

**THE CITY UNIVERSITY OF NEW YORK
KINGSBOROUGH COMMUNITY COLLEGE
OFFICE OF MARITIME TECHNOLOGY**

**MT-30 INTRODUCTION TO MARITIME
TECHNOLOGY I**

Anthony D. DiLernia
Maritime Technology
Office: T-301C
Telephone: (718) 368-4558
e-mail: adilernia@kingsborough.edu

MTXX INTRODUCTION TO MARITIME TECHNOLOGY-3 credits, 3 hours

An introduction to a body of general knowledge that will serve as a foundation to understanding and applying seamanship theory.

TEXTBOOK-

Chapman Piloting and Seamanship, 65th Edition, by Elbert S. Maloney, (New York: Hearts Books, 2006)

GRADING POLICY-

Midterm 50%
Final exam 50%

Students are referred to the Student Attendance in the 2015-2016 Kingsborough Community College Catalog.

TOPICAL OUTLINE

Unit 1 Maritime Careers

- 1.1 Maritime careers: deck vs. engine
- 1.2 Maritime careers: blue water vs. brown water
- 1.3 Maritime licensing
- 1.4 Deckineer

- 1.5 Tugs and towing
- 1.5 Ferries
- 1.7 Excursion vessels
- 1.8 Private yachts

LEARNING OBJECTIVES FOR UNIT 1

- 1.1 Differentiate between career paths within the field of vessel operations.
- 1.2 Distinguish between blue and brown water operations.
- 1.3 Outline the various types of license required by different maritime career paths.
- 1.4 Define “deckineer”.
- 1.5 Describe the operation of tugs and towing vessels.
- 1.6 Describe the operations of ferries.
- 1.7 Describe the operations of excursion vessels.
- 1.8 Distinguish between the operations of private yachts and commercial vessels.

Unit 2 Nautical Terminology

- 2.1 Industry specific terminology
- 2.1 Types of vessels
- 2.3 Parts of vessels
- 2.4 Directions on a vessel
- 2.5 Relative bearings
- 2.6 Vessel dimensions
- 2.7 Personnel
- 2.8 Vessel Interiors

LEARNING OBJECTIVES FOR UNIT 2

- 2.1 Describe the reasons for using industry specific terminology, and illustrate its necessity in an operational environment.
- 2.2 Differentiate types of vessels according to application.
- 2.3 Label parts of a vessel.
- 2.4 Describe directions on board a vessel.
- 2.5 Demonstrate the use of relative bearings.
- 2.6 Explain what dimensions are used to define vessel size.
- 2.7 Identify the persons involved with a vessel’s operation
- 2.8 Define the different terms used for features of a vessel’s interior.

Unit 3 Review & Nautical Terminology Continued

- 3.1 Review unit 2, particularly Directions and Relative bearings
- 3.2 Ropes and lines

- 3.3 Equipment
- 3.4 Shoreside structures and equipment
- 3.5 Anchoring and mooring
- 3.6 Vessel motion
- 3.7 Water movement and conditions
- 3.8 Aids to navigation
- 3.9 Miscellaneous

LEARNING OBJECTIVES FOR UNIT 3

- 3.1 Review unit 1, demonstrate the use of directions on board a vessel and relative bearings.
- 3.2 Distinguish various ropes and lines, and their applications.
- 3.3 List equipment used in vessel operation.
- 3.4 Name structures and equipment on shore that are used in vessel operation.
- 3.5 List equipment used in anchoring and mooring.
- 3.6 Identify the various types of motion experienced on board a vessel.
- 3.7 Differentiate between types of water movement and conditions.
- 3.8 Name aids to navigations, both shoreside and afloat.
- 3.9 Identify nautical terms not included in the previous categories.

Unit 4 Boating Laws and Regulations

- 4.1 Jurisdiction
- 4.2 Promulgation and enforcement bodies
- 4.3 Navigation rules
- 4.4 Vessel numbering and documentation
- 4.5 Hull Identification Number
- 4.6 Termination of unsafe use
- 4.7 Duties in case of Accident
- 4.8 Penalties
- 4.9 Homeland security
- 4.10 Crewing requirements
- 4.11 Legal liability
- 4.12 Federal water pollution laws

LEARNING OBJECTIVES FOR UNIT 4

- 4.1 Explain which governmental bodies have jurisdiction over waterborne activities.
- 4.2 Identify which government agencies promulgate and enforce laws regulating waterborne activities.
- 4.3 Outline circumstances that require the application of the Navigation rules.
- 4.4 Discriminate between vessel numbering and documentation.
- 4.5 Define Hull Identification Number.

