. Demonstrate Knowledge of :
 - a. US Coast Guard Rules and Regulations for Recreational Vessels, CFR 33 & 46
 - b. American Boat and Yacht Council "Standards and Recommended Practices for Small Craft"
 - c. National Fire Protection Standard #302 "Pleasure and Commercial Motor Craft"
 - d. US Coast Guard 72 COLREGS, Navigation Rules, International & Inland
 - e. Offshore Racing Council "Safety Recommendations for Offshore Sailing"

SPARS AND RIGGING

1. Standing Rigging Material and Fittings
2. Cabin Stepped vs. Keel Stepped Masts
3. Critical Inspection Issues for Fittings and Attachments
4. Spar Material Advantages and Disadvantages
 - a. Aluminum
 - b. Wood, solid or hollow box section
 - c. Carbon
 - d. Steel

STABILITY

1. Demonstrate knowledge of the basics of stability :
 - a. Center of Gravity
 - b. Center of Buoyancy
 - c. Principals of Motion

GENERAL

1. The Surveyor's Role :
 - a. Responsibility to Clients
 - b. Relationship to third parties

2. The Written Report :
 - a. Scope and Objectives
3. Appraisals :
 - a. Methodology
 - b. Limiting Conditions
 - c. Ethics
4. Insurance :
 - a. Surveyor's Responsibility
 - b. Salvage Contracts
 - c. Understanding of Insurance Policies