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

MT-30 INTRODUCTION TO MARITIME TECHNOLOGY I

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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-


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
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
2.2 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
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 navigation, 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.