New Undergraduate Course Proposal Form (Draft)

Course Title: Integrated Navigation I

Sponsoring Department: Marine Transportation

Class hours per week: Two **Simulation hours per week:** Two

Number of credits: Four

Will the course be required or an elective: X Required ☐ Elective

What students is the course intended for (indicate major(s), year class, etc.):
MT, Third Class

General Education requirement course will fulfill (if applicable): _____

Projected enrollment: 50-70 **Proposed section cap:** 8 - Simulation is limited by STCW

Frequency of offering (check all that apply):

X Fall ☐ Spring ☐ Every year, semester TBD ☐ Alternate years

☐ Other _____

Course prerequisite(s) and/or co-requisite(s): X Yes ☐ No

If yes, list applicable prerequisite(s) and/or co-requisites (course number(s) and title(s))
Co-requisite MT-2161 Rules of the Road

STCW Elements:

STCW elements (check all that apply): ☐ None X Knowledge X Practical

If STCW elements are included, list the associated assessments:

- OICNW-A2.5 Knowledge of blind pilotage techniques
- OICNW-A3.2 Ability to operate and to interpret and analyze information obtained from radar
- OICNW-A3.2 detection of misrepresentation of information, false echoes, sea return, etc., racons and SARTs
- OICNW-A3.2 application of the International Regulations for Preventing Collisions at Sea, 1972, as amended
- OICNW-A3.2 plotting techniques and relative- and true- motion concepts

- OICNW-A3.2 parallel indexing

- OICNW-3-2A Set up and maintain radar display
- OICNW-3-2B Switch display modes
- OICNW-3-1C Identify false echoes, sea return, racons and SARTs
- OICNW - A3.1 Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA)
- OICNW - A3.2 factors affecting performance and accuracy
- OICNW - A3.2 setting up and maintaining displays
- OICNW - A3.2 detection of misrepresentation of information, sea return
- ICNW - A3.2 range and bearing; course and speed of other ships; time and distance of closest approach of crossing, meeting overtaking ships
- OICNW - A3.2 identification of critical echoes; detecting course and speed changes of other ships; effect of
  changes in own ship's course or speed or both
- OICNW - A3.2 application of the International Regulations for Preventing Collisions at Sea, 1972, as amended
- OICNW - A3.2 plotting techniques and relative- and true- motion concepts
- OICNW - A3.2 parallel indexing
- OICNW - A3.3 Principal types of ARPA, their display characteristics, performance standards and the dangers of over-reliance on ARPA
- OICNW - A3.4 Ability to operate and to interpret and analyze information obtained from ARPA, including:
- OICNW - A3.4 system performance and accuracy, tracking capabilities and limitations, and processing delays
- OICNW - A3.4 use of operational warnings and system tests
- OICNW - A3.4 methods of target acquisition and their limitations
- OICNW - A3.4 true and relative vectors, graphic representation of target information and danger areas
- OICNW - A3.4 deriving and analyzing information, critical echoes, exclusion areas and trial maneuvers

Learning outcomes:

Upon completing the INTEGRATED NAVIGATION I course, students will gain the necessary skills to operate the Radar and ARPA competently. In addition, students earn a certificate upon successfully graduating from the Marine Transportation program.

Successful Students shall demonstrate a proficient understanding of the following areas:

- Equipment limitation
- Maintaining an appropriate display
- Contact collision avoidance evaluation
- Application to COLREGS
- Utilizing equipment for effective withstanding
- Selecting plotting graphics controls suitable to the circumstances
- Making appropriate use of operational alarms
- Acquiring and tracking targets that present a potential threat of collision
- Extracting the information needed on course, speed, and closest point of approach
- Being able to take early action and prevent a close-quarters situation
- Limiting the over-reliance on equipment
- Principles of Radar Navigation
- Plotting target's echo to determine target information and collision avoidance
- Discern potential errors of interpretation
- Selecting operation settings and alarms for route monitoring
- Navigational calculations and position fixing

● Selecting safety parameters
● ARPA and AIS functions
● Utilizing equipment to determine tides and currents information

List the specific course outcomes: SEE ABOVE

Describe how the Course Outcomes map to Program and Institutional Outcomes:

The main goal of the course is to combine two existing USCG and IMO approved courses while continuing to meet the mandatory minimum standards of competence for Officers in Charge of a Navigational watch (OICNW). The course will focus on maintaining safe navigation with modern integrated bridge systems and will provide training in the use of RADAR, ARPA, and AIS. The student will learn the methods of target acquisition, determining the position of the ship, and analyzing and applying the resources of the integrated bridge to make and manage proper command decisions. Successful completion of the course will result in the students receiving the required certifications leading to licensing as a third mate.

