Advanced Navigation and Seamanship-Syllabus

Naut. 002Ax: (Fall Semesters)
2 Academic units ea. course
Classes for full university credit- not for degree credit for some majors

General Information

Prerequisite: Naut. 001B
Instructors: Capt. Lars P. Harding/ Staff
Office: PED 104, by appointment
Phone: 213 821-1261 or 562 230-5277
Email: larspharding@hotmail.com / Ugoretz@cox.net
Web Address: usc.edu/sppd/naut

Text: USDHS-USCG Navigation Rules Int. and Inland
      Piloting, Seamanship & Small Boat Handling, Chapman
      Celestial Navigation, Tom Cunliffe
Charts: 1210 TR Martha’s Vineyard to Block Island (optional)
       18746 U.S. West Coast- San Pedro Channel (optional)
       18749 U.S. West Coast – San Pedro Bay (optional)
USDHS-USCG Navigation Rules Int. and Inland (Required)

Grading Policy: Naut002A class includes: campus lectures, practical “at sea labs”, demonstrations, a
midterm and a final exam. Students are required to attend all course segments, these
contribute to the academic concepts and skills required for USCG-MMD licensed
mariners and will be tested on the final exam. The grading policy is based on attendance
at practical’s/labs, the midterm and final exam. Course grading will be 50% on the labs &
practical’s, 10% on the midterm and 40% on the final exam. The final exam will be
administered following the university published final exam schedule. Students with
unexcused absences at practical labs may be subject to a grade reduction and possible
downgrade of “license track exponential sea time” to actual sea time served.

Meetings
Classroom: Naut002a - 28 lecture hrs.
Practical/Labs 240 Practical Lab hours
“at sea” 16 hours Skipper Preparedness Training & Life Raft Training
24 hrs. Performance Boat I Instruction
8 hrs. 1-day Practical instruction sail
24hrs. NROTC Midshipmen crew
24 hrs. 1st Mate Training Sail
48 hrs. 2nd Mate Training Voyages
96 hrs. 1st mate voyages as crew for 001A
Enrolled students also serve additional days at sea in the capacity of 1st and 2nd mates
with the 001A and 001B classes and aboard the Los Angeles Maritime Tall Ships.
4 hrs. Navy Ship Day WWII destroyer “Iowa”(lecture hrs)
8 hrs. Day aboard working Offshore Supply ship, towing and bunkering (lecture hrs)
4 hrs. Day aboard working containership @ port of LA/ Long Beach (lecture hrs)

Total Instructional Hours 268

Course Obj. Prepare students for the USCG- MMD license per the USC-USCG UNIV Certificate for Sea time.
Classroom Syllabus
(Conducted in a Seminar Format)

I Classroom Theory and Application
A. Navigation Proficiency (Review 001A &001B)
   1. Dead Reckoning
   2. Latitude/Longitude Fix
   3. 3 Bearing Fix
   4. Bow Beam Bearings
B. Navigation & Fixes
   1. Ancient Navigational charts and tools
   2. 20th Century advancements in navigation
      a. Radar
      b. Radio directional finders
      c. Loran
      d. GPS
      e. AIS
      f. Sonar
   3. Compass Correction
   4. Turn Bearings
   5. Danger Bearings
   6. Distance & Range Fix
   7. Running Fix
   8. Tides and Currents
   9. Set and Drift
   10. Radar observer and radar fix
   11. VHF
   12. Introduction to Celestial Navigation
D. Lateral Aids to Navigation- Advanced
E. Intro to “Man-overboard recovery procedures”
F. Damage Control
   1. Prioritizing Damage
   2. Fire safety and Firefighting
   3. Flooding and Sinking
   4. Rigging and Structural damage
   5. Communications with authorities
   6. Life Rafts and survival equipment
   7. Damage control equipment and crew protocols
   8. UPV safety equipment
G. Sailing and Heavy Weather Seamanship
   1. Wave structure
   2. Heave-to
   3. Warps and sea anchors
   4. Broach, capsize, pitchpole, heave, yaw, roll, surge
H. USDHS-USCG “Navigation Rules Int. and Inland” book (International focus in fall semester)
   i. Part A and B - Steering & Sailing Rules
   ii. Part C - Lights and Shapes
   iii. Part D - Sound and Light Signals
   iv. Part E - Exceptions and Annexes

II Field Experience
   A. Sail Loft (Elliot Patterson Sail Makers tour)
   B. Ship Yard (Marine Survey Tour) Wayne Edel “Maritime Preservation Society” boat yard
   C. Day aboard a working “Offshore Supply Ship”, Barge handling & bunkering
   D. Day aboard working container ship at port of LA/Long Beach
   E. Navy Ships & Destroyers- day aboard WWII battleship “Iowa”
   F. First Aid/CPR/AED training (4 hrs.) taught @ USC Health Center and AHA recognized training representatives “the Life Saver Team”, Los Angeles CA
      1. Building a 1st aid- 1st response emergency kit aboard

III. Practical Operations Aboard (see Nautical Science Instructor Manual pg. 51)
   A. Operations Systems- 1st Mate/ @ 2nd Mate (001B Day/Night Navigation)
   B. Anchoring
   C. Pier/mooring approaches and departure
   D. Rules of the road, sound signals, navigational lights, steering rules
   E. Advanced navigation- Piloting & Electronic
   D. Sail & Line Handling- (in Port) Flaking, furling, stowing. (Sea ready underway) line and sail stowage
   F. Marlinspike seamanship

IV. Celestial Navigation
   A. Sextant and Celestial navigation basics
   B. Latitude Determination
   C. Table Reference/ Longitude determination
   D. Account for Ocean tides, currents, seasonal wind patterns, Seasonal ocean routes for sailing vessels.
   E. Publications, pilot charts, sailing routes