

Massachusetts Maritime Academy

ELECTRONIC NAVIGATION

COURSE MT 3221 (Credits - 4)

Fall Semester Academic Year 15-16

1. Instructors

Professor: Dr. James J. Fitzpatrick, USCG MASTER UNLIMITED

Assistant Professors: CAPT Kurt DeCicco; Mr. Andrew Perone & CAPT Dan Lunny

OFFICE: 3rd Deck Bresnahan Building Room C303

I can be reached by telephone at extension 2109 or in the Lab at 2148. If you can't reach me at the above number you may leave a message and I will return the call. If you need to reach me in an emergency please call my cell phone number: 508-736-5113. I can also be reached via email at jfitzpatrick@maritime.edu

Mass Maritime is committed to providing reasonable accommodations to students with documented disabilities. Students who believe they may need accommodations in this class are required to contact Dr. Fran Tishkevich, Director of Disability Compliance, within the first two weeks of class. Dr. Tishkevich can be reached at ftishkevich@maritime.edu and at ext 2208.

MMA Health Services realizes that students may encounter situations which could impede their academic, personal and social development and success. Counseling services are designed to help students address these concerns, increase their self-awareness and empower them to manage challenging areas in their lives. To schedule a confidential appointment please call Health Services.

2 Catalog Description

Pre-requisite: NONE

Knowledge of the Morse code and correct procedures in transmitting and receiving messages by Morse light are taught in this course. Students will know the flags of the International Code of Signals and the significance of the single-letter signals. They will know the procedures set out in the International Code of Signals and how to make use of that publication. They will also know the procedures to use in radiotelephone communications and be able to use radiotelephones, particularly with respect to distress, urgency, safety, and navigational messages. The radio communications requirements of the SOLAS Convention, as amended, and the procedures for distress, urgency, safety, and navigational messages in accordance with chapter N IX of the Radio Regulations will be known. Students will have knowledge of the basic theory of electronic navigational aids and the use of appropriate instruments. They will

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know the fundamental differences between the various systems and the methods of using these systems to obtain the ship's position. In addition, the students will know the basic electronic theory of, and be sufficiently trained in, the operation of GPS, AIS and INS to handle the instruments properly and apply information correctly. The students will know the general principles of echo-sounders and speed logs. In addition, they will be familiar with methods of recording and displaying the information. Students will appreciate the danger of exclusive reliance on information gained from instruments.

3. Required Texts

- T1- The American Practical Navigator; Bowditch, Pub. No. 9
- T2- Introduction to GMDSS, J. Patrick Allen, Mercomms unlimited
- T3- International Code of Signals, Pub. No. 102
- T4- Marine Radionavigation and Communications, Monroe and Bushy, 1998

4. Supplementary Reading

As per STCW'95 submittal.

Blinking Light Software – www.hawsepipe.net

5. Class Format

Simulation, Critical Thinking and Lecture with participative group discussions. Class participation includes: class attendance, attentiveness, good behavior and respect for classmates and the instructor.

6. Objectives

To better appreciate the need for an understanding of marine electronics communications

Learning Outcomes

Upon successful completion of the course the student will be able to:

- Transmit and receive Morse code at 4 WPM.

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- Transmit and receive the flag messages from the International Code of Signals.
- Follow procedures for the use of VHF radiotelephone communications during distress, safety, urgency and routine situations.
- Demonstrate an understanding of basic electronic theory as applied to navigational equipment.
- Appreciate the danger of over-reliance on electronic instruments.

Additionally the following is covered in this course

Demonstrate knowledge and understanding of the following STCW elements:

GMDSS-11.14 use of the International Code of Signals and the IMO Standard Marine Communication Phrases

OICNW-A1.04 Ability to determine the ship's position by use of electronic navigational aids

OICNW-A8.1 Ability to use the International Code of Signals

OICNW-A8.2 Ability to transmit and receive, by Morse light, distress signal SOS

OICNW-A8.2 visual signalling of single-letter signals as also specified in the International Code of Signals

7. GMDSS Competencies

There will be 2 chances to demonstrate competencies on each piece of equipment set forth by the US GMDSS Task Force.

A student that passes the competencies on the first attempt will receive a mark of 100. A student that passes on the second attempt will receive a mark of 75.