- 4.6 Describe termination of unsafe use.
- 4.7 List an operator's duties in the event of an accident.
- 4.8 Summarize penalties for violation of laws that regulate waterborne activities.
- 4.9 Recall how homeland security issues impact vessel operation.
- 4.10 Explain crewing requirements and their application.
- 4.11 State the potential liabilities faced by a license holder.
- 4.12 Describe federal water pollution laws.

Unit 5 Propulsion and Hull Design

- 5.1 Gasoline/spark ignition engines
- 5.2 Diesel engines
- 5.3 Wind propulsion
- 5.4 Outboard engines
- 5.5 Inboard engines
- 5.6 Propellers, shafts, and related equipment
- 5.7 Displacement hulls
- 5.8 Hull speed
- 5.9 Planing hulls
- 5.10 Keels and centerboards

LEARNING OBJECTIVES FOR UNIT 5

- 5.1 Describe the operation of a gasoline/spark ignition engine.
- 5.2 Describe the operation of a diesel engine.
- 5.3 Explain the theoretical basis of wind propulsion (i.e. The Bernoulli Principle).
- 5.4 Identify and outboard engine.
- 5.5 Distinguish between an inboard and outboard engine.
- 5.6 Describe the operation of a propellers, shafts and related equipment.
- 5.7 Define displacement hull.
- 5.8 Compute hull speed.
- 5.9 Differentiate between planing and displacement hulls.
- 5.10 Discriminate between keels and centerboards.

Unit 6 Equipment for Boats & Midterm Review

- 6.1 Equipment required by law
- 6.2 Personal floatation devices
- 6.4 Fuel safety issues
- 6.5 Backfire flame control
- 6.6 Ventilation
- 6.7 Sound signals.

- 6.8 Visual distress signals
- 6.9 Marine sanitation devices
- 6.10 Navigation lights
- 6.11 Life rafts
- 6.12 EPIRB
- 6.13 Midterm review

LEARNING OBJECTIVES FOR UNIT 6

- 6.1 Explain how to determine what equipment is required by law, and list such equipment.
- 6.2 Distinguish different types of personal flotation devices and their applications.
- 6.3 List types of fire extinguishers and their applications.
- 6.4 Recall the properties of gasoline and diesel fuel.
- 6.5 Explain the purpose of a backfire flame control device.
- 6.6 State reasons for ventilation requirements.
- 6.7 Outline types of sound signals and their applications.
- 6.8 Describe types of visual distress signals.
- 6.9 Identify different types of marine sanitation devices.
- 6.10 Match required navigation lights to the appropriate vessel.
- 6.11 Differentiate types of life rafts.
- 6.12 Describe the mechanism and application of an EPIRB.
- 6.13 Review material covered in Units 1-5, in preparation for midterm examination.

Unit 7 Marlinespike Seamanship

- 7.1 Knots
- 7.2 Breaking strength
- 7.3 Bends and hitches
- 7.4 Making fast to a cleat
- 7.5 Making fast to a bitt
- 7.6 Bowline
- 7.7 Half hitch
- 7.8 Anchor bend
- 7.9 Square knot
- 7.10 Sheet bend

LEARNING OBJECTIVES FOR UNIT 7

- 7.1 Define a knot and explain its theoretical basis.
- 7.2 Infer how a knot's theoretical basis determines its breaking strength
- 7.3 Point out the functions of bends and hitches.
- 7.4 Demonstrate the ability to make fast to a cleat.
- 7.5 Demonstrate the ability to make fast to a bitt.
- 7.6 Demonstrate the ability to tie a bowline.

- 7.7 Demonstrate the ability to tie a half hitch.
- 7.8 Demonstrate the ability to tie an anchor bend.
- 7.9 Demonstrate the ability to tie a square knot.
- 7.10 Demonstrate the ability to tie a sheet bend.

Unit 8 Sailing Nomenclature

- 8.1 Review of the Bernoulli Principle.
- 8.2 Mast.
- 8.3 Standing rigging
- 8.4 Boom.
- 8.5 Mainsail.
- 8.6 Running rigging.
- 8.7 Halyard.
- 8.8 Sheet.
- 8.9 Luff.
- 8.10 Leach.
- 8.11 Foot.
- 8.12 Sloop.
- 8.13 Headsail.

LEARNING OBJECTIVES FOR UNIT 8

- 8.1 Explain the theoretical basis of wind propulsion.
- 8.2 Label the mast of a sailing vessel.
- 8.3 Define standing rigging.
- 8.4 Label the boom of a sailing vessel.
- 8.5 Label the mainsail of a sailing vessel.
- 8.6 Define running rigging.
- 8.7 Label the halyard of a sailing vessel.
- 8.8 Label the mainsheet of a sailing vessel.
- 8.9 Label the luff of a sail.
- 8.10 Label the leach of a sail.
- 8.11 Label the foot of a sail.
- 8.11 Describe a sloop.
- 8.13 Label a headsail.

