

(Revised 7/2019)

Nautical Science Program – Naut. 002A
Master's – Seamanship and Navigation, Level 3
USCG Merchant Mariners Masters Credential
Preparation Course

Academic Units: 2

Offered Fall Semester

Class days: Wednesday's 3:00PM – 4:50PM

Contact Hours: Total 240 hrs.

Campus Lectures – 28 hours

Sea-time Laboratories – 208 hours:

8-hour Skipper Preparedness Training Laboratories

Two-day (24 hours) Performance Boat I Sail Training

8-hour Practical Instruction Sail

24 hours (2 days) NROTC Midshipmen Crew Training

24 hours (2 days) 1st Mate Training Sail

48 hours (4 days) 2nd Mate Training Voyages

48 hours (4 days) 1st Mate crew on 001A Voyages

4-hours Navy Ship Day WWII Destroyer "Iowa"

8-hours aboard working offshore supply ship "Robyn J"

4-hours aboard working container ship in port

8-hours 1st Mate for Dockside Demonstrations

4-hours "Maritime Preservation Trust" tour

Location:

<http://priceschool.usc.edu/naut/>

USC Campus for weekly lectures.

Off campus laboratories- San Pedro, Long Beach and Port of Los Angeles.

Instructors:

Captain Lars Harding, Program Administrator & Staff

Office: Physical Education Building - PED 104

Office Hours:

Capt. Harding, By appointment or drop-ins on Wed's 1:30-2:30PM

Contact Info:

Captain Harding - (562) 230-5277, Lharding@usc.edu

Phone and email messages will be returned within 48 hrs.

Note: When engaged in offshore voyages with students there may be a delayed response.

USCG Accreditation:

This course is certificated by the United States Coast Guard for license track students pursuing a "Merchant Mariners Masters Credential" (**USCG Certificate UNIVSC-155**).

Course Description:

Maritime navigation, charting, piloting and electronic instrumentation are the primary focuses of this course. Students also learn the history of ancient navigation used by early mariners from around the world. They practice traditional navigation methods using a variety of techniques and tools to calculate positions on paper charts, many of these methods are still in use aboard ship today. The foundation of navigation is rooted in mathematics, geometry and trigonometry, students learn to apply these disciplines in a variety of ways to become proficient navigators. Successful students learn to apply other disciplines such as; astronomy, meteorology and physics in a variety of techniques. Modern day marine electronics dominate navigation aboard the bridge of a ship in the 21st century, students learn about the scientific concepts these devices are based upon and then practice the operation of these systems aboard a working sailing ship at sea. Successful students leave this course as competent navigators, able to safely operate their vessel day or night or in a variety of meteorological conditions. Students also become proficient in the application of Coast Guard rules and admiralty laws governing the piloting of vessels through busy shipping ports and among the commercial traffic of coastal waterways and harbors.

Additionally, this course covers marine safety, marlinspike seamanship, U.S. Coast Guard piloting rules and regulations, command/vessel operations, damage control, advanced marine meteorology and aspects of celestial navigation. This course is also designed and accredited by United States Coast Guard to prepare license track students for the rigors of the federal merchant mariners licensing examination.

At-Sea laboratories will include practical application of advanced sail training and handling skills, advanced vessel maneuvering skills under both power and sail, application of advanced navigation and piloting skills, operation of navigational marine electronics, advanced anchoring, docking and mooring skills.

Learning Objectives:

Students gain knowledge and understanding of the following vessel command skills:

- United States Coast Guard (USCG) licensing requirements
- U.S. Department of Homeland Security (USDHS)/USCG Navigation Rules- International
 1. Lights and Shapes
 2. Sound Signals
- Advanced navigation, charting, marine related electronics
- Advanced marine meteorology and forecasting
- Boat handling, maneuvering, man-overboard recovery, safety, and CPR/1st Aid.

Prerequisite(s): Nautical Science 001A and 001B

Co-Requisite(s): None

Concurrent Enrollment: Special dispensations for concurrent enrollment may be discussed in person and are based on experience and approval by the Nautical Science Program Administrator.

Course Notes:

Course enrollment is allowed for Letter Grade, Pass/Not Pass, and Audit. Attendance to all lectures and off-campus laboratories/ sailing events is required. Dates for these components of the course will be arranged during the first three weeks of lectures. Copies of lecture slides, instructional videos, and other class information will be posted on Blackboard. **License track students are required to take this course for a letter grade to be granted exponential sea time and USCG course completion certificate.**

Required Readings and Supplementary Materials

The following are available at the USC Book Store & Safe Navigation Stores

Text:

USDHS-USCG Navigation Rules International and Inland (Required)

Piloting, Seamanship & Small Boat Handling, Chapman

Celestial Navigation Tom Cunliffe

Charts: 1210 TR Martha's Vineyard to Block Island (Provided)

18746 U.S. West Coast- San Pedro Channel (Provided)

18749 U.S. West Coast – San Pedro Bay (Provided)

Pacific and Northwest Tide and Current Tables (Provided)

Description and Assessment of Assignments:

A mid-term examination will be given during the 7th- 9th week of classes. Attendance is mandatory to all campus lectures and off campus sea laboratories. The final examination will require significant demonstration of charting, navigation and seamanship skills acquired during off campus events.

