TEACHING SYLLABUS **(revised 12/21/14)**

NAUT 001ax: Deepwater Cruising: COURSE TEACHING SYLLABUS
Crew Level: 2 (semester) academic units

General Information

No Prerequisite: Credit Class, but not available for degree credit
Instructors: Capt. Ron Remsburg, Capt. Lars Harding, Capt. John Ugoretz, Capt. Noah Peffer
Text: The Annapolis Book of Seamanship, J. Rousmaniere
Video: Cruising Under Sail
Charts: 1210TR Martha's Vineyard to Block Island (required)
18746 Catalina Channel (optional)
18751 Los Angeles Harbor (optional)

Office: PED 104 5:30-6:45 pm. Weds.,and by appointment (Capt. Remsburg, Director)
Phone: (213) 821-1261 remsburg@usc.edu
Website: priceschool.usc.edu/naut/

Grading Policy: Nautical Science classes include class lectures, dockside demonstration, voyages, and a review session at semester end. It is highly recommended that students attend all four events, as they contribute to the academic concepts and skills tested on the final exam, which is the 100% basis of the course grade. The final exam covers seamanship skills and academic navigation chart work, 50% each area, and is administered according to the University published final exam schedule. Students who sign up for an event and do not attend without making prior arrangements are subject to possible grade reduction.

Vessels used: 51' traditional sailing schooner and 36' modern cruising sloops

Meeting Periods:
Classroom: 16 lecture hours and 3 hour review session
Practical Aboard: 16 hours lecture/applied skills
16 hours non-structured time aboard
Dockside Demonstration: 3 hours

Course Syllabus

Seamanship Theory

I. Basic Nomenclature of a Sailing Vessel
A. Hull nomenclature
1. Hull types
a. displacement hulls
b. planing hulls
2. Hull measurement
3. Theoretical hull speed
4. Types of hull shapes
5. Freeboard and topsides

- B. Rigging nomenclature
  - 1. Standing rigging
    - a. forestays, jibstays, headstays
    - b. shrouds
    - c. backstays--permanent and running
  - 2. Running rigging: systems and operation
    - a. halyards
    - b. sheets

II. Basic Types of Sailing Vessels and Their Operation
- A. Sloop
- B. Ketch
- C. Yawl
- D. Schooner

III. Sailing Vessel Sails
- A. Types and parts of sails
- B. Jib-headed and gaff-headed sails
- C. Loose footed/club footed jibs

IV. Sailing positions
- A. Beat
- B. Close reach
- C. Beam reach
- D. Broad reach
- E. Run

V. Sailing maneuvers
- A. Coming about
- B. Jibing

VI. Tacking for specific points

VII. The problem of being in irons
- A. Causes and prevention
- B. Securing a specific tack

VIII. Leeway and Course Heading

IX. Centerboard and Daggarboard operations

X. Aerodynamics of sail
- A. Venturi/Bernoulli effect
- B. Newton's Third Law of Motion
- C. Signs in sails--given course and wind affecting sail adjustment

XI. Reefing
- A. Reefing techniques and functions
- B. Reefing equipment

XII. Basic mooring and anchoring theory

XIII. Docking techniques and functions

XIV. Marlinspike seamanship
- A. Coiling and heaving lines
- B. Basic knots and their functions
- C. Types of line and their functions

XV. Basic rules of the road
- A. Power vessels
- B. Sailing vessels

XVI. Watch station overview: Crew

Navigation Theory

I. Charts
   A. Scales and charts
   B. Chart agencies and ordering
   C. Soundings and depth findings
II. Chart symbols and aids to navigation
   A. Lighted and unlighted markers
   B. Major beacons and their signals
   C. Aids to navigation in a channel
III. Definition of position: Latitude and longitude determination
IV. Measurement of speed (knots); Distance and time calculation
V. Errors in the magnetic compass
   A. Variation
   B. Deviation
VI. Plotting a course (headings and distances)
VII. Bearings, L.O.P.'s and fixes

Practical Offshore Sailing Operations During Two-Day Catalina Voyage

Operations Day 1:

1. vessel operational orientation--review of sail handling
2. safety equipment: EPIRB, raft, life jackets, distress signals, VHF use emergency channel 16, fire fighting equipment, GPS man overboard function
3. navigation orientation--dockside fix, course and distances for entire voyage, AIS, GPS and radar orientation
4. beam bearing procedures between helmsman and navigator for the purpose of starting/recording ship's speed log
5. use of lines and fenders while initiating vessel underway from dock
6. underway speed/log check and ship's compass check
7. navigational fix in harbor coordinated with depth finder and GPS
8. procedures of sail raising without the use of engine
9. demonstration of vessel sail balance with regard to raising, lowering sails and steering
10. demonstration of vessel in irons and techniques for obtaining desired given tack
11. procedures in starting an offshore voyage
12. techniques of refined sail trim
13. operational ship's watch procedures (navigation watch/deck watch)
14. man made and natural ranges
15. right of way review
16. collision bearings
17. steering by compass and landmark
18. speed-time-distance problems
19. determining vessel speed by timing passing object
20. predicting ETA
21. techniques of sail lowering and furling
22. mooring procedures

Operations Day 2:

1. GPS and radar interface demonstrated
2. demonstration of the use of ship's radio: U.S. Coast Guard emergency channel 16, bridge to bridge channel 13, weather information channels, placing telephone calls with local marine operators
3. use of the Automatic Identification System (AIS) and Global Positioning System (GPS)
4. reorientation of new students aboard
5. techniques of leaving a mooring
6. steering and maneuvering a vessel in limited quarters
7. standard coastal navigation along north shore of Catalina
8. use of bow beam bearings to indicate distance off a mark; check by radar and GPS
9. discussion of Catalina anchorages with regard to local weather
10. techniques of sail balance in reefing, heaving to and running before heavy winds and seas
11. navigational turn bearings
12. location of submarine canyon by use of depth finder coordinated with ETA/speed, time, and distance problems
13. determination of ship's speed by timing passage of object thrown overboard
14. rights of way, collision course determination at sea by AIS, visual bearing, radar bearing and sound bearing in fog
15. docking

CNET Skills Profile for Crew Level Course (301a)

Mission: to train a student in the fundamentals of sailing theory, marlinspike seamanship, ship handling and rules of the road. Upon completion of the course, the student will be able to perform the duties of crewman on an offshore sailing vessel as outlined in Offshore Sail Training Manual P1552/1 (Series) and in accordance with the applicable sail training manual(s). Chief of Naval Education and Training.

Profile Statements: Tasks Taught

1. Identify lines, rigging and sails on a sailboat using standard nomenclature
2. Identify standing and running rigging associated with the use of sails
3. Identify common sailing rigs
4. Analyze the forces applicable to the aerodynamics of sails
5. Locate and identify a sailing vessel safety equipment and running rigging.
6. Identify basic principles and skills of marlinspike seamanship
7. Identify the use of the square knot, bowline, clove hitch, stopper knot, and half hitch
8. Identify the function of mooring system components
9. List the sequence of steps for anchoring a sailing vessel
10. Identify ground tackle associated with a sailing vessel anchoring
11. Trim sails for each point of sail
12. Identify environmental and inherent factors associated with ship handling
13. Assist in mooring a sailing vessel
14. Assist in anchoring a sailing vessel
15. Identify terms and definitions associated with Rules of the Road
16. Identify lights required by Rules of the Road for sail and power vessels
17. Identify crewman watch station requirements for an offshore sailing vessel
18. Maneuver a sailboat to each of the four points of sail
19. Chart reading and basic navigation
20. Safety systems