

MST 218 Electronic Aids to Navigation Fall 2011
Saddleback College, Division of Advanced Technology and Applied Science

FACULTY INFORMATION

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2. COURSE INFORMATION

Name and Number

MST 218 Electronic Aids to Navigation

Ticket # 16150

Meeting time and place:

TAS 116

and OCSEC (Off Campus, Dana Point Harbor for Field Trips)

OC Sailing & Events Center, 34451 Ensenada Pl, Dana Point Harbor.

August 25 to December 15, 2011; 16 weeks every other week, 9 classes (including final exam)

See schedule page 5 for details on optional labs.

No class November 24, 2011 (Thanksgiving break)

Division of Advanced Technology and Applied Science (949) 582-4541

Recommended Preparation

MST 210 Coastal Navigation, MST 214A Intermediate Sailing or equivalent experience.

(basic charting standards will be reviewed during first weeks of class)

Prerequisite or Corequisite - None

Course Description

A study of the operation and function of electronic navigational aids as they are used on board a vessel at sea.

Includes GPS, autopilot, depth meter, chart plotter, and radar with hands on laboratory sessions practicing techniques for their operation. Students will be able to integrate the various instruments into a cohesive unit for safe navigation of a seagoing vessel.

Textbook

Adlard and Coles Book of Electronic Navigation

by Tim Bartlett ISBN 0-713-65715-4

Recommended Books

The Weekend Navigator: Simple Boat Navigation with GPS and Electronics (K)

by Bob Sweet ISBN 0-07-144901-9

The Radar Book 2nd Edition (K)

By Kevin Monahan ISBN 978-1-932310-36-8

GPS for Mariners

by Robert Sweet ISBN 0-070141075-9

How to Read a Nautical Chart

By Nigel Calder ISBN 978-0-07-137615-0

Boater's Bowditch

By Richard K. Hubbard ISBN 0-07-136136-7

Navigation Rules

USCG document, available hardcopy, interactive online or online PDF as well as an iPhone or iPad App

Required Materials/Supplies

Study guide/workbook and chart materials will be provided as part of materials fee. Books marked (K) in the Recommended list are included in the chart materials kit.

If student has a handheld GPS they should bring it to class, but Garmin 76 series GPS units will be available for checkout. Required paper plotting equipment will be discussed at first session.

Course Learning Objectives

Students will learn to operate a variety of marine electronic equipment including handheld GPS units, marine VHF radio, marine Radar, marine chart plotter with integrated GPS, use of personal computers for preplanning, uploading to marine GPS and route navigation backup. Students will explore emerging technology that has marine navigation applications such as smart phones, net books, and iPads. Students will understand power requirements and integration of marine electronics into boat electrical systems. Emphasis will be on pre planning a cruise, documenting electronic navigation during a cruise with paper charts and logs, and safe passage with regards to the Rules of Navigation.

Student Learning Outcomes

1. Explain the operation and function of a GPS unit.
2. Demonstrate the operation of electronic instruments: GPS, chart plotter, auto pilot and radar.
3. Understand basic principals of marine electrical systems that support Electronic Navigation systems.
4. Understand how the components of an electronic navigation system can be integrated using computer technology.
6. Interface an electronic navigation system with a computer.

Methods of Evaluations

Midterm, Final, class quizzes, instructor evaluation of student performance in labs and written lab work.

Topics Covered

History of marine navigation.

Basic marine electrical systems, AC, DC, power requirements and wiring practices, galvanic and stray current corrosion, lightning protection, electrical interference.

Basics of radio communications, receivers (i.e.: GPS) vs transceivers (i.e.: VHF, radar transponders), FCC rules and licensing requirements.

Use of handheld and stand alone GPS for navigation, integrating with paper plan/plot.

Use of marine radar for navigation and collision avoidance.

Use of personal computer software to pre plan cruise and upload to GPS.

Integrating depth sounder into cruise navigation while underway.

Discussion of emerging technologies becoming available to recreational boaters such as smart phones, data tablets, FLIR, AIS.

Safety Considerations

Student safety is paramount. Electrical systems in a marine environment are inherently dangerous if not operated properly and treated with respect. This is especially true of shore power connections to boats in the water. If a student is not sure how to operate, connect or disconnect power or equipment the instructor should be advised before action is taken. Safety at sea will always be our prime objective. Any safety concern should be brought to the immediate attention of the instructor. If it doesn't look/seem right, it probably isn't!

The instructor reserves the right to be the final arbiter of the appropriateness and ability of any student to participate in the "at sea" portions of lab work.

3. EVALUATION AND GRADING POLICY

Assessment

Grades will be based on attendance, lab performance, quiz performance, class participation, mid term and final tests, and instructor evaluation of students demonstration of skills as follows:

Attendance	10%
Lab	15%
Quizzes	10%
Mid term exam	15%
Final exam / project	25%
Skills demonstration	25%
	100%

Late Assignments:

Late assignments will be accepted up to the last lab/lecture day, December 8, 2011.

4. PARTICIPATION/ATTENDANCE

Students are expected to attend class regularly. Failure to attend class is taken into consideration in the assessment for grades.