Grading Breakdown:

- 5% Lecture attendance. Note that attendance is required to participate in the off-campus laboratories
- 30% Midterm Examination
- 20% "Performance Boat I", "002A Practical Day Sail", "Skipper Preparedness", CPR/AED/1st Aid Labs
- 45% Final Exam

Grading of Final Examination

(Due to the challenging nature of this exam and historical results the following curve is used)

A	95-100
A-	80-94
B+	77-79
B	66-76
B-	60-65
C+	57-59
C	53-56
C-	50-52
D+	47-49
D	43-46
D-	40-42
F	39 and below

Course Grading Scale

≥ 90% = A ≥ 80% = B ≥ 70% = C ≥ 60% = D, Failing Work < 45% or missing assignments or attendance

Assignment Submission Policy

Mid-term examination must be taken during the scheduled lecture. Participation in off-campus instructional laboratories and multiple sailing voyages is mandatory. Off-campus activities will be scheduled during the first three weeks of classes. Changes to the scheduled "at-sea laboratories" may only be made in person with advanced notice and a compelling legitimate conflict or documented illness.

Grading Timeline

Final grades will be submitted per standardized university policies and procedures.

Course Schedule: A Weekly Breakdown

	Topics / Daily Activities	Learning Objectives	Readings and Homework	Deliverable/ Due Dates
Week 1	Course & syllabus overview, laboratory schedule, sea time books	USCG licensing requirements Sea time tracking	Blackboard slides, vessel sign-up sheets	In class
Week 2	Ancient and modern navigation, heights, depths and distances,	History of advanced navigation	Blackboard slides and online videos	
Week 3	Ancient charts, sextants and tools. Calc. distance and height	History of advanced navigational skills	Blackboard slides and online videos	
Week 4	20 th century navigation (Determining velocity, echo location & ancient RADAR, Radio directional finding, Sextants and ranges	Advanced navigational skills And the evolution of marine electronics	Blackboard slides and online videos	
Weeks 5-6	20 th century Soundings and LORAN-C, 21 st century Electronics-SONAR GPS, AIS, RADAR. Navigational formulae Charting Review-001A and 001B courses	History and evolution of navigation and electronics Understanding the technological advances in navigation from the 20 th to 21 st century	Blackboard slides and online videos	
Week 7	21 st Navigation Doubling the angle on the bow, Bow beam bearings, Danger bearings, Turn bearings, Emergency ranges/fixes, Sonar fixes. Radar fixes, Compass correction. Gyro and Magnetic compasses	Modern ship navigation Advanced charting. Understanding of electromagnetic fields and the effect on navigation. Understanding EM charges and the effects on electronic ship navigation		
Weeks 8	Tide table corrections. Current tables corrections. Set and drift problems and fixes.	Charting and Navigation proficiency Adjusting for tides and currents when navigating		

Week 9	USCG Lateral aids to navigation, Right of way. Damage control, heavy weather. Man-overboard recovery	Piloting skills for coastal water ways. Safety at sea. Navigation rules, collision avoidance.		
Weeks 10-14	USCG and USDHS Navigation Rules-International	Coast Guard licensing requirements, Boat handling, steering rules, lights, sounds and annexes.	USCG/USHLD Navigation and Steering Rules- (required text)	Dates to be determined during lecture weeks 1-3
Week 5-14 <u>Laboratories</u>	“Performance Boat I” “Skipper Preparedness” “Day Practical Sail” “Life-raft Instruction”	Practical laboratories at sea These will be scheduled the 1 st three weeks of classes.		
Week 15	Final review session	Full review of practical navigation and sailing theory learned in course.		Last day of regularly scheduled class for each section
Week 16 FINALS	Final Exam			Date/Time: Consult the USC <i>Schedule of Classes</i> at classes.usc.edu/ .

Additional Policies:

Due to safety considerations, students will not be permitted to participate in the sailing voyages without having participated in the on-campus lectures.

Special Needs Students are Welcome!

Please contact Capt. Lars P. Harding, Program Administrator to discuss accommodations

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in “SCampus” Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

USC Support and Advocacy (USCSA) – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu