Proposal for Invictus Boat Handling Course

Designed to teach all common boat-handling maneuvers, including entering and leaving a slip, docking and undocking, anchoring, and tying up to and leaving a mooring. The student would learn the effects that wind and current forces have on their boat, and how to apply this understanding to the basic boat handling maneuvers. One of the objectives of this course and the other advanced Invictus courses is grooming skippers – providing them the training and practice needed to skipper the Invictus and other similar sized boats. Consistent with that objective, taking this course is an opportunity to demonstrate the ability to meet one of the major criteria for being an Invictus skipper, namely, the ability to maneuver the boat under power and execute the common boat-handling maneuvers cited above[1].

1. Class Format and Scheduling

The Boat Handling course would consist of two classroom sessions (7:00-9:30PM) and two half-day boat sessions, scheduled as either two weekend half-day boat sessions, or two evening boat sessions and one half-day weekend boat session, to be determined. The weekend half-day sessions would be either 9:00 AM to 1:00 PM, or 1:00 PM to 5:00 PM, and the evening boat sessions would be from 6:00 PM to 8:30 PM. The classroom sessions would be held at Brookdale in a vacant room.

There would be two complete Boat Handling courses scheduled for the sailing season, dates to be determined. Each course is limited to 8 students, with an additional limit of 4 students in the water sessions (this means that two sets of boat sessions will be scheduled if there are more than 4 students in the course). The tentative sequence of classes over two consecutive weeks would be as follows:

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	
First classroom session – 2.5 hrs, 8 students		First water session – 2.5 hours, first 4 students	First water session – 2.5 hours, second 4 students		Second water session – 4 hours (9:00-1:00), first 4 students	Second water session – 4 hours (1:00-5:00), second 4 students
Second classroom session – 2.5 hrs, 8 students		Third water session – 2.5 hours, first 4 students	Third water session – 2.5 hours, second 4 students			

This would provide the 5 hours of class time and 9 hours of water time, consistent with the constraint of a maximum of 4 students for the water session. Variations could be scheduling a second Saturday instead of the week-night water sessions, but this ties the boat up for a second Saturday, and leaves a wide gap between classroom and water session. Sundays would be the rain date for Saturday, Invictus schedule permitting. Week-night water sessions could be held on Tuesdays and Wednesdays instead of Wednesdays and Thursdays to keep the boat free for

[1] Invictus skipper certification (see Appendix for details) is independent of this course, and the successful completion of this course does not imply any certification. However, as outlined in the certification qualifications, one qualification criterion is having a member of the Invictus Skipper Certification Committee vouch for the applicant's skills. In keeping with the SEAS Monmouth objective of grooming qualified Invictus skippers, taking this course may be able to be used to meet this criterion by having the Boat Handling Course instructor vouch for the applicant's skills. Note that other, sailing-related skills are necessary for certification, which are not taught in the Boat Handling Course. See the Invictus Advanced Sailing Course for more details.

Thursday night sails. Also, if enrollment is less than 8, suitable consolidations in the water sessions can be made (e.g., consolidating into Wednesday evenings, and Saturday mornings).

2. Cost

The cost would be $110 per student for the 5 hours of classroom time and 9 hours of water time. The cost includes a soft-cover handbook of boat handling maneuvers ("Dockmanship", by David Owen Bell – $6.95 at Amazon.com), and classroom handouts. The handouts would summarize all the material taught.

3. Syllabus (DRAFT)

3.1 First Classroom Session (2.5 hours, up to 8 students)

[Use pictures and/or PC multimedia; give out Invictus User Guide, and handouts for first class]

1. Introduction to the boat (*10 minutes*)
    a. Brief description of Invictus inside and out (show pictures)
    b. Summary of SEAS Monmouth policies covering Invictus (use handout or viewgraph)
        1) Skipper qualification and certification
        2) Rules and regulations – gasoline replacement, log, reporting damage, etc.
2. Outboard engine (use pictures of engine and lazarette) (*10 minutes*)
    a. Gasoline management
        1) Mixing gas and oil and filling cans
        2) Hooking up gas cans
        3) Trip planning – 1/3 going, 1/3 returning, 1/3 reserve
    b. Starting and stopping engine
3. In and out of Invictus' slip (show pictures or video) (*30 minutes*)
    a. Departure preparation (cover highlights of checklist)
    b. Crew readiness
    c. Sequence of lines for leaving
    d. Backing out into channel and leaving marina
    e. Returning to marina and channel
    f. Entering slip and securing boat
4. Motoring (*15 minutes*)
    a. Throttle control
    b. Steering
    c. Water depth and channels; running aground
    d. Rules of the road

e. Engine failure

5. Safety (*15 minutes*)
   a. Safety equipment
   b. Crew-Over-Board (COB) basics
   c. Important USCG regulations
6. Break (*10 minutes*)
7. Effects of wind and current (*15 minutes*)
   a. Wind
      1) Effect of the wind on the boat ("weathervane" at slow speeds, i.e., weak steerage)
      2) Stability of stern into the wind
      3) Figuring winds into boat handling maneuvers
   b. Current
      1) Effect of current on free-floating boat (no "weathervaning")
      2) Control of boat requires net movement in water
      3) "Treading water" - procedure for waiting for bridge openings
      4) Figure current into travel time and gas consumption
      5) The effects of both winds and currents
8. Docking in winds and currents (*45 minutes*)
   a. General Steps (light to moderate wind parallel to dock, no current, bow into the wind)
      1) Ascertain the wind and current; check out the dock situation, including obstructions
      2) Plan your sequence of steps - the direction of approach; the sequence of tying up the boat; communications with the crew
      3) Prepare lines and fenders
      4) Approach with enough speed to maintain control
      5) Proper approach angle for boat trajectory (20-30 degrees) and round-up at last minute
      6) Reverse to stop forward motion if necessary
      7) Jump off and stop with a "spring" line (use bow line if heading into wind), if boat is still moving (only if it is going very slowly!)
      8) Tie up boat (bow line, stern line, two spring lines) with windward lines tied first
   b. Docking in wind blowing off of dock (light winds or stronger winds)
      1) Need steeper approach angle
      2) Tying windward lines (bow first, or both bow and stern if possible)
   c. Docking in wind blowing on to dock (light winds only)
      1) Need shallower approach angle
      2) Strong winds – think about alternatives

d. Alternatives for docking in stronger winds

1) If wind is blowing into dock, find a more favorable dock or part of the dock (e.g., the side of the dock)

2) Consider stern-to-wind approach for better stability

3) Consider warping to get boat into final position (use example of docking on side of dock, stern-to-wind, and warping around to front of dock)

e. Docking with currents

1) Use "treading water" if current is parallel to dock, and steering to dock; tie bow up first (assuming it is upstream)

2) If current is perpendicular to dock (pushing away), steepen approach angle; if current is strong, ease bow up to dock and tie it up; pull stern up to dock by hand, or by warping

3) If current is pushing toward the dock, use more shallow approach angle; if current is strong, consider alternatives (e.g., a perpendicular side)

4) You may need to consider effects of both current and wind

f. General procedure for leaving the dock

1) Ascertain the wind and current; check out traffic situation, including obstructions; think through the effects of wind and current when the boat is untied.

2) Plan your sequence of steps – especially the untying sequence – and communicate with the crew

3) Remove unnecessary lines; retie other lines using loops if necessary

4) Assuming bow is into wind, release bow line and push bow away from dock; if stern line is not needed to prevent boat from drifting downwind, release it also (otherwise, delay); release stern line and motor away from dock. This procedure should work for various wind directions unless wind is strong, and/or there are obstructions.

5) For strong stern wind, consider releasing stern line and pushing stern away from dock; release bow line at same time or when backing away from dock.