Students who fail to attend the first meeting of class for which they are officially enrolled may be dropped by the instructor unless prior arrangement has been made with the instructor (policy)

Students who officially enroll in a class and never attend will be dropped by the instructor no later than the end of the tenth instructional day of the semester. (September 2, 2011) (policy)

Instructors may drop a student from class when he/she is absent for a total of six cumulative instructional hours. In no case, where the instructor has the option to drop a student, should the student presume he/she has been dropped unless the instructor drop has been officially verified by the Office of Admissions and Records (Calif. Ed. Code, Section 70902)

Use of electronic devices

Please no audible cellular phones or pagers. If you must leave the classroom to answer a call or page, please leave and re-enter as unobtrusively as possible. Electronic devices required for the completion of testing will be allowed.

5. COMMUNICATION

The class will use the Saddleback email system as the backbone for out of class communication. Assignments and class information will be posted on Blackboard. Other methods of communication that may be unique to personal circumstance will be considered by the instructor but not guaranteed.

6. ACADEMIC INTEGRITY

It is expected that students will do their own work required for evaluation in this class. In general, the instructor's policy will be aligned with the policy outlined on the Saddleback College Web site.

7. DROPPING THE CLASS

It is the student's responsibility to drop the class - failure to drop the class may result in a failing grade for the course. See the Saddleback College Web site for the critical dates. The tentative dates as of the writing of this syllabus are;

Drop with Refund by:	Sunday, 9/4/2011
Elect Pass/No Pass by:	Friday, 9/23/2011
Drop without 'W' Grade by:	Friday, 9/23/2011
Drop with 'W' Grade by:	Thursday, 11/3/2011

8. STUDENTS WITH DISABILITIES

Students with disabilities are eligible for special consideration for their projects and testing. Please notify your instructor if you are disabled or have special needs so that appropriate modifications can be made to your workload and to discuss if accommodations can be made for the "at sea" portions of the labs. If accommodations can not be made, alternative training experience will be considered. Please see the Saddleback College Web site for your rights and duties as a disabled student if this section applies to your situation. Failure to officially apply in writing along with the proper documentation from a medical professional will waive any rights to special consideration. Visit Special Services in the Student Services Center, Room SSC 113 for full information.

9 CLASS CONDUCT

Students are expected to conduct themselves with respect for the right of all members of the college community to teach and learn in a safe and academically stimulating environment. Student rules responsibilities and potential disciplinary action are outlined in the Board of Trustees policy. Violation of such rules shall constitute good cause for imposition of disciplinary action as provided by those rules and regulations (Calif. Ed. Code, Section 66300)

10. GRADE AND INSTRUCTIONAL RELATED GRIEVANCE

Official Board policy may be found on the Saddleback College Web site at
<http://www.socccd.org/board/boardpolicies.asp>

11. COURSE SCHEDULE (Bi Weekly 6:00PM to 8:50PM - 3 to 4 Hours depending on Lab)

Session 1 August 24 - Dana Point

Assess student background and skills. Lecture: a short history of marine navigation, how GPS system works. Basic Coastal Navigation using GPS

LAB: introduction to GPS handheld devices, review of paper chart plots.

Session 2 September 8- On Campus 116

Lecture: Basic Chart plotting review, new techniques. Intro to chart plotters.

LAB: Chart plotting exercises. GPS handheld devices orientation.

Session 3 September 22- Dana Point Boat Lab

LAB: GPS handheld devices navigation at sea, intro to dedicated chart plotter (PILGRIMAGE BOAT LAB)

Session 4 October 6- On Campus 116

Lecture: Introduction to Radar.

LAB: Pre Planning cruise using paper chart plot to upload data to handheld GPS. (begin final project)

Workbook: Radar, GPS Navigation (home study review)

Session 5 October 20- Dana Point Boat Lab

LAB: Radar operation and use at sea, (BOAT LAB and/or simulator software) chart plotter integration to Radar.

Lecture/Workbook: Antennas and Transmission Lines, Radiotelephone Operating Procedures, FCC Rules and Regulations, FCC Freq. Plan, Other Communication Services.

TAKE HOME MIDTERM - Covering all topics to date.

Session 6 November 3- On Campus 116

Lecture: Electronic Charting/Computer-Assisted Navigation

LAB: Hands on use of computer based navigation on laptops, iPhones and iPads. Continuing Cruise Plan

Workbook: Electronic Charting, Computer Assisted Navigation (home study)

MIDTERM DUE

Session 7 November 17- On Campus 116

Lecture: Computer Assisted Navigation part 2

LAB: Hands on use of all devices, Continuing Cruise Plan project

Session 8 December 1 - On Campus 116

Lecture: Depth Sounders

LAB: Orienting bathyscaphe data with paper and electronic charts.

Session 9 December 8- On Campus 116

Lecture: Putting it all together, simple to complex systems.

TAKE HOME FINAL + Cruise Plan project

Session 10 December 15 - Final Due

Note: Instructor will be available on an as needed basis for Charting Lab assistance on the off weeks Thursday evenings from 7-9PM in TAS 116.

12 FINAL EXAM:

Final exam will be completion of the Charting Project and an open resource take home exam.

13 ACKNOWLEDGEMENT OF RECEIPT OF SYLLABUS:

Signing in on the student attendance sheet shall constitute that the student has read and understands the policies outlined in this syllabus along with any elaboration provided by the instructor. The student agrees to adhere to the policies and procedures outlined. The instructor reserves the right to change the policies, procedures and course schedule to align with the needs of the students and the vagaries of the weather to insure a safe operation at all times.