



**MODEL  
TRAINING COURSES FOR  
BOATMASTERS**

**GRADES  
1, 2 & 3**

**Prepared by the  
INTERNATIONAL MARITIME ORGANIZATION  
for  
Caribbean Countries**

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## **PREAMBLE**

The Code of Safety for Small Commercial Vessels (SCV), developed by the International Maritime Organization (IMO) for small commercial vessels operating in the Caribbean, prescribes standards relating to the safety of these vessels and the licensing of the operational personnel as Boatmasters and Boat Engineers.

Following the distribution of the SCV Code to Maritime Administrations in the Caribbean, it was suggested that the development of model training courses for Boatmasters and Boat Engineers could provide guidance to instructors in delivering these courses and assist in the effective implementation of the Code in achieving a more rapid transfer of information and skills regarding new developments in maritime technology.

It was appreciated that the Model Training Courses would help instructors to improve the quality of existing courses, enhance the effectiveness in meeting the requirements of the Code, and assist the establishment of these courses in Caribbean countries. The model courses would also supplement the training provided by training institutions.

These model courses may be used by training institutions and the IMO is prepared to assist Caribbean developing countries in implementing them when requisite finances are available.

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## DEFINITIONS

1. *Administration* means the Maritime Administration of a Country.
2. *Coastal waters* means an area designated as such by the Administration and where this is not so designated, it means an area of not more than 20 nautical miles from a safe refuge.
3. *Commercial vessel means* a vessel in commercial use and includes a passenger vessel
4. *Crew* includes every person except the masters and pilots, employed or engaged in any capacity on board a vessel.
5. *Exposed waters* is a term used in connection with stability criteria and means any waters that are more than 20 nautical miles from a harbour or safe refuge, or those waters which are less than 20 nautical miles from a harbour or safe refuge and which are not designated coastal or protected waters.
6. *Harbour or safe refuge* means a port, inlet or other body of water normally sheltered from heavy seas by land and in which a vessel can navigate and safely moor. The suitability of allocation as a harbour or safe refuge is as determined by the Administration.
7. *Licence* means the legal authorization from the Administration to function in a specific position on a particular vessel operating in a designated location.
8. *Master* means the individual having command of a commercial vessel.
9. *Open boat* means a vessel which is open to the elements and is not fitted a complete watertight or weather tight deck of complete structure above the waterline.
10. *Passenger* means any person carried in a vessel except a person employed or engaged in any capacity on board the vessel or a child under one year of age.
11. *Passenger vessel* means a vessel other than a pleasure vessel carrying more than 12 passengers, and includes a vessel that is provided for the transport or entertainment of lodgers at any institution, hotel, boarding house, guest house other establishment.
12. *Pleasure vessel* means:-
  - (1) (a) any vessel which at the time it is being used is-

- (i) in the case of a vessel wholly owned by an individual or individuals, used only for the sport or pleasure of the owner or the immediate family or friends of the owner or
  - (ii) in the case of a vessel owned by a body corporate, one on which the persons are employees, officers or shareholders of the body corporate, or their immediate families ; and
- (b) on a voyage or excursion which is one for which the owner does not receive money or in connection with operating the vessel or carrying any person, other than as a contribution to the direct expenses of the operation of the vessel incurred during the voyage or excursion; or
- (3) any vessel wholly owned by or on behalf of a club formed for the purpose of sport or pleasure which, at the time it is being used, is used only for sport or pleasure of members of the club or their immediate family, and for the use of which any charges levied are paid into the club funds and applied for the general use of the club; and
- (4) in the case of any vessel referred to in paragraphs (1) or (2), no other payments are made by or on behalf of the users of the vessel, other than by the owner;

and in this definition,

“immediate family” means, in relation to an individual, the husband or wife of the individual and a relative of the individual or the relative’s husband or wife,

“relative” means brother, sister, ancestors or lineal descendants, and owner includes charterer.

13. *Protected waters* means an area of sheltered waters presenting no special hazards such as most rivers, harbours and lakes, designated by the Administration for the operation of small vessels and where not so designated means an area not more than 3 nautical miles from a safe haven.

14. *Vessel* includes any ship or boat or any other description of vessel capable of being navigated.

# **TRAINING COURSES FOR BOATMASTERS**

## **SECTION 1**

### **INTRODUCTION**

#### **1.1 Purpose of the Model Training Course for Boatmasters**

The purpose for the preparation of the Model Training Courses for Boatmasters is to assist training providers and teaching staff in organizing and introducing training for persons intending to operate small commercial vessels (SCV) operating in the Caribbean Sea.

While the intention of these courses is to fulfil the training and licensing needs of the operators, their delivery should not be too rigid nor to be followed blindly by the instructor. The Administration and the instructor must take into consideration the peculiar education and cultural circumstances and the operating environment, while at the same time being careful not to diminish the major objective of providing trained and qualified personnel.

#### **1.2 Use of the Training Courses**

The instructor should review the course plans and detailed syllabi, taking into account the information provided under entry requirements, which are specified in the course frameworks. The actual level of knowledge and skills and prior technical education of the trainee should be kept in mind during this review, and any areas within the detailed syllabi which may cause difficulties because of differences between the actual trainee entry level and that assumed by the course designer should be identified. The instructor, to compensate for these differences, is expected to delete from the course, or reduce the emphasis on, the items dealing with knowledge or skills already attained by the trainee. He should also identify any academic knowledge, skills or technical training which they may not have acquired.

