

Massachusetts Maritime Academy

Coastal Navigation -MT 1221, Spring 2025

Instructors

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CREDITS

3: 2 - 50 min Lectures and 1 - 1 hr & 50 min Lab per week

COURSE INFORMATION

Description: This course introduces a student to the knowledge and practices necessary to carry out routine day to day navigational watchkeeping duties in a proper and safe manner. The student will be able to understand and read information from a chart; fix the ship's position in coastal waters; understand earth's magnetism; comprehend buoyage systems; and check and compare magnetic and gyro compasses, obtaining and applying compass error. In addition, the student will be introduced to the basic concepts and obtain an understanding of electronic navigation systems. Classwork is supplemented by practical chart plot exercises in weekly labs.

STCW Knowledge-Based Learning Objectives:

Completion of this course will demonstrate knowledge and understanding of the following STCW elements:

- OICNW-A1.02 Ability to determine the ship's position by use of landmarks
- OICNW-A1.02 Ability to determine the ship's position by use of aids to navigation, including lighthouses, beacons and buoys
- OICNW-A1.02 Ability to determine the ship's position by use of dead reckoning, taking into account winds, tides, currents and estimated speed
- OICNW-A1.06 Knowledge of the principles of magnetic and gyro-compasses

To satisfy these requirements, the minimum passing grade for the course is 70%.

COURSE CONDUCT

- Course conduct will be in accordance with the MMA regimental system. All Cadets shall wear the uniform of the day to each lecture class. The MMA honor code will be strictly followed.
- All students will soon be ship's officers. They will be addressed and treated as such.
- Reference shall be made to the syllabus / lecture and lab schedule for assignments. All students are expected to come to class prepared. **READ ASSIGNMENTS BEFOREHAND**
- Cell phone texting or calls are not permitted during class. **Cell phones *SHALL* be placed in silent mode and put away, in your bag or pocket at the beginning of class and remain away until the end of class. First offense of this policy will result in immediate dismissal from class and delivery of the cell phone to the Dean of Undergraduate Studies. Each offense thereafter will result in a reduction of your overall grade by one letter grade and immediate dismissal from class and delivery of the cell phone to the Dean of Undergraduate Studies. Use of smart phone calculators is not permitted.**
- Laptop computers are permitted in the classroom. However, if Internet surfing or use of social media is detected during class periods, laptop computer use privileges will be suspended.

- Only covered drinks will be permitted in the classroom. Absolutely no drinks will be permitted on desk top during lab periods. No food will be permitted in classrooms.

COURSE OUTCOMES and OBJECTIVES

As a result of completing Coastal Navigation and successfully passing the associated quizzes, tests, and examinations, Cadets will have demonstrated the ability to safely navigate in coastal waters through:

- Displaying knowledge of how to read and understand nautical charts and publications
- Demonstrating an ability to quickly and accurately plot Latitude and Longitude
- Exhibiting an aptitude to rapidly and precisely determine and plot courses; true and magnetic
- Showing the ability to calculate Speed/Time/Distance problems
- Proving an understanding of how to determine and apply magnetic Compass Error, Variation, and Deviation
- Presenting a proficiency in the skill of properly plotting various types of electronic and terrestrial navigation fixes
- Exhibiting the use of effective Dead Reckoning principles
- Revealing knowledge of how to accurately calculate the Geographic, Nominal and Luminous visibilities of lights, and
- Displaying proper plotting and use of RADAR navigation fixes

Further, after completing Coastal Navigation, Cadets should:

- Be familiar with and understand navigation terminology
- Understand information available on charts and in navigation publications
- Have developed the skill of using the tools of navigation
- Know they can keep their vessels out of danger when navigating in Coastal Waters by fixing their position through various techniques and making adjustments necessary to compensate for various sources of error, and
- Appreciate how piloting skills are used in industry

Grading of multiple assignments issued throughout the semester as well as the results of quizzes, tests and examinations will be used to determine satisfaction of these outcomes and objectives.

HOMEWORK

Homework will be turned in the **day** it is due by 1600. Late homework will **not be accepted, no exceptions**. I will be grading all homework, but only grading a few of your homework problems at random draw. For example, if your homework has 20 problems I might decide to grade only 10 out of the 20 so instead of your homework being 5 pts each I will grade 10 at 10 pts each. So, there will be no questions on which problems I will be grading, after I collect your homework I will at random pick the questions I will be grading in front of the class. This will be done by a random number app or pick the numbers out of a hat. It will be up to you to make sure you do all of your homework problems. If one of the problems I pick you didn't do, you will not receive credit. **You will also not receive credit if no work is shown.** In class when going over your homework one of you, by random draw from your classmates, may be asked to do a problem on the board. This will be one of the problems I didn't grade. To be fair once you have been chosen to do a problem your name will be put aside so you will not be chosen every time. There will also be times that I will not be able to finish the power point presentation and it will be your **responsibility** to review what does not get covered in the lecture.