Unit 9 Sailing Nomenclature Continued & Seamanship Under Sail

- 9.1 Ketch
- 9.2 Yawl

- 9.3 Schooner
- 9.4 Mizzen
- 9.5 Gaff rigged
- 9.6 Square rigged
- 9.7 Points of sail
- 9.8 Windward and leeward
- 9.9 Tacking
- 9.10 Jibing

LEARNING OBJECTIVES FOR UNIT 9

- 9.1 Match the term ketch to the correct illustration.
- 9.2 Match the term yawl to the correct illustration.
- 9.3 Match the term schooner to the correct illustration
- 9.4 Label a mizzen.
- 9.5 Match the term gaff rigged to the correct illustration.
- 9.6 Match the term square rigged to the correct illustration.
- 9.7 Identify the twelve points of sail
- 9.8 Distinguish between windward and leeward.
- 9.9 Define tacking.
- 9.10 Define jibing.

Unit 10 Seamanship Under Power & The Mariner's Compass

- 10.1 Single screw
- 10.2 Twin screw.
- 10.3 Rudder
- 10.4 Steerageway
- 10.5 Pivot point
- 10.6 Maneuvering against dock lines
- 10.7 The earth's magnetic field
- 10.8 Magnetic North.
- 10.9 True North
- 10.10 Variation
- 10.11 Deviation
- 10.12 Steering by compass

LEARNING OBJECTIVES FOR UNIT 10

- 10.1 Explain the handling properties of a single screw vessel.
- 10.2 Distinguish the handling properties of a twin screw vessel from those of a single screw vessel.
- 10.3 Describe the mechanism, function and application of a rudder.

- 10.4 Predict a vessel's handling characteristics without adequate steerageway.
- 10.5 Infer the location of a vessel's pivot point.
- 10.6 Diagram how a vessel can be maneuvered against dock lines.
- 10.7 Explain how a compass relies on the earth's magnetic field to function.
- 10.8 Describe magnetic North.
- 10.9 Identify true North.
- 10.10 Deduce the existence of variation.
- 10.11 Explain deviation.
- 10.12 Demonstrate steering by compass.

Unit 11 Aids to Navigation

- 11.1 Buoys: colors, shapes, numbers, lights, and sounds
- 11.2 Channel markers
- 11.3 Bifurcation buoys
- 11.4 Midchannel/fairway buoys
- 11.5 Isolated danger buoys
- 11.6 Daybeacons and minor lights
- 11.7 Ranges
- 11.8 Variations to IALA-B
- 11.9 Primary seacoast lights
- 11.10 Sector lights

LEARNING OBJECTIVES FOR UNIT 11

- 11.1 List the characteristics that can be applied to buoys.
- 11.2 Explain the function of channel markers in the context of the IALA-B system.
- 11.3 Explain the function of bifurcation buoys in the context of the IALA-B system.
- 11.4 Explain the function of midchannel/fairway buoys in the context of the IALA-B system.
- 11.5 Explain the function isolated danger buoys in the context of the IALA-B system.
- 11.6 Describe how daybeacons and minor lights are used in conjunction with buoys in the context of the IALA-B system.
- 11.7 Demonstrate the use of a model range.
- 11.8 List examples of variations to the IALA-B system.
- 11.9 Discriminate between primary seacoast lights and the IALA-B system.
- 11.10 Describe the properties and functions of sector lights.

Unit 12 The Nautical Chart

- 12.1 Charts vs. maps
- 12.2 Cartographic projection
- 12.3 The Mercator projection
- 12.4 Meridians and parallel

- 12.5 Degrees, minutes, and seconds
- 12.6 The nautical mile
- 12.7 Chart scales
- 12.8 The compass rose
- 12.9 Depth curves
- 12.10 Abbreviations and symbols

LEARNING OBJECTIVES FOR UNIT 12

- 12.1 Explain the difference between charts and maps.
- 12.2 Summarize the process of cartographic projection.
- 12.3 Describe how a Mercator projection is made, and list its advantages and disadvantages.
- 12.4 Identify meridians and parallels, demonstrate the ability to describe locations using the latitude and longitude grid.
- 12.5 Distinguish between degrees, minutes, and seconds on a nautical chart.
- 12.6 Define the nautical mile in the context of the latitude and longitude grid.
- 12.7 Compute sample scales.
- 12.8 Infer the application of the compass rose.
- 12.9 Identify depth curves.
- 12.10 Define important abbreviations and symbols found on the nautical chart.