- * **Should a student fail to demonstrate competency during the second attempt on any piece of equipment s/he will receive a zero (0) for that competency and may fail the course.** There will be no exceptions made to this policy.

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- * Make-up competencies will be scheduled by appointment only. A student that fails to make up a competency by **1000 December 11, 2015** will receive a failing grade for the course.
- * **All Labs must be completed** before a student will be allowed to assess on GMDSS equipment. If you have not made up a lab prior to the assessment you will need to schedule a time to complete the lab prior to an assessment.

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8. GRADING POLICY

A. Grades are determined by the average of percent achieved. Grades will not be scaled.

Grades will be averaged by the following percentage values:

STCW LAB PRACTICAL COMPETENCIES	25%
EXAM #1:	20%
EXAM #2:	20%
EXAM #3	20%
QUIZZES	15%

B. The following is a breakdown of the final course grading:

90.0 - 100	A
87.0 – 89.9	B+
83.0 – 86.9	B
80.0 – 82.9	B - minus
77.0 – 79.9	C+
73.0 – 76.9	C
70.0 – 72.9	C- minus
67.0 – 69.9	D+
63.0 – 66.9	D
60.0 – 62.9	D- minus
Below 60.0	F

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- C. A score of 70% is required for passing the Flashing Light examination. A score below 70% will result in no issuance of a Flashing Light Certificate. The Flashing Light Competency is valid for 1 year after issuance of the certificate. This is as per the National Maritime Center rules for STCW competency in flashing light.

10. CHEATING

- A.. Cheating will not be tolerated and will incur a zero.

11. ACADEMY STANDARDS AND CLASSROOM DECORUM

- A. At all times in the classroom, every cadet will observe the standards of uniform dress and personal appearance as specified by the Academy regulations. Students will come to attention when any officer enters the classroom or laboratory. The officer will then give the command "seats please" at which time you may be seated.
- B. Cell phones, drinks (Including water) and food of any kind are not allowed in the classroom or GMDSS laboratory. Cell phones may be kept in your backpack and on silent or off mode. Texting is prohibited in lab and class.
- C. A student displaying disruptive or disrespectful behavior of any kind, as determined by the professor or lab assistant, will be asked to leave the classroom and result in an absence from that day of class as well as receive cadet disciplinary action.
- D. A student late for class due to their poor time management will be charged with half an absent. Meeting with COMCAD does not give you a free pass to be late for class.
- E. A student who chooses to miss a scheduled makeup exam or lab forfeits their right to another makeup exam or lab for the semester, unless under, extraordinary circumstances, the instructors make an exception. The semester ends the minute the final exam scheduled period is over.
- F. Quibbling will not be tolerated.
- G. Any student more than 5 minutes late for class or lab will not be permitted into the class or lab and will incur an absence for that day. The time standard used for course meetings is that of the Atomic Clock in Colorado. Time ticks are available on 5, 7.335, 10 15 and 20 MHz from the GMDSS live station.

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12. Attendance Policy

ATTENDANCE AT ALL CLASSES IS MANDATORY. Unauthorized absence will not be tolerated. Disciplinary action and/or grade point reduction will be administered to repeat offenders. Class absence due to mandatory academy obligations (watch, firefighting, returning late from sea etc.) will be counted for STCW purposes as an absence (5 absences results in course failure). Absences due to serious illness, team movements and Academy sanctioned field trips may result in an STCW disqualification from the course and the student will need to repeat the course if the absences total five (5). Choose your absences wisely.

Authorized absences should be reported to me ***prior*** to the missed class or laboratory, preferably by email. Make-up examinations for authorized periods of absence will be scheduled during a mutually agreed upon time.

NOTE: Examinations, quizzes and competencies missed as a result of an unauthorized absence will receive a grade of ZERO.

13. Syllabus Changes

The syllabus and course schedules are tentative and may be adjusted as required to meet the goals and objectives of the course and the Academy. Notice of changes will be made to students and the Academy as soon as possible.