The instructor, by analyzing the detailed syllabi and the academic knowledge required to allow training in the technical areas to proceed can design an appropriate pre-entry course or, alternately insert elements of academic knowledge required to support the technical training elements concerned at appropriate points within the technical course.

The course designer, within the course plan, has indicated an assessment of time which should be allotted to each training area. However, it must be appreciated that these allocations are arbitrary and they assume that the trainees have fully met all entry requirements of the course. The instructor should therefore review these assessments and may need to reallocate the time to achieve the specific learning objective.

The instructor, in making the adjustments which have been mentioned above, should strive to maintain the integrity of the training courses and their objectives.

### **1.3 Lesson Plans**

The instructor, having adjusted the course content to suit the trainee intake and any revision of the course objective, should draw up lesson plans based on the detailed syllabi. Where no adjustments have been found necessary in the learning objectives of the detailed syllabi, the lesson plans may consist of the detailed syllabi with key words or other reminders added to assist the instructor in making his presentation of the material.

### **1.4 Presentation**

The presentation of concepts and methodologies must be repeated in various ways until the instructor is satisfied, by testing and evaluating the trainee's performance and achievements, that the trainee has attained each specific learning objectives or training outcome. The syllabi are laid out in learning objective format and each objective specifies a *required performance* or *what the trainee must be able to do* as the learning or training outcome. Taken as a whole, these objectives aim to meet the knowledge, understanding and proficiency specified in the Code of Safety of Small Commercial Vessels Operating in the Caribbean Sea (SCV Code).

### **1.5 Implementation**

Thorough preparation is the key to the successful implementation of these training courses and to allow for their smooth and effective running, considerable attention must be paid to the availability and use of the following:

- properly qualified instructors
- support staff
- rooms and other spaces
- equipment
- text technical papers and audio-visual aids
- other reference materials.

### **1.6 Training and the SCV Code**

The Training Courses for Boatmasters are designed to prepare potential masters of small commercial vessels to allow them to be examined and licensed by the responsible Administration. These vessels are cargo and passenger vessels of more than five (5) meters but less than twenty four (24) meters in overall length operating in designated waters in the Caribbean Sea.

The SCV Code which outlines the standards for the training and licensing of Boatmasters by the Administration also utilizes guidelines which have been established by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended. (STCW 78). The syllabi for the training of Boatmasters, which form part of the Regulations of the SCV Code, are given at Annex 11 of the Code, while the regulations relating to licensing are at Part A of Chapter IX of the Code.

The Code, among other things, prescribes standards for construction, approved equipment, emergency equipment, operating procedures and crewing of these vessels.

### **1.7 Responsibility of the Administration**

The delivery of these training courses must be approved by the Administration which would also establish the conditions and standards for examination and the issue of licences

The Administration should ensure that these training courses are delivered by instructors in such a manner as to ensure that those who complete the training meet the standards of competence required by the SCV Code.

## **SECTION 2**

### **BOATMASTER GRADE 3**

#### **PART A - COURSE FRAME WORK -**

##### **2A.1 Aim**

The Training Course for Boatmaster Grade 3 aims to provide training for persons to be in command of an open vessel in Protected and Coastal Waters, as designated by the Administration.

##### **2A.2 Objective**

The syllabus for the training of Boatmaster Grade 3 covers the requirements given at Annex 11 of the SCV Code. The candidate, on completing the Training Course for Boatmaster 3, and having been successful in the examination conducted by the Administration will be deemed competent and licensed as Boatmaster Grade 3.

##### **2A.3 Entry Requirements**

A candidate seeking entry to the training course for Boatmaster Grade 3 must:

- be not less than eighteen (18) years of age on completion of the course;
- be certified as being medically fit in accordance with the Shipping Medical Examination Regulations;
- be able to read and write and comprehend and possess some competency in Mathematics and English;
- be successful in an Entrance Test to assess competency in Mathematics, English and Comprehension.

##### **2A.4 Course Certificate**

On successfully completing the training course for Boatmaster 3 the candidate may be issued a Certificate of Successful Completion by the Training Institution.

##### **2A.5 Course Intake**

The level of individual attention which is required to be given by instructors will influence the maximum intake of trainees for the Training Course. This will also be influenced by the availability of instructors, equipment and facilities.

However, an instructor to trainee ratio of not more than 1:15 for theoretical sessions and 1: 10 for practical sessions are proposed.

## **2A.6 Staff Requirements**

All training and instruction should be conducted by appropriately qualified personnel. The Senior Instructor should be the holder a Certificate of Officer in Charge of a Navigational Watch, with training and experience as an instructor.

The average ratio of instructor to trainee as noted in **2A.5 above** should always be borne in mind when satisfying the staff requirements for theoretical and practical training.

## **2A.7 Training Facilities and Equipment**

Class room facilities should be available to accommodate the class size comfortably and provided with required equipment such as overhead projector, video players, flip charts and computers. Video tapes, computer generated materials and other similar aids appropriate for the course should also be available to supplement lecture notes and materials.

