

Massachusetts Maritime Academy
INTEGRATED NAVIGATION (MT-2225)

COURSE: MT-2225 (CREDITS: 4)

COURSE LEVEL: Undergraduate

Professor:

Office:

Phone:

Mobile:

Email:

Department: Marine Transportation

Class Location & Time

Section	Location	Day	Time

Course Description

Integrated Navigation (MT-2225) aligns with the criteria for Training, Certification, and Watchkeeping (STCW) and the United States Coast Guard. This course prepares students for ARPA and Radar knowledge-based assessments. Upon successful completion, students will:

- Choose an appropriate mode of display.
- Select plotting graphics control suitable to prevailing circumstances and conditions.
- Properly use operational alarms.
- Acquire and track targets presenting potential collision threats.
- Use equipment information to take early, decisive actions to avoid close-quarters situations.

Skills and Knowledge Gained:

- Extract critical target information such as:
 - True Course
 - True Speed
 - Closest Point of Approach (CPA)
 - Time to CPA
 - Target Relative Motion and Speed
 - Identify dangerous targets
 - Establish desired CPA through course and speed adjustments
 - Evaluate how actions affect other vessels/targets

Students will understand the limitations of automatic acquisition and tracking systems and operational alarms, as well as factors influencing ARPA accuracy. This course meets USCG ARPA endorsement requirements.

Course Requirements & Prerequisites

This four-credit-hour course consists of both simulation and theory. Classes meet once a week for 3 hours and 50 minutes throughout the semester. Prerequisites include:

- **Coastal Navigation (MT-1221)**
 - **Navigational Rules of the Road (MT-2161)** (can be taken concurrently)
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Teaching Facilities and Equipment

Classes and labs are held in the Integrated Navigation Laboratory (Harrington Building, 3rd Floor). Materials and assignments are delivered via MMA's multimedia platform and Blackboard. In case of a health crisis requiring remote learning, classes will transition to a prearranged online platform.

Case Study Presentation

Case Study Presentation

Inductive reasoning has emerged as an exceptionally effective learning approach, particularly as students tend to grasp concepts better when applied to real-life situations. To enhance problem-solving and analytical skills, every student will be allocated a unique case study. Through scrutinizing the incident or accident, students will subsequently present their findings to the class. This exercise aims to foster the development of these essential skills. During the presentation, each group is expected to address the following aspects explicitly:

- The underlying issue or problem
- The sequence of events leading to the problem
- Crucial factors and pivotal events
- Extracted lessons and insights
- Formulation of a recommendation

In conjunction with the presentation, the group is required to compose a concise 4-page report, approximately 1000 words in length. This report should succinctly encapsulate the essence of the presentation and provide comprehensive coverage of the five aforementioned facets. Notably, both the presentation and the written paper must adhere to proper referencing guidelines, preferably following the APA format. Additionally, both the report and the presentation are subject to editing and validation by the writing resource center before final submission.

Classroom Policies

In-person:

- Wear the uniform of the day (commuters: appropriate attire).
- Eating, drinking, and tobacco use are prohibited.
- Cell phones are not allowed; personal computers/tablets may only be used for course material.
- Violations (e.g., social media use) may result in a report or removal from class.

- Cheating is strictly prohibited and will result in disciplinary action, including potential reporting to the Honor Board.

Remote Learning Guidelines

In the unlikely event that our learning platform transitions to online or remote instruction, students are required to adhere to the following measures to maintain a productive learning environment:

- **Mute Microphones:** Keep microphones muted to prevent feedback and background noise.
- **Minimize Disruptions:** Avoid interruptions and refrain from speaking over the instructor.
- **Dress Code:** Wear appropriate attire during all online sessions.
- **Prohibited Activities:** Eating, tobacco use, and browsing unrelated internet content are not allowed during class.

Note: If remote learning is implemented, lab makeup sessions will be prearranged to ensure all course requirements are met.

Learning Objectives

Students will complete practical and written assessments covering STCW radar and ARPA elements, including:

- Position fixing (bearings, ranges, tangent bearings).
- Collision risk determination (crossing, meeting, overtaking situations).
- Safe navigation under blind pilotage techniques.
- Radar/ARPA setup, maintenance, and interpretation of information.
- ARPA operations, including identifying false echoes and other errors.

STCW Radar Assessments

These assessments will be conducted during regular class and lab meetings. Students who are absent or fail an assessment will have one opportunity to make it up at the end of the semester.

Failure to pass all assessments will result in failure of the course.

STCW RADAR and ARPA Assessments

OICNW Assessment Code	Assessment Description
1-2B	Position by two ranges
1-2C	Position by tangent bearings
3-1A	Power up
3-1B	Switch Display modes
3-1C	False echoes sea return etc.
3-1D	Determine Range and Bearing
3-1F	DRM SRM CPA TCPA

3-1G	Detect speed and course change
3-1H	Calculate C/C to control DRM
3-1I	Change speed for DRM
3-1J	Determine Tcse and speed of contacts
3-1K	Parallel Index
3-1E	Determine risk of collision
3-2A	Set up and maintain an ARPA display
3-2B	Manual target acquisition
3-2C	Establish an exclusion area
3-2D	Set vector characteristics
3-2E	Designate targets
3-2F	Cancel targets
3-2G	Target history
3-2H	Establish CPA and TCPA
3-2I	Establish alarm area
3-2J	Trial Maneuver
3-2K	Switch stabilization modes
3-2L	Navigation lines
3-2M	Determine set and drift

Learning Disabilities

MMA accommodates students with documented learning disabilities. Contact Assistant Dean Elaine Craghead (x5120 or ADAcompliance@maritime.edu) for assistance. Visit the Academic Resource Center (ABS 320) during business hours (M-F, 0800-1600).

Sexual Harassment and Misconduct

MMA prohibits sexual misconduct, including harassment, assault, and stalking. To report incidents or seek confidential support, contact the Title IX Coordinator listed on the school's website.

Examinations, Grading, and Attendance

This STCW course requires a minimum passing grade of 70%. Regular tests, assignments, and the final exam contribute to the grade. Failure to pass all assessments results in course failure.

Grading Breakdown:

Assignments & Quizzes	25%
Presentation	15%
Exams	60%
	100%

Grade Range

A	93.0-100
A-	90.0-92.9
B+	87.0-89.9
B	83.0-86.9
B-	80.0-82.9
C+	77.0-79.9
C	73.0-76.9
C-	70.0-72.9
D+	67.0-69.9
D	63.0-66.9
D-	60.0-62.9
F	Below 60

Attendance is mandatory. More than four hours of unexcused absences will result in an "F" grade. Absences for valid reasons (e.g., medical, legal) must be documented.

Syllabus Changes

The syllabus is subject to change to meet course objectives. Students will be informed promptly of any changes.

Required Textbooks and References

Radar And Arpa Manual by A.C. Boyle and W.O. Dineley

Radar Navigation and Maneuvering Board Pub 1310 by National Imagery and Mapping Agency