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14. COURSE OUTLINE AND SCHEDULE

CLASS MEETINGS/LESSON TOPICS

1. Course Overview – Course Policies
2. Pub 102 - International Code of Signals
3. Signaling
4. Signaling
5. Signaling
6. Signaling
7. Signaling
8. Signaling Quiz
9. Basic Electrical and Radio Theory
10. Basic Electrical and Radio Theory
11. Basic Electrical and Radio Theory
12. Basic Electrical and Radio Theory
13. Basic Electrical and Radio Theory
14. Basic Electrical and Radio Theory
15. Basic Electrical and Radio Theory (Communication Basics)
16. Review for Examination 1 Communication Basics
17. Examination 1
18. Navigation Systems – eLoran, backup to GPS
19. Navigation Systems – eLoran, backup to GPS

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20. Navigation Systems – GPS
21. Navigation Systems – GPS
22. Navigation Systems – DGPS
23. Navigation Systems - DGPS
24. Navigation Systems – Hydro sonic Navigation Systems Echo Sounder
25. Navigation Systems – Hydro sonic Navigation Systems Echo Sounder
26. Navigation Systems – Hydro sonic Navigation Systems - Speed Logs
27. Navigation Systems – Vessel Control Systems - Fluxgate Compass Gyro Compass
28. Navigation Systems – Vessel Control Systems, Steering
29. Navigation Systems – Vessel Control Systems, Steering
30. Automatic Identification System (AIS)
31. ECDIS
32. Examination 2
33. Communications Principles – GMDSS Introduction and Overview
34. Communications Principles – GMDSS
35. Communications Principles – GMDSS Rules and Regulations
36. Communications Principles – GMDSS Rules and Regulations
37. Maritime Education Interactive DVD
38. Review for Examination 3
39. Examination 3

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15. LABORATORY OUTLINE AND SCHEDULE SECTIONS 11

LABORATORY TOPICS BY CLASS MEETINGS

LAB	Day	Date	Lesson Topic
01.	MON	09/07	Morse Code And Signal Flags
02.	MON	09/14	Morse Code And Signal Flags
03.	MON	09/21	Morse Code And Signal Flags
04.	MON	09/28	Basic Electronics Test Equipment VOM SnapKit
05.	MON	10/05	GPS 90
06.	MON	10/19	VHF SCT, SART and EPIRB Familiarization
07.	MON	10/26	VHF SCT, SART and EPIRB Competency Practice
08.	MON	11/02	VHF SCT, SART and EPIRB Competency Examination
09.	MON	11/09	NAVTEX Equipment Familiarization
10.	MON	11/16	NAVTEX STCW Competency Practice
11.	MON	11/30	NAVTEX STCW Competency Examination
12.	MON	12/07	STCW Competency Examinations- 2 nd Attempts
	FRI	12/11	Last day to complete STCW Competency Examinations

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16. LABORATORY OUTLINE AND SCHEDULE SECTIONS 51

LABORATORY TOPICS BY CLASS MEETINGS

LAB	Day	Date	Lesson Topic
01.	FRI	09/18	Morse Code And Signal Flags
02.	FRI	09/25	Morse Code And Signal Flags
03.	FRI	10/02	Morse Code And Signal Flags
04.	FRI	10/09	Basic Electronics Test Equipment VOM SnapKit
05.	FRI	10/16	GPS 90
06.	FRI	10/23	VHF SCT, SART and EPIRB Familiarization
07.	FRI	10/30	VHF SCT, SART and EPIRB Competency Practice
08.	FRI	11/06	VHF SCT, SART and EPIRB Competency Examination
09.	FRI	11/13	NAVTEX Equipment Familiarization
11.	FRI	11/20	NAVTEX Equipment Competency Practice
10.	FRI	12/04	NAVTEX STCW Competency Examination
12.	FRI	12/11	STCW Competency Examinations- 2 nd Attempts
*****	FRI	12/11	Last day to complete STCW Competency Examinations

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TO: CAPT. JAMES J. FITZPATRICK EDD

FROM: Enrolled Student

RE: Receipt of Course Documents

I hereby acknowledge that I am in receipt of the Course Syllabus and the Course Schedule for this course. I further acknowledge that CAPT Fitzpatrick has explain the syllabus and course schedule during class and that I have read and understand all sections including class policies.

I acknowledge that I have taken and passed the required pre-requisite course listed below:

- None for this course

NAME: (print) _____

SIGNATURE: _____

STUDENT ID NUMBER _____

CLASS: _____

DATE: _____