Ship models and lighting systems with lights of the appropriate colours and demonstration table should be available to support lectures in Regulations for the Prevention of Collision at Sea and Seamanship.

A functional and serviceable jetty and a fully equipped and operating vessel similar to that on which the successful candidate will function should be available to accommodate subject areas such as Boat Handling, Emergency Procedures, Regulations for the Prevention of collision at Sea, Seamanship, Passenger Safety and Engineering Knowledge. In addition, a Mechanical Workshop equipped with demonstration engines, tools and diagnostic equipment to support the area of Engineering Knowledge should be available.

Rope and wires of the appropriate types and sizes and the necessary tools and equipment should be available for practical exercises in Seamanship and Rope Work.

## **2A.8 Examination for Boatmaster Grade 3**

The Administration, on approval of the Boatmaster Training course, will determine any matters and procedures associated with the examinations for the issue of Boatmaster Grade 3 Licence.

The examination for a Boatmaster Grade 3 Licence consists of two parts. The first is an Oral Examination in which the candidates will be tested on their knowledge of Safety, Navigation, Rule of the Road, Seamanship and response to Emergency Situations. The

second part consists of a Practical Test carried out on the size of vessel for which the candidate is seeking to be licensed. This test requires the candidates to demonstrate an ability to handle the vessel in various circumstances.

A candidate passing only one part of the examination is allowed to retain the pass on that part for a period of one (1) year subject to the candidate being the holder of a valid Medical Certificate when re-sitting the other part.

## BOATMASTER GRADE 3

### PART B - COURSE OUTLINE

#### 2B.1 Mandatory Training Courses

A candidate for the Boatmaster Grade 3 must successfully complete the Basic Safety Training Courses in accordance with the Model Courses<sup>1</sup> which have been developed by the International Maritime Organization (IMO) and listed below, in addition to the VHF Radio Telephone Operators Licence, and the Syllabus, given at **Sub-section 2B.2 below**.

#### 2B.2 Syllabus for Training Course for Boatmaster Grade 3

Subject Area	Theory (Hrs.)	Practical (Hrs.)
<b>1. <u>Seamanship</u></b>		
1.1 Common nautical terms	1	-
1.2 Types of vessels	0.5	0.5
1.3 Typical parts of a vessel	1	1
1.4 The importance of navigating at reduced speed to avoid damage caused by own vessel bow or stern wave	0.5	1
1.5 The effect of wind and tide on manoeuvrability	0.5	1
1.6 Interaction with other vessels	1	3
1.7 Ropework, Knots and Splices		
<b>2. <u>Regulations for Preventing Collision at Sea</u></b>		
2.1 A practical knowledge of rules of the road appropriate to the area of operation	1	3
2.2 Keeping a good look out	0.5	0.5
<b>3. <u>Local Knowledge and Regulation</u></b>		
3.1 Vessel operation limits	0.5	-

<sup>1</sup> Model Courses

1. Personal Survival Techniques: IMO Model Course 1.19
2. 2. Elementary First Aid: IMO Model Course 1.13
3. 3. Basic Fire Fighting : IMO Model Course 1.20
4. Personal Safety and Social Responsibility: IMO Model Course 1.21

<b>Subject Area</b>	<b>Theory (Hrs.)</b>	<b>Practical (Hrs.)</b>
<b>4. <u>Boat Handling</u></b>		
4.1 Berthing and un-berthing	1	2
4.2 Coming to and weighing anchor	0.5	1
4.3 Make fast to and leaving a buoy	0.5	1
4.4 Boat manoeuvring in confined waters	0.5	2
4.5 Turning short round	0.5	1
4.6 Knowledge of transverse thrust	0.5	0.5
4.7 Steering a compass course and taking a bearing	1	2
<b>5. <u>Emergency Procedures</u></b>		
5.1 Recovery of man overboard	0.5	1
5.2 Loss of engine	0.5	1
5.3 Loss of steering	0.5	1
5.4 Action to be taken in a collision	0.5	-
5.5 Grounding	0.5	-
<b>6. <u>Outboard Engines</u></b>		
6.1 Principles of the outboard engine	1	1
6.2 Operation of the outboard engine	1	2
6.3 Trouble shooting	1	2
6.4 Maintenance and repair of the outboard	1	3
<b>7. <u>Legal Responsibilities Towards Passengers and Crew</u></b>		
7.1 Safe access	0.5	-
7.2 Safe working practices	0.5	-
7.3 Passenger Certificate and law regarding it	0.5	-
<b>8. <u>Passenger Safety</u></b>		
8.1 Safety announcement (SCV Code Reg.VIII/6)	0.5	0.5
8.2 Disposition of passengers and crew to ensure passenger safety	0.5	0.5
8.3 Ability to demonstrate the use of personal life saving equipment appliances	0.5	1