CHEATING

Cheating will not be tolerated. Appropriate disciplinary action will be taken. A zero will be given for the respective quiz, plot, homework assignment, or exam. Don't do it! **Do not** write answers down that are not reflective of your work/plotting, you will not be given credit for the work unless it is supported by sound plotting.

RUNNING FIX QUALIFICATION

There will be a running fix qualification in this course. It will be under the discretion of the instructor which type of running fix will be used. This qualification is worth 5% of your final grade and you will only have one try.

GRADING POLICY

- In accordance with the Mass Maritime Academy academic policy, the minimum passing grade for Coastal Nav is 60%. However, as this course satisfies a portion of your STCW requirements for licensing, in order to receive credit for the knowledge-based components of STCW for this subject, it is necessary to obtain a grade of 70%.
- Those who receive a grade of 60-69% **must retake** Coastal Nav in order to satisfy their STCW requirements. Anyone receiving a grade below 60 satisfies no prerequisites or STCW requirements, and must retake the course to satisfy both.
- This course serves as a pre-requisite for Deep Sea Navigation (MT-2121), Rules of the Road (MT-2161) and Sea Term II.
- **Note:** A student who fails twice to receive a minimum C- grade will be dis-enrolled from the Marine Transportation degree program.
- Grades will not be scaled.
- The + / - system will be used.
- Grades will be averaged based upon the following percentage values:

Classroom Quizzes & Tests	15%	Lab Tests	15%
Classroom Assignments	15%	Lab Exercises	15%
Classroom Final Examination	15%	Lab Chart Final Exam	15%
Running Fix Qualification	5%		
Participation	5%		

Final Course Grading:

100 - 93% A	76.9 - 73% C
92.9 - 90% A-	72.9 - 70% C-
89.9 - 87% B+	69.9 - 67% D+
86.9 - 83% B	66.9 - 63% D
82.9 - 80% B-	62.9 - 60% D-
79.9 - 77% C+	Below 60% F

REQUIRED BOOKS & ACCESSORIES:

- DUTTONS 15th Edition
- BOWDITCH 2019 Ed. – available online *ONLY*
- Charts 12221-TR, 12354-TR, 13205-TR, and 18465-TR
- Chart # 1 13th Edition
- Plotting Equipment: 2 Navigation Triangles, Dividers (points and lead), and Pencils
- Plotting equipment, charts, and books can be purchased from the school bookstore in a package.

Calculators are to be brought to **every lecture class** throughout the semester.
Calculators, plotting tools, **all charts** are to be brought to **every lab** throughout the semester (unless specifically requested by the instructor not to).

ATTENDANCE

Since this is an STCW course, no allowance for unexcused absence can be made under Federal Law. Missing more than two (2) lectures classes or one (1) lab meeting for **ANY** reason will result in at least one full letter reduction of your final grade.

It is your duty to keep up with the material, and to arrange to make up any quizzes, tests or material missed ***in advance***. Make your arrangements beforehand, or a zero will be recorded for that work.

Lecture Assignments and Lab Exercises **will not be accepted for credit past their due date** so if missing class make arrangements to turn in assignment on time.

SPECIAL LIBERTY

If you need to take a special liberty from school this does not dismiss you from class automatically. This is an STCW course and I or your lab instructor, depending on what you will be missing, will have to approve your special liberty. You will also have to make arrangements to make up the missed class or lab. If we do not approve liberty this will count as an unexcused absent.

Mass Maritime Academy is committed to providing reasonable accommodations to students with documented disabilities. Students who believe that they may need accommodations in this class are required to contact ADA Coordinator:

Dr. Elaine Craghead, Asst. Dean
ABSIC 320
x5120 (Karen Nahigian)
ADAcompliance@maritime.edu
(We're here 8-4, Monday-Friday)

Thereafter, you must make me and your lab instructor aware of any determined accommodations so that they may be implemented within our classroom.

LAB INSTRUCTORS

Instructor: LT Edward Vacha	Office #321A HA	evacha@maritime.edu
Office Hours:		<u>by appointment</u>
Instructor: Mr. Gene Morrow	Office #322A HA	emorrow@maritime.edu
Office Hours:		<u>by appointment</u>
Instructor: Ms. Lisa Burke	Office #322A HA	lburke@maritime.edu
Office Hours:		<u>by appointment</u>

Our duty is to:

- guide you through the material,
- answer all your questions, e-mails, texts, etc.,
- be available should you need further explanation, and
- promptly return and comment on assignments, quizzes and tests.