Course description: *Provide a brief description of the course (3-4 sentences), suitable for inclusion in the college catalog.*

The intent of the course Integrated Navigation I is to seamlessly combine the instruction and certification of Marine Radar detection systems, Automated Radar Plotting Aids (ARPA) and Automated Information Systems (AIS). With the advancements in technology, modern ships make use of an integrated navigation system into which multiple sensors and positioning equipment feed. To meet the needs of the industry now trains cadets using the Wartsila Navi-Sailor 5000 DNV certified Integrated Navigation simulation platform.

Resources required:

Proposed staffing requirements:
8 - 3 credit sections = 2 full load faculty

Space/room requirements:
One classroom for lecture and the Wartsila Integrated Navigation Simulation system.

Technology/specialized equipment requirements:
Wartsila Integrated Navigation Simulation system.

Potential impact(s):
Describe any potential impacts the new course may have on other courses, programs, departments, or divisions.

Will the new course replace an existing course in the curriculum: X Yes ☐ No

If yes, list the course(s) it will replace:

Integrated Navigation I will replace Radar and ARPA.

Will the new course potentially influence enrollment in other courses: ☐ Yes X No

If yes, describe the potential course enrollment impact

Describe any other potential impact(s)

Course Justification (provide a rationale for this new course):

Required for USCG Third Mate license.

Course syllabus (attach a draft syllabus that includes topics to be covered with general schedule, required textbook(s) and other required course materials, grading scheme, etc.)

Massachusetts Maritime Academy

INTEGRATED NAVIGATION COURSE:
MT-XXXX (CREDITS: 3) TBA
COURSE LEVEL: UNDERGRADUATE

Professor TBA
Office TBA#
Phone
Mobile
Email email
Department Marine Transportation

Class Location & Time

SECTION	Location	DAYS	TIME

Course Description
Integrated Navigation (MT-xxx) meets the criteria for Training, Certification, and Watchkeeping (STCW) and United States Coast Guard. This course is designed to meet all ARPA and Radar knowledge-based assessments and the Thirty-six performance-based assessments, which form part of the requirements for Officer in Charge of a Navigation Watch. Students who successfully complete the course will be able to:

- choose an appropriate mode of display
- select plotting graphics control suitable to the prevailing circumstance and condition
- proper use of operational alarms
- acquire and track targets that present a potential threat of collision
- aid the operator in gaining target information to better assess the situation and safe navigation
- use the information from the equipment to help the operator take early and decisive actions to prevent close quarters situations.

The operator should be able to extract the following information target:

- ♦ True Course
- ♦ True Speed
- ♦ Closest Point of Approach
- ♦ Time target will be at CPA
- ♦ Target relative motion
- ♦ Target relative speed
- ♦ Identify dangerous targets
- ♦ Establish a course and speed for the desired CPA
- ♦ Establish how the desired course change will affect other vessels/ targets

Students will be aware of the dangers of over-reliance on automatic acquisition and tracking of targets and operational alarms. They will also be aware of factors (including errors in the course and speed inputs) that may affect the accuracy and the correct functioning of the ARPA. This course satisfies the requirements for a USCG ARPA endorsement

Course requirements & prerequisites
This is a three-credit-hour course. The prerequisites for this course are Navigational Rules of the Road (MT-2161), Deep Sea Navigation (MT-2121), Algebra and Trigonometry (SM-1111); additionally, cadets must comprehend, read and write English (HU1111). The course meets for two hours and fifty minutes once a week for a combination of theory and simulation.

Teaching Facilities and Equipment
Lecture and laboratory will be hosted in the Integrated Navigation Laboratory, located on the third floor of the Bresnahan Building. Course material and assignments will be delivered through MMA's multimedia and Blackboard. If the present health crisis deteriorates and requires remote learning, meetings would revert to a prearranged online platform.