6) If a strong enough wind is pushing into the dock, consider using warping to put bow (or stern) into wind

7) If wind is pushing boat away from dock, release lines, let the boat drift out, and motor away

3.2 First Water Session (2.5 hours, up to 4 students)

1. Boat Tour (*10 minutes*)
   a. Lazarette contents
   b. Electrical panel
   c. Safety equipment
   d. Dock line configuration
2. Motor and Gasoline Management (*15 minutes*)

a. Gas cans, oil/gas mixture

b. Hooking up gas lines

c. Raising/lowering engine

d. Practicing starting and stopping the engine

3. Preparations for Departure (*10 minutes*)

   a. Stow all gear

   b. Follow checklist for departure

4. Instructor demonstration of leaving/returning to Invictus' slip (*15 minutes*)

   a. Instructor should leave the slip and take boat to center of river, explaining all the steps of the process

   b. Instructor should return to the slip, explaining all the steps of the process

   c. Instructor should repeat the departure procedure and remain in the middle of the river for motoring exercises

5. Motoring Skills (*1 hour and 10 minutes*)

   a. Basic motoring practice (*30 minutes*)

      1) Speed control; forward and reverse; quick reverse; getting the feel of the throttle

      2) Turns, using tiller alone or tiller and motor for tight turns

      3) Effect of the wind on the boat; the bow as a "weathervane" at slow speeds (steerage takes net movement in the water)

      4) Stability of stern into the wind

      5) Water depths, depth gauge, staying in channel, and running aground (demonstrate recovery)

      6) Reinforce rules of the road while motoring

   b. Practicing motoring in currents (*20 minutes*)

      1) Effect of current on free-floating boat; no "weathervaning" with currents

      2) Demonstrate the effects of both winds and currents

      3) Control of boat requires net movement in water (bow into current is better)

      4) "Treading water" (balancing engine speed against current), and its use in procedure for waiting for bridge openings

   c. Engine Failure (*20 minutes*)

      1) Assess winds and currents, and nearby obstacles

      2) Try to restart engine; check gas and switch cans if necessary (good to do before critical situation); don't spend too much time trying to start engine.

      3) Raise jib if there is wind, little current, and it is rigged (main sail may take too long)

      4) Drop anchor (either right away if there is a current, or as a last resort)

3.3 Second Water Session (4 hours, up to 4 students)

1. Leaving and entering Invictus' slip (Student practice) (*2 hours*)
    a. Leaving the slip
    b. Motoring in circle
    c. Re-entering the slip
2. Docking with Winds and Currents (*1.75 hours*)
    a. Practice basic docking and undocking, reinforcing general steps (light to moderate wind parallel to dock, bow into the wind)
        1) Docking general steps
            a) Ascertain the wind and current; check out the dock situation, including obstructions
            b) Plan your sequence of steps - the direction of approach; the sequence of tying up the boat; communications with the crew
            c) Prepare lines and fenders
            d) Approach with enough speed to maintain control
            e) Proper approach angle for boat trajectory (20-30 degrees) and round-up at last minute
            f) Reverse to stop forward motion if necessary
            g) Jump off and stop with a "spring" line (use bow line if heading into wind), if boat is still moving (only if it is going very slowly!)
            h) Tie up boat (bow line, stern line, two spring lines) with windward lines tied first
        2) General steps for leaving the dock
            a) Ascertain the wind and current; check out traffic situation.
            b) Plan your sequence of steps – especially the untying sequence – and communicate with the crew
            c) Remove unnecessary lines; retie other lines using loops if necessary
            d) Assuming bow is into wind, release bow line and push bow away from dock; release stern line and motor away.
    b. Alternatives for docking in stronger winds parallel to dock **(*Needs more detail*)**
    c. Docking in wind blowing off of dock (light winds or stronger winds) **(*Needs more detail*)**
    d. Docking in wind blowing on to dock (light winds only) **(*Needs more detail*)**
        1) Demonstrate warping
3. Return to slip and close up the boat (*15 minutes*)
    a. Designated student will return boat to slip
    b. Follow close-up checklist
    c. Make log entry

