

## ADVANCED CREW STANDARD

### Course Description

This live-aboard course develops the sailors' ability to assist a skipper as competent crew and effectively operate a sailing vessel day or night in an extensive range of possible weather conditions and up to 100 nautical miles from shore. Students will be provided the opportunity, as crew, to participate in vessel operation under sail and power while making a passage of 48 hours or more.

Practical topics covered include sail selection and use of the controls typically available on sloop rig vessels to maintain sail shape appropriate for the conditions encountered. Students will have the opportunity to practice and develop skills including coastal piloting, mooring pickup under sail, anchoring under sail and handling of emergencies including the actions to take in a crew overboard situation. Theory covered as part of this standard includes vessel propulsion and balance, basics of vessel stability, handling of emergencies, preparation for and dealing with heavy weather, weather forecasting with focus on systems lows and related frontal systems, piloting and navigation skills as well as vessel fall layup and spring launch.

This course builds on the skills developed in the Sail Canada Start Keelboat Sailing, Basic Crew or Basic Cruising and Intermediate Crew or Intermediate Cruising courses as well as the Basic and Intermediate Coastal Navigation courses. Candidates are expected to be able to competently demonstrate the skills developed in those courses.

It is envisioned that the program will be taught in a minimum six days to adequately cover all the performance objectives. A challenge of the standard must include a minimum of a 48-hour passage.

### Objective

To be able to act safely as crew of a sailing cruiser of 10 – 15 meters, any modern rig and inboard engine, operating within 100 miles of shore, by day and night in coastal or inland water in any weather.

### Prerequisites

Requirements prior to taking the standard:

- Sail Canada Basic Cruising or Basic Crew standard and Sail Canada Intermediate Cruising or Intermediate Crew standard,
- Sail Canada Basic Coastal Navigation and Sail Canada Intermediate Coastal Navigation Standards or Sail Canada Coastal Navigation Standard,
- ROC(M) VHF with DSC endorsement.

Requirements for certification:

- Pleasure Craft Operator's Card (or equivalent),
- Recognized Standard First Aid and CPR certificate.

Note: To maximize the likelihood of successfully completing the Advanced Cruising Standard, a student should:

- a) Have experience as skipper and/or crew of at least two seasons or 20 days of cruising, and;
- b) Be able to consistently use the knowledge and demonstrate the skills learned in the Intermediate Crew or Intermediate Cruising and Coastal Navigation Standards.

## Ashore Knowledge

### Section I: Sail Theory

The candidate must be able to:

1. Describe the theory of true and apparent wind;
2. Describe the theory of sailing with diagrams showing force diagrams of sails, keel and boat and a method of finding center of effort and center of lateral resistance;
3. Describe with the aid of diagrams the causes of lee and weather helm, and the method of correcting them;  
Included must be:
  - a) The reason for preference for slight weather helm,
  - b) The effects of adjustments in sail area made by sail change or reefing,
  - c) The effect of mast position and rake;

4. Describe the effects on sail shape of adjustments to the following:
  - a) Halyard tension,
  - b) Outhaul tension,
  - c) Boom vang tension,
  - d) Cunningham tension,
  - e) Traveller position,
  - f) Jib fairlead position.

### **Section II: Weather**

The candidate must be able to:

5. Describe the progress of a low pressure area and its associated warm and cold fronts with regard to their related winds, pressure changes, temperature changes, wind shifts and clouds and be able to use these factors to make elementary weather forecasts;
6. Demonstrate the ability to decode a surface level synoptic chart and describe the expected weather including forecast wind speed and direction, locations of highs, lows, fronts and their expected direction of motion;
7. Demonstrate an understanding of how to interpret a weather forecast in relation to expected maximum wave heights and wind gusts and related considerations when approaching land or establishing vessel route;
8. Give visual description of cirrus, altostratus and cumulus type clouds, and be able to describe the expected weather associated with each.