Case Study Presentation
Inductive reasoning has proven to be a very effective method of learning. Most students learn better through real-life scenarios. Each student will be assigned a case study. Students will analyze the incident/ accident and present their findings to the class. This exercise is to designed help build upon the students' problem solving and analytical skills. During the presentation, each group should ascertain the following:

1) The issue/ problem
2) Events leading up to the problem
3) Key factors and event
4) Lessons learned
5) Make recommendations

Students shall compose a 4-page report (1000 words). The report should summarize your presentation and should identify the five topics listed in the previous paragraph.
Note: Both presentation and paper shall be properly referenced (APA format preferred)

Classroom Policies

- Cadets will wear the appropriate uniform of the day in lecture classrooms. Commuter students should wear appropriate clothing.
- Eating, drinking, or the use of tobacco products is prohibited from all classes.
- The use of cell phones is disallowed; however, personal computers or tablets are permitted ONLY for course material. If students are caught using their cell phones, browsing social media, or browsing the inappropriate website, they will be placed on report, and or evicted from class. If a student was to be justifiably evicted, they will not receive credit for that day.
- Cheating will not be tolerated and immediate disciplinary action will be taken against the student. Disciplinary action for cheating violation may include a grade of ZERO or their actions reported to the Honor- board committee.
- Please keep the computer microphone muted, to avoid disruption from sound feedback, interference, and background noise.
- Avoid being disruptive and do speak over the instructor.
- Cadets shall wear the appropriate clothing.
- Eating and the use of tobacco products are prohibited from all lectures.
- The use of cell phones are disallowed; however, personal computers or tablets are permitted
- During lectures, students should avoid browsing internet content not related to the subject of discussion.

Learning Objectives

STCW RADAR assessments. These Assessments will be conducted during regular class/lab meetings. In the event a student is absent for the assessment or fails the assessment, a second opportunity will be given as a make up at the end of the semester. Failure to pass every assessment will result in full course failure.

Each individual will demonstrate their knowledge and understanding of RADAR through the following STCW elements through practical demonstration and written examination:

- OICNW-A2.5 Knowledge of blind pilotage techniques
- OICNW-A3.2 Ability to operate and to interpret and analyze information obtained from radar
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Learning Disabilities

Massachusetts Maritime Academy, upon request, accommodations to students with documented learning disabilities. The ADA Coordinator, Asst. Dean Elaine Craghead evaluates the documentation provided, determines appropriate services, and is available to discuss accommodations with students. The Disability Resources office is located in the Academic Resource Center, ABS 320. Students can drop in during normal business hours, M-F 0800-1600, or call x5120, or email ADAcompliance@maritime.edu.

Sexual Harassment and Misconduct

Our school is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibit discrimination based on sex. Sexual misconduct including harassment, domestic and dating violence, sexual assault, and stalking are also prohibited at our school.
Our school encourages anyone experiencing sexual misconduct to talk to someone about what happened, so they can get the support they need and our school can respond appropriately. If you wish to speak confidentially about an incident of sexual misconduct, want more information about filing a report, or have questions about school policies and procedures, please contact our Title IX Coordinator, which can be found on our school's website.

Examinations Grading and Attendance

Integrated Navigation (MT-xxxx) is an STCW knowledge-based course requiring a minimum passing grade of 70%. If students are unable to achieve the mentioned passing grade, it may result in failure of the course.

Regular tests on lecture material, reading assignments, PowerPoint® presentation notes, and classroom handouts will be administered. You are expected to complete all assigned reading and are accountable for any information found in the lecture material, reading assignments, PowerPoint® presentation notes, and classroom handouts. The final examination will be held during the designated exam time and day of final exam week. *There will be NO early or late final examinations for any reason.*

Final course grades will be awarded as listed below. *To receive the USCG-approved ARPA certificate a minimum of 70% on the theory final exam and a P (pass) on all of the operations assessments must be achieved.

Absence for medical court or legal obligation, the varsity is permitted however, students are responsible for the course material. Disciplinary action may be taken for unauthorized absences **and** ***anyone who has more than four class-long, unexcused absences will receive an "F" grade for the COURSE.***

Final Grade Computation:

Exams	60%
Presentation	10%

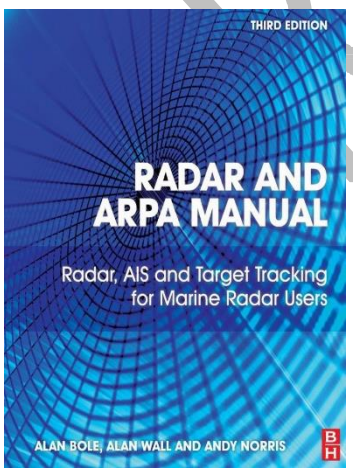
Final Exams	30%
	100%

The following is a breakdown of the final course grading:

93.0 100	**A 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 60.0	**I**
Incomplete	

Syllabus Changes

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



RADAR OBSERVER MANUAL

6th Edition

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