<b>Subject Area</b>	<b>Theory (Hrs.)</b>	<b>Practical (Hrs.)</b>
<b>9. <u>Weather</u></b>  9.1 Sources of weather information 9.2 Local conditions and effects 9.3 Signs of approaching weather 9.4 Making proper use of a weather report given by radio or television	0.5 0.5 0.5 0.5	- - -
<b>10. <u>Prevention of Pollution</u></b>  10.1 Knowledge that disposal into the sea of plastics, including and not limited to synthetic ropes, plastic sheeting and garbage bags etc, is prohibited	0.5	-
<b>11. <u>Review and Assessment</u></b>  SUB-TOTALS  TOTAL NO. OF HOURS 60 (10 Days)	3 <hr/> 26.5	<hr/> 33.5

**BOATMASTER GRADE 3**

**PART C- COURSE TIME TABLE**

**Week 1** [(T) =Theory and (P) = Practical]

<b>Period</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>
1. (1hr.)	Common nautical terms (T)	A practical knowledge of Rules of the Road (P)	The importance of navigating at reduced speed to avoid damage caused by own vessel bow and stern wave(T)/Effect of wind and tide on manoeuvrability(T)	The effect of tide and wind on manoeuvrability(P)	Boat manoeuvring in confined waters (P)
2. (1hr.)	Type of vessels (T)/Types of vessels (P)	A practical knowledge of Rules of the Road (P)	Interaction with other vessels(T)/Keeping a good lookout(T)	Berthing and unberthing (P)	Boat manoeuvring in confined waters (P)
3. (1hr.)	Typical parts of a vessel (T)	Rope work, knots and splices (T)	Berthing and unberthing (T)	Berthing and unberthing (P)	Coming to and weighing anchor(P)
4. (1hr.)	Typical parts of a vessel (T)	Rope work, knots and splices (P)	The importance of navigating at reduced speed to avoid damage caused by own bow and stern wave(P)	Limit to vessel operation (T)/ Coming to and weighing anchor (T)	Turning short(P)
5. (1hr.)	A practical knowledge of Rules of the Road (T)	Rope work, knots and splices (P)	Interaction with other vessels(P)	Boat manoeuvring in confined waters (T)/Turning short(T)	Knowledge of transverse thrust(T)/ Transverse thrust (P)
6. (1hr.)	A practical knowledge of Rules of the Road (P)	Rope work, knots and splices (P)	Making fast and leaving a buoy(T)/ Keeping a good lookout(P)	Loss of steering(T) /Grounding (T)	Making fast and leaving a buoy(P)

### BOATMASTER GRADE 3

#### PART C- COURSE TIME TABLE

**Week 2 [(T) = Theory and (P) = Practical]**

Period	Day 1	Day 2	Day 3	Day 4	Day 5
1. (1hr.)	Steering by compass and taking a bearing (T)	Operation of the outboard engine(P)	Maintenance and repair of the outboard engine (P)	Passenger Certificate and the law regarding it (T)/Ability to demonstrate the use of personal lifesaving appliances (T)	Recovery of man overboard(P)
2. (1hr.)	Steering by compass and taking a bearing (P)	Operation of the outboard engine(P)	Maintenance and repair of the outboard engine (P)	Ability to demonstrate the use of personal lifesaving appliances (T)	Sources of weather information(T)/Signs of approaching weather(T)
3. (1hr.)	Steering by compass and taking a bearing (P)	Troubleshooting on the outboard engine(T)	Maintenance and repair of the outboard engine (P)	Recovery of man overboard(T)/Loss of engine(T)	Local weather conditions and effects (T)/Making proper use of a weather report given by radio or television (T)
4. (1hr.)	Principles of the outboard engine(T)	Troubleshooting on the outboard engine(P)	Safe access(T) /Safe working practices(T)	Loss of steering (P)	Review and Assessment
5. (1hr.)	Principles of the outboard engine(P)	Troubleshooting on the outboard engine(P)	Safety Announcement (Reg.VIII/6) (T)/ Safety Announcement (Reg.VIII/6) (P)	Loss of engine(P)	Review and Assessment
6. (1hr.)	Operation of the outboard engine(T)	Service and maintenance of the outboard engine(T)	Disposition of passengers and crew to ensure passenger safety (T)/Disposition of passenger and crew to ensure passenger safety (P)	Action to be taken in a collision(T)/Knowledge that disposal into the sea of plastics including and not limited to synthetic ropes, plastic sheeting and garbage bags etc is prohibited(T)	Review and Assessment

## BOATMASTER GRADE 3

### PART D – DETAILED TEACHING SYLLABUS

The teaching syllabus is prepared in learning objective format in which the objective describes what the trainee must do to demonstrate that knowledge has been transferred.