3.4 Second Classroom Session (2.5 hours, up to 8 students)

(Needs detail)

1. Moorings
2. Anchoring
3. In and out of slips – II

3.5 Third Water Session (2.5 hours, up to 4 students)

1. Depart slip and motor to river (*15 minutes*)
2. Practicing tying up to a mooring with winds and currents (*45 minutes*)
    a. Check clearance with respect to other boats (allow for current and/or wind shifts)
    b. Approach bow to wind in light winds, stern to wind in stronger winds
    c. Signaling between crew member at bow and helm
3. Practicing anchoring (*1 hour, 15 minutes*)
    a. Planning anchoring point
    b. Wind/current direction
    c. radial clearance (and depth) around anchoring point
    d. Communications with crew, including hand-signals
    e. Proper amount of anchor line - scope, free-board height, tide changes
    f. Dropping anchor
    g. Backing up to test the hold (three RPM levels)
4. Returning to port (*15 minutes*)
    a. Designated student will return boat to slip
    b. Follow close-up checklist
    c. Make log entry

Appendix – Invictus Skipper Qualifications
(from the "SEAS Monmouth Skipper Orientation" document, August 20, 2006)

Level I, River (Pintail & Javelin only)

- Applicant must have taken the Basic Sailing Course, or have equivalent sailing experience.
- Applicant must demonstrate his/her ability to maneuver the boat under power and sail. On the water experience sufficient to command a boat in the Shrewsbury River will be required. At least one member of the SEAS Monmouth Skipper Certification Committee will have to personally vouch for the skipper applicant, based on first hand sailing experience with the applicant. Demonstration of sailing skills will be required, including dropping anchor under sail, and pulling in and out of a slip. Advanced Sailing Classes are offered for the acquisition of these skills.

Level I (Bay)

- Applicant must have taken the Basic Sailing Course, or have equivalent sailing experience.
- Applicant must demonstrate his/her ability to maneuver the boat under power and sail including pulling in and out of a slip, anchoring in a cove and dropping an anchor under sail. Advanced Sailing Classes are offered for the acquisition of these skills.
- On the water experience sufficient to command a boat in the Sandy Hook Bay will be required. At least one member of the SEAS Monmouth Skipper Certification Committee will have to personally vouch for the skipper applicant, based on first hand sailing experience with the applicant.

Level II

- All Level I pre-requisites, and…
- The applicant must have skippered Invictus at least 4 times as a ***Level I*** skipper before being considered for Level II. The SEAS Monmouth Skipper Certification Committee will evaluate the skipper' s resume and prior sailing experience, and may waive this requirement, based on these criteria.
- Demonstrate ability to safely control the vessel in varying tides & currents under bridges. At least one member of the SEAS Monmouth Skipper certification committee will have to personally vouch for the skipper applicant, based on first hand sailing experience with the applicant. Demonstration of sailing and anchoring skills will be required, including picking up a mooring under sail, dropping anchor under sail, pulling up to a dock and pulling in and out of a slip.

Level III

- All Level II pre-requisites, and…
- Completion of navigation course by a nationally known organization will be required for navigation beyond the confines of the Shrewsbury River and Sandy Hook. The course should be the Power Squadron Piloting course or the equivalent. Organizations that will be recognized are the Coast Guard Auxiliary, ASA or US Sailing. Written documentation will be required. Passing the SEAS National SQB navigation test will be accepted in lieu of the above.

- On the water experience sufficient to command a boat in New York Harbor will be required. This will include a written resume submitted to the SEAS Monmouth Skipper Certification Committee. At least one member of the committee will have to personally vouch for the applicant, based on first hand sailing experience with the applicant. In addition, demonstrated knowledge of all boat systems and basic maintenance and mechanical skills will be required. Appendix 1 is a checklist of electrical and mechanical skills. Workshops will be provided to acquire these skills.