It is your responsibility to:

- Come to class prepared to discuss the reading and subject matter for that day,
- Actively participate in classroom discussions and labs,
- Stop me at any point that you don't understand as I will be glad to go over it again, and
- Learn the material.

Your comprehension of the material can only come from your active involvement in the homework, reading assignments, and the lectures.

Do your own work. These are not group assignments, because when you are standing on the Navigation Bridge looking out the windows, you and you alone must process the information. Any indication of collaborative work (outside of advice) on assignments will meet with a zero.

It is our personal goal to see each and every one of you succeed with this material. If you feel you are falling behind or having trouble understanding some of the subject matter, **contact one of us before you get in over your head. We can only help you if you come to us.**

LESSON PLAN LECTURES – SPRING 2025

Class	LESSON	READ Duttons 15 th ed. <i>before lecture on</i>	READ Bowditch <i>before lecture on</i>
1	Course Intro & Navigation Introduction	Ch. 1	Arts. 100-102
2	Nautical Charts	Ch. 3, Art. 315-344	Art. 400, 424-425, 429-442
3	Plotting on a Chart–Direction & Distance	Ch. 8	Art. 106-107
4	LOPs and Fixes	Ch. 12, Art. 1200-1206, 1210, 1217-1218	Arts. 1011, 1013
5	Dist., Speed, Time		
6	Dead Reckoning	Ch. 9	Arts. 900-905
7	Running Fix	Ch. 12, Art. 1207-1208	Art 1012
8	Danger Bearings	Ch. 12, Art. 1216	Figure 1002(e)
9	Earth's Magnetism	Ch. 7, Art. 703-704	Art 802-803
10	Magnetic Variation	Ch. 7, Art. 705	Art. 828-829
11	Magnetic Compass	Ch. 7, Art. 701-702, 706-707	Art. 801
12	Deviation and Compass Error	Ch. 7, Art. 708, 709-711	Arts. 804, 829-830, Vol II Ch. 5
13	Deviation Compensation, Tables, Interpolation	Ch. 7 Art. 712	Arts. 805-809 Vol II Art. 201
14	Gyro Compass and Gyro Error	Ch. 7 Art. 715-718	Arts. 818-821
15	Other Directional Devices	Ch. 7, Art. 719	Arts. 822-827
16	Aids to navigation (ATONS)	Ch. 6, Art. 600-602, 605-613, 622-623	Arts. 700-710, 711, 721, 725-732
17	Buoy Systems	Ch. 6, Arts. 603-604, 624-626	USCG Pamphlet Arts. 723-739
18	Lights	Ch. 6, Art. 614-617	Arts. 712-719
19	Navigation Publications	Ch. 5	Ch. 6
20	Chart Datum & Accuracy		Arts. , 200-204, 210 309-310, 427-428
21	Chart Projections	Ch. 3, Art. 300-314	Arts. 401-419
	Review		
	TEST DATES WILL BE DETERMINED BY CLASS PROGRESS AND WILL BE ANNOUNCED		"Art." Means article number in the text

LESSON PLAN LABS – SPRING 2025

Lab	Subject
1	Geographic Coordinates READ Duttons Ch.2, Bowditch Arts. 104-105, 108 <i>Movie: The Search for Longitude</i>
2	Plotting Instruments READ Duttons Ch. 8 <i>Exercise plotting Lat., Long., Dir., & Dist. Chartlet to be provided</i>
3	Position Fixing <i>Exercise Chart 12354TR</i>
4	Dead Reckoning Plot <i>Exercise Chart 18465TR</i>
5	Running Fix Plotting <i>Exercise Chart 13205TR</i>
6	Running Fix Plotting <i>Exercise Chart 12354TR</i>
7	Magnetic Variation, Bearings, Piloting <i>Exercise Chart 12221TR</i>
8	ENL Exercise #1 Chart 18465TR
9	Magnetic Deviation and Gyro Compass <i>Exercise Chart 13205TR</i>
10	ENL Exercise #2 Chart 12354TR- <i>might change due to space</i>
11	Light ranges READ: Dutton's Ch. 6, Art. 618-621, Bowditch Art. 720 <i>Exercise Chart 13205TR</i>
12	Chart Plot - Final Exam Practice <i>Chart 12221</i>
13	CHART PLOT FINAL
	TEST DATES WILL BE DETERMINED BY CLASS PROGRESS AND WILL BE ANNOUNCED