All objectives are understood to be prefixed by the words *“The expected learning outcome is that the trainee .....*”

#### **Boatmaster Grade 3**

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<b>1.</b>	<b>Seamanship ( 12.5 hours)</b>		
<b>1.1</b>	<b>Common nautical terms</b> <ol style="list-style-type: none"> <li>1. lists and understands                             <ul style="list-style-type: none"> <li>- ahead</li> <li>- astern</li> <li>- forward</li> <li>- aft</li> <li>- leeward</li> <li>- windward</li> <li>- knot</li> <li>- stability</li> <li>- overall length</li> <li>- beam</li> <li>- draft</li> </ul> </li> </ol>	Day Skipper- page 3	
<b>1.2</b>	<b>Types of vessel</b> <ol style="list-style-type: none"> <li>1. lists and identifies on sketch, drawing or picture                             <ul style="list-style-type: none"> <li>- sailboat</li> <li>- cargo vessel</li> <li>- container</li> <li>- passenger vessel</li> <li>- Ro-Ro</li> <li>- fishing vessel</li> <li>- motor cruiser</li> <li>- bulk carrier</li> <li>- gas carrier</li> </ul> </li> </ol>	Day Skipper- pages 12-14  Sea Trading vol. 1 pages 1-2 Chapters 8-19  The Boatman’s Manual Chapter 1 pages 1-8	
<b>1.3</b>	<b>Typical parts of a vessel</b> <ol style="list-style-type: none"> <li>1. list and identifies on diagram</li> </ol>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>- bow</li> <li>- stern</li> <li>- port</li> <li>- starboard</li> <li>- port bow</li> <li>- starboard bow</li> <li>- port beam</li> <li>- starboard beam</li> <li>- port quarter</li> <li>- starboard quarter</li> <li>- deck</li> <li>- wheel house/bridge</li> <li>- engine room</li> <li>- galley</li> </ul>	Day Skipper- pages 5-9	
<b>1.4</b>	<p><b>The importance of navigating at reduced speed to avoid damage by own vessel bow or stern wave</b></p> <ol style="list-style-type: none"> <li>1. explains <ul style="list-style-type: none"> <li>- the effects of own bow and stern wave on the operation of the vessel</li> <li>- how reduced speed can avoid damage by own bow or stern wave</li> </ul> </li> <li>2. demonstrates <ul style="list-style-type: none"> <li>- the proper procedures to avoid damage caused by own bow or stern wave</li> </ul> </li> </ol>		
<b>1.5</b>	<p><b>The effect of wind and tide on manoeuvrability</b></p> <ol style="list-style-type: none"> <li>1. explains <ul style="list-style-type: none"> <li>- sea breeze</li> <li>- land breeze</li> <li>- Trade winds</li> <li>- Tidal terms i.e. high tide, low tide, high and low water, tidal range, spring and neap tide.</li> <li>- the effects of wind and tide on water</li> <li>- the effect of wind and tide on movement and vessel</li> </ul> </li> </ol>	Yachtmaster pages 74-75	
<b>1.6</b>	<p><b>Interaction with other vessels</b></p> <ol style="list-style-type: none"> <li>1. understands</li> </ol>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>- the pressure fields when two vessels at high speed pass close to each other</li> <li>- swinging off course</li> <li>- lateral displacement</li> <li>- the effects when vessels move in the same direction</li> <li>- the effects in shallow and deep water</li> </ul>	Nicholls's Seamanship and Nautical Knowledge- Chapter X	
<b>1.7</b>	<p><b>Rope Works, Knots and Splices</b></p> <ol style="list-style-type: none"> <li>1. identifies <ul style="list-style-type: none"> <li>- the different type of ropes and the material used in their manufacture</li> <li>- the different sizes of ropes</li> </ul> </li> <li>2. lists the uses for the different types and sizes of ropes</li> <li>3. prepares the following knots and explains their uses <ul style="list-style-type: none"> <li>- clove hitch</li> <li>- reef knot</li> <li>- sheet bend (single and double)</li> <li>- rolling hitch</li> <li>- bowline and bowline on the bight</li> <li>- figure eight</li> <li>- round turn and two half hitches</li> <li>- marlin spike hitch</li> <li>- crown knot</li> <li>- wall knot</li> <li>- splices and other methods of joining ropes</li> </ul> </li> <li>4. identifies and describes <ul style="list-style-type: none"> <li>- cleat</li> <li>- winch</li> <li>- jammer</li> </ul> </li> <li>5. knows <ul style="list-style-type: none"> <li>- making fast to a cleat</li> <li>- basic winching techniques</li> </ul> </li> </ol>	<p>The Boatman's Manual pages 51-80</p> <p>Day Skipper pages 16-17</p> <p>Nicholls's Seamanship and Nautical Knowledge – Chapter 1</p> <p>Modern Marlin Spike Seamanship Chapters 1-5</p>	
<b>2.</b>	<p><b>Regulations for Preventing Collision at Sea (5.5 hours)</b></p>	A Seaman's Guide to the Rules of the Road	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<b>2.1</b>	<p><b>A Practical knowledge of rules of the road appropriate to the area of operation</b></p> <ol style="list-style-type: none"> <li>1. identifies <ul style="list-style-type: none"> <li>- the different types of vessels</li> </ul> </li> <li>2. identifies and explains <ul style="list-style-type: none"> <li>- lights and signs carried by different types of vessels in relation to their operations</li> <li>- navigation lights, markers and buoyage system in the area of operation</li> </ul> </li> <li>3. explains and demonstrates by use of models knowledge of actions to be taken when vessels interact</li> </ol>	Day Skipper – pages 30 –35	