### **Section III: Safety**

The candidate must be able to:

9. Apply Rules 1 through 36, 40 and 45 of the *Collision Regulations* so as to be able to recognize all lights;
10. Cite from memory the distress signals in Annex IV of the *Collision Regulations*;
11. Describe the recommended methods of grounding for lightning for:
  - a) Permanent installation, and;
  - b) Temporary installation, for those vessels not so fitted.

### **Section IV: Use, Maintenance and Repair of Boat and Equipment**

The candidate must be able to:

12. Describe how to winterize candidate's vessel's hull and equipment in local area (excluding sails and spars) and to prepare for spring launch. In locations where the vessel is afloat all year, describe yearly haul-out and overhaul;
13. Describe seasonal checks of sails, spars, standing rigging, and running rigging;
14. List the factors that adversely affect electronic navigation aids typically found on a cruising vessel, such as Radar, GPS, AIS and other electronic navigation aids aboard the vessel being used for instruction.

### **Section V: Seamanship**

The candidate must be able to:

15. Describe two methods of using a second anchor to reduce swinging;
16. Describe:
  - a) When and how to use a trip line and anchor buoy,
  - b) Three other methods of recovering an anchor that is fouled on the bottom,
  - c) The procedures and dangers when using a breast anchor to hold a boat away from a dock or wharf;
17. Describe how the vessel should be handled and what remedial action should be taken when the following emergencies occur while under sail:
  - a) The vessel is dismasted,
  - b) The vessel runs aground on a lee shore;
18. Describe towing bridles for both disabled and towing boats and to describe precautions to be taken prior to getting underway, while getting underway, and while underway;
19. Describe the selection of sails for use on the vessel selected, in relation to weather, in all conditions likely to be found in the area of intended passage, and give reasons for the selections made. Include the full range of sail combinations available from full canvas to bare poles;
20. Describe the appropriate heavy weather precautions for the vessel selected, and describe how they are carried out. Include sail changes, use of special equipment such as safety harness, sea anchor, doubling up of gear, special checks in areas likely to chafe, storage of equipment above and below decks, checks on condition of dealing with and avoiding fatigue, selection of clothing, and schedule of watches;
21. Describe the actions in the vessel selected for heaving to and lying a hull;
22. Plan a cruise of five days with non-stop passage of 48 hours, taking into account food, watches, navigation (as per Sail Canada Standards) anchorages and alternative routes and shelters;

23. Describe (and where practical demonstrate) the appropriate remedial action for the following electro-mechanical problems:
  - a) Stoppage in the fuel supply line,
  - b) Failure of the engine's raw water pump impeller,
  - c) Defective starter motor and/ or glow plug solenoids,
  - d) Blocked or defective head,
  - e) Faulty domestic water systems,
  - f) Fire;
24. Describe when and how to carry out an oil change on the engine;
25. Describe how to change a fuel filter and bleed fuel supply lines for a diesel engine;
26. Demonstrate the use of safety harness, personal strobe light, and a 406 EPIRB;
27. Describe docking and leaving dock under sail;
28. Describe the dangers and/or risks associated with sailing in reduced visibility and at night, and procedures to minimize the identified risks and dangers;
29. Describe the general aspects of ballasted monohull yacht stability, including:
  - (a) Centre of gravity (CG),
  - (b) Centre of buoyancy (CB),
  - (c) Righting lever (GZ),
  - (d) Righting moment (RM),
  - (e) Angle of Vanishing Stability (AVS),
  - (f) Free surface effect;
30. Discuss the stability differences between ballasted monohull yachts and unballasted multi-hull yachts including:
  - (a) Sketch GZ curves for various types of vessels,
  - (b) Compare and contrast the GZ curves for traditional narrow beam heavy displacement vessels and modern wide beam high volume light displacement vessels,
  - (c) discuss the capabilities of the vessel used in the course.

## **Afloat Skills**

Recommended vessel should be a 10 - 15 meter, modern rigged, sloop rigged keelboat with an inboard engine.

### **Section VI: Preliminaries**

The candidate must, under direction of the skipper, be able to:

1. Check out a given boat for extended passage to include:
  - a) Soundness of hull, spars, rigging, deck hardware, sails, engine, internal systems, head, galley, stowage, safety equipment, spare parts,
  - b) Suggest needed improvements, repairs and additions to make the vessel totally seaworthy and sound.

### **Section VII: Underway**

The candidate must, under direction of the skipper, be able to:

2. Apply Rules 1 through 36, 40 and 45 of the *Collision Regulations*;
3. Manoeuvre under power in simulated tight conditions with high winds and/or tidal currents and dock the boat under same conditions;
4. Sail a vessel of the given size at an advanced level of skill, as crew, on all points of sail;
5. Assist skipper by handling ground tackle or helming while anchoring under sail;
6. Assist in picking up and depart from a mooring buoy under sail;
7. Take appropriate action in the event an engine fails in various conditions (to be simulated);
8. Check the tune of a mast;
9. Rescue a swamped dinghy and, if possible, stow it on deck while underway;
10. Perform the following crew overboard procedures by day and night:
  - a) Triangle method under sail,
  - b) Alternative method under sail,
  - c) Williamson and Anderson turns under power;
11. Simulate at least two different methods of recovering a crew overboard;
12. Prepare and serve a hot meal while underway;
13. Set anchor from a dinghy;
14. Set a Bahamian moor;
15. Act as responsible crew on a live-aboard cruise including:
  - a) A continuous passage of at least 48 consecutive hours,
  - b) Preparation and execution of a night pilotage plan.

### ***Section VIII: Navigation***

The candidate must, under direction of the skipper, be able to:

16. Determine deviation of the ship's compass using a transit;
17. Determine accuracy of knot meter and depth sounder and make instrument or process adjustments, as necessary;
18. Stand a navigation watch of 20 miles by day and 20 miles by night, keeping a full navigation log including the following:
  - a) Danger bearings,
  - b) Clearing bearings,
  - c) Advancing a line of position,
  - d) Distance off,
  - e) Plot course upwind including 3 tacks and resulting dead reckoning (DR) position,
  - f) Fix position using electronic navigation equipment,
  - g) Given leeway and or current, derive a course to steer over a 3-5 mile leg, and arrive within a quarter mile of the estimated position.

### ***Endorsements***

1. Make an eye splice in braided line.
2. Dock and leave dock under sail.
3. Pack, hoist, set, fly, gybe and douse a spinnaker.

### ***Outcomes and Evaluation***

Candidates capabilities as competent crew will be coached and evaluated throughout the training session. In addition to successful completion of the practical course candidates will be required to complete a closed book written exam that covers theoretical knowledge relevant to this standard. In order to complete certification a mark of 70% is required on the examination.

### ***Additional Notes***

This standard offers candidates the opportunity to develop day and night sailing skills in partnership with an instructor competent in those skills. The course helps sailors develop an understanding of the components of risk that sailors continue to face in their on-water activities. Participants in this course will experience actions and procedures that mitigate risk while underway.

### ***Physical Requirements for Candidates***

This training is offered in a live-aboard format and courses include periods (48 hours or more) of continuous passage making. Participants will have the opportunity to experience sun, wind, spray, rain, and temperatures consistent with the time of year they take part in this activity. When underway the vessel may exhibit irregular motion due to wind and waves and temperatures may be cooler than on land. Participants will be expected to move around the vessel day and night, to learn and demonstrate skills and to perform tasks while the vessel is at the dock, at anchor, and when the vessel is underway. Vessels will be underway both day and night in a wide range of conditions which may include large seas and strong winds. Participants will be challenged to work as a part of a team and operate the vessel for two or more days with limited or irregular periods of rest. These training sessions will require short periods of moderate upper body exertion, a moderate level of arm strength and some core body fitness and stamina.

### ***Resource Material***

Passage Maker, US Sailing