<b>2.2</b>	<p><b>Keeping a good look out</b></p> <ol style="list-style-type: none"> <li>1. identifies: <ul style="list-style-type: none"> <li>- types of vessels</li> <li>- sound signals</li> <li>- distress signals</li> <li>- vessel lights and shapes</li> <li>- buoyage systems, markers</li> <li>-</li> </ul> </li> <li>2. is able to : <ul style="list-style-type: none"> <li>- estimate distance and direction and speed of other vessels relative to own in the vicinity</li> </ul> </li> </ol>	A Seaman’s Guide to the Rules of the Road page 14	
<b>3.</b>	<p><b>Local knowledge and regulations(0.5 hour)</b></p> <ol style="list-style-type: none"> <li>1. knows in some detail <ul style="list-style-type: none"> <li>- the physical surroundings of the area of operation</li> </ul> </li> <li>2. understands <ul style="list-style-type: none"> <li>- the operational capabilities of the vessel</li> <li>- regulations specific to the area of operation</li> </ul> </li> </ol>		
<b>4.</b>	<p><b>Boat Handling (14.5 hours)</b></p>	Nicholl’s Seamanship and Nautical Knowledge	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<b>4.1</b>	<p><b>Berthing and Unberthing</b></p> <ol style="list-style-type: none"> <li>1. lists and knows the uses of: <ul style="list-style-type: none"> <li>- fender</li> <li>- fender board</li> <li>- mooring ring</li> <li>- bollard</li> <li>- bow line</li> <li>- stern line</li> <li>- bow or fore spring</li> <li>- stern or back spring</li> <li>- fairlead</li> <li>- warp</li> </ul> </li> <li>2. understands <ul style="list-style-type: none"> <li>- the current, wind and tidal activities at the location and effects on vessel</li> <li>- vessel manoeuvres</li> <li>- sequence of attaching and releasing berthing lines under specific conditions</li> </ul> </li> <li>3. demonstrates <ul style="list-style-type: none"> <li>- the ability to safely berth and unberth vessel under varying conditions</li> </ul> </li> </ol>	<p>Chapter 10</p> <p>Day Skipper pages 18-19</p> <p>Trawlerman's handbook pages 164-168</p>	
<b>4.2</b>	<p><b>Coming to and Weighing Anchor</b></p> <ol style="list-style-type: none"> <li>1. knows <ul style="list-style-type: none"> <li>- the different types of anchors and their uses</li> </ul> </li> <li>2. understands <ul style="list-style-type: none"> <li>- scope and depth of water</li> <li>- swing</li> <li>- types of seabed</li> <li>- effect of nature of seabed, depth of water, wind, tide, current, scope,</li> </ul> </li> </ol>	<p>Day Skipper pages 20-21</p> <p>Nicholl's Seamanship and Nautical Knowledge Chapter 10</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>swing on safe anchorage</li> <li>- timely preparation of anchor system</li> <li>- the need to reduce speed or stopping vessel at anchor location</li> <li>- the need for anchor light or warning</li> </ul> <p>3. understands</p> <ul style="list-style-type: none"> <li>- the processes of handling and storage of anchor and gear</li> <li>- the operation of winch machinery in retrieving anchor</li> <li>- situations with foul release and retrieve of anchor</li> <li>- ground tackle</li> <li>- mooring lines</li> </ul> <p><b>4.3 Make Fast and Leaving a Buoy</b></p> <p>1. knows</p> <ul style="list-style-type: none"> <li>- the wind, current , tidal and sea conditions of the location</li> <li>- the position, swing and movement of the buoy</li> </ul> <p><b>4.4 Boat Manoeuvring in confined waters</b></p> <p>1. understands confined waters :</p> <ul style="list-style-type: none"> <li>- shallow water effect</li> <li>- interaction between sea bed and the hull in vessel handling</li> <li>- squat</li> <li>- steering in shallow water</li> <li>- operation in restricted channels</li> </ul> <p><b>4.5 Turning Short Round</b></p> <p>1. explains:</p> <ul style="list-style-type: none"> <li>- the right hand and left hand propeller</li> <li>- the basic principles of single and twin screw propellers</li> <li>- turning round short with a single screw vessel</li> <li>- turning short with a twin screw vessel</li> <li>- demonstrates the process of turning short</li> </ul>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<b>4.6</b>	<p><b>Knowledge of transverse thrust</b></p> <p>1. understands :</p> <ul style="list-style-type: none"> <li>- propeller blade design in relation to transverse force and fore and aft force</li> <li>- with right hand propeller, going ahead, stern cants to starboard: going astern, stern canst to port briskly</li> </ul>		
<b>4.7</b>	<p><b>Steering a compass course and taking a rough bearing</b></p> <p>1. knows</p> <ul style="list-style-type: none"> <li>- construction of the magnetic compass</li> <li>- the compass rose and points</li> </ul> <p>2. understands</p> <ul style="list-style-type: none"> <li>- the effects of ferrous materials, magnetism and electromagnetism on the magnetic compass</li> <li>- magnetic north</li> <li>- true north</li> <li>- deviation</li> <li>- variation</li> <li>- deviation and variation corrections</li> <li>- the effects of wind , tide and current on the vessel</li> </ul> <p>3. demonstrates</p> <ul style="list-style-type: none"> <li>- use of the hand held magnetic compass in taking bearings</li> <li>- keeping vessel head on a given compass course</li> </ul>	<p>Day Skipper pages 40-41</p> <p>An Introduction to Coastal Navigation- A Seaman’s Guide pages 21-41</p>	
<b>5.</b>	<p><b>Emergency Procedures (5.5 hours)</b></p>	<p>Seamanship the Illustrated Guide for the Cruising Yachtman Pages 177-188</p>	
<b>5.1</b>	<p><b>Recovery of man overboard</b></p> <p>1. knows</p> <ul style="list-style-type: none"> <li>- equipment for man over board procedures and their use</li> </ul> <p>2. has knowledge of</p> <ul style="list-style-type: none"> <li>- sound alarms</li> </ul>	<p>Nicholls’s Seamanship and Nautical Knowledge</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>- engine astern if necessary</li> <li>- positioning vessel in the direction of person overboard</li> <li>- stopping engines</li> </ul> <p>3. is capable of marking of position of man overboard</p> <p>4. assigning watch for person in water</p> <p>5. throwing of retrieval equipment to person in water</p> <p>6. safe manoeuvring of vessel to pick up person i.e. the Anderson and Williamson turns</p> <p>7. safe pick up of person in water using the lifesling</p>	Chapter VIII	
<b>5.2</b>	<p><b>Loss of engine</b></p> <p>1. explains and knows how to:</p> <ul style="list-style-type: none"> <li>- use an auxiliary if one exists</li> <li>- use a sea anchor</li> <li>- fix position</li> <li>- alert shipping</li> <li>- install appropriate lights or signals</li> <li>- request assistance</li> </ul>	Nicholls's Seamanship and Nautical Knowledge Chapter XI	
<b>5.3</b>	<p><b>Loss of steering</b></p> <p>1. explains and knows how to:</p> <ul style="list-style-type: none"> <li>- use emergency steering gear</li> <li>- reduce speed or stop</li> <li>- use sea anchor/main anchor</li> <li>- fix position</li> <li>- alert shipping</li> <li>- seek assistance</li> </ul>	Nicholls's Seamanship and Nautical Knowledge- Chapter XI	
<b>5.4</b>	<p><b>Action to be taken in collision</b></p> <p>1. explains:</p> <ul style="list-style-type: none"> <li>- immediate sounding of the alarm</li> <li>- the securing of all water tight doors</li> <li>- stop engines or full astern</li> <li>- checking of damage and</li> </ul>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<p>implementing damage control i.e. plugging of leaks, pumping of bilge, ingress of water</p> <ul style="list-style-type: none"> <li>- the dispatch of distress signals by flares, radio etc.</li> <li>- the need to assist other vessel in collision</li> <li>- the flying of signal indicating vessel not under command</li> <li>- inform other shipping rescue craft and other relevant agencies</li> </ul>	Nicholls's Seamanship and Nautical Knowledge Chapter XI	
<b>5.5</b>	<p><b>Grounding</b></p> <p>1. explains</p> <ul style="list-style-type: none"> <li>- accidental grounding also means stranding</li> <li>- immediate stoppage of engines</li> <li>- sounding of alarms</li> <li>- securing of water tight doors</li> <li>- implementation of damage control</li> <li>- preparation for evacuation</li> <li>- transmission of distress signals</li> <li>- informing shipping and rescue services</li> </ul>	Nicholls's Seamanship and Nautical Knowledge Chapter XI	
<b>6.</b>	<p><b>Outboard Engines (12 hours)</b></p>	Marine Outboard Motors Chapters 1-9	
<b>6.1</b>	<p><b>Principles of the outboard motor</b></p> <p>1. lists the components of a typical outboard motor and identifies them on a diagram and the unit:</p> <ul style="list-style-type: none"> <li>- top cowling</li> <li>- recoil starter handle</li> <li>- gear shift lever</li> <li>- throttle control/steering handle</li> <li>- choke knob</li> <li>- engine stop switch</li> <li>- transom clamp handle</li> <li>- tilt support lever</li> <li>- fuel cock</li> <li>- trim angle adjusting rod</li> <li>- anti-cavitation plate</li> <li>- propeller</li> <li>- propeller, drive and crank shafts</li> </ul>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<p><b>6.2</b></p> <p><b>6.3</b></p>	<ul style="list-style-type: none"> <li>- flywheel</li> <li>- ignition system- spark plugs, points, condenser,</li> <li>- recoil starter cord</li> <li>- carburettor</li> <li>- choke</li> <li>- fuel filter</li> <li>- fuel pump</li> </ul> <p><b>Operation of the outboard motor</b></p> <p>1. explains and indicates knowledge of:</p> <ul style="list-style-type: none"> <li>- type of gas and oil</li> <li>- ratio of gas /oil mixture</li> <li>- lubricating system</li> <li>- starting the motor</li> <li>- fuel system and carburettor</li> <li>- the electrical system</li> <li>- ignition system</li> <li>- spark plug</li> <li>- power transmission system</li> <li>- cooling system</li> <li>- adjustment of power and speed</li> <li>- steering</li> </ul> <p>2. demonstrates the ability to operate the outboard motor in terms of pre-start and running checks, starting, running and stopping, emergency stopping</p> <p><b>Trouble shooting</b></p> <p>1. explains:</p> <ul style="list-style-type: none"> <li>- the operation of the outboard motor</li> <li>- malfunctions or faulty operations associated with: <ul style="list-style-type: none"> <li>▪ starting</li> <li>▪ engine turn over but stalls</li> <li>▪ power loss</li> <li>▪ engine misfire</li> <li>▪ gear shifting is difficult or impossible</li> <li>▪ electrical system</li> <li>▪ ignition system</li> <li>▪ propeller</li> </ul> </li> </ul>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<p>2. explains and demonstrates:</p> <ul style="list-style-type: none"> <li>- correction of faults identified in trouble shooting</li> </ul>		
<b>6.4</b>	<p><b>Service and maintenance of the outboard engine motor</b></p> <p>1. is able to:</p> <ul style="list-style-type: none"> <li>- read and understand service and maintenance manual</li> </ul> <p>2. explains and demonstrates knowledge of:</p> <ul style="list-style-type: none"> <li>- cleaning and washing motor after use</li> <li>- servicing of all moving parts and operating systems</li> <li>- laid up storage and protection</li> </ul>		
<b>7.</b>	<p><b>Legal Responsibilities towards Passengers and Crew (1.5 hours)</b></p>		
<b>7.1</b>	<p><b>Safe Access</b></p> <p>1. explains</p> <ul style="list-style-type: none"> <li>- the safe use of gangway for passengers to access vessel and the quay</li> <li>- the safe use of portable and rope ladders</li> </ul>		
<b>7.2</b>	<p><b>Safe working practices</b></p> <p>1. lists and explains the following as they relate to safe working practice:</p> <ul style="list-style-type: none"> <li>- keeping deck tidy</li> <li>- stowing and securing of ropes and moveable objects on deck, in galley, and engine room</li> <li>- use of appropriate protective gear and equipment i.e. safety boots, hard hat, goggles. ear protectors, gloves coveralls etc</li> <li>- correct ways of moving around the vessel</li> <li>- securing of hatches when not in use</li> <li>- proper lifting of loads</li> <li>- checking ladders and such equipment</li> </ul>	<p>Code of Safe Working Practice for Merchant Seamen Chapters 5, 8 ,9 and 25</p> <p>Small Fishing Vessel Safety pages 32-41</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<p><b>7.3</b></p> <p><b>8.</b></p> <p><b>8.1</b></p> <p><b>8.2</b></p>	<p>before use</p> <ul style="list-style-type: none"> <li>- proper disposal of waste especially flammable waste and those which may result in pollution</li> </ul> <p><b>Passenger certificate and the law regarding it</b></p> <ol style="list-style-type: none"> <li>1. explains and understands: <ul style="list-style-type: none"> <li>- the number of persons permitted on board the vessel as determined by the Administration</li> <li>- keeping Passenger Certificate on board the vessel for verification by the authorities</li> <li>- the preparation of passenger list</li> <li>- the agencies or authorities for lodging of the passenger list</li> </ul> </li> </ol> <p><b>Passenger Safety (3.5 hours)</b></p> <p><b>Safety Announcement (SCV Code Reg.VIII/6)</b></p> <ol style="list-style-type: none"> <li>1. explains and knows <ul style="list-style-type: none"> <li>- the applicable public announcement to passengers in relation to: <ul style="list-style-type: none"> <li>▪ safe access and embarkation and loading procedures;</li> <li>▪ general explanation of emergency procedures;</li> <li>▪ the location of placards relating to: <ul style="list-style-type: none"> <li>- life jackets and other life saving equipment;</li> <li>- location of emergency exits and muster stations;</li> <li>- location of survival craft;</li> <li>- stowage of life jackets;</li> </ul> </li> <li>▪ the wearing of lifejackets in hazardous conditions</li> </ul> </li> </ul> </li> </ol> <p><b>Disposition of passengers and crew to ensure stability and trim</b></p> <ol style="list-style-type: none"> <li>1. understands <ul style="list-style-type: none"> <li>- stability</li> <li>- trim</li> </ul> </li> </ol>	<p>Nicholl's Seamanship and Nautical Knowledge page 389</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
	<p>2. knows;</p> <ul style="list-style-type: none"> <li>- the number of persons permitted on the vessel</li> </ul> <p>3. explains:</p> <ul style="list-style-type: none"> <li>- the loading of passengers to maintain stability and/trim</li> </ul>		
<b>8.3</b>	<p><b>Ability to demonstrate to passengers the use of life saving appliances</b></p> <p>1. successfully completes the IMO Model Course 1.19 on Personal Survival Techniques</p> <p>2. explains and demonstrates:</p> <ul style="list-style-type: none"> <li>- the ability to instruct a passenger on personal life saving appliances such as:</li> <li>- life buoys</li> <li>- inflatable life jackets</li> <li>- the donning of a life jacket.</li> </ul>		
<b>9.</b>	<p><b>Weather (2 hours)</b></p>	Day Skipper pages 64-67	
<b>9.1</b>	<p><b>Sources of information</b></p> <p>1. lists the different sources to obtain a weather report:</p> <ul style="list-style-type: none"> <li>- local radio station</li> <li>- local television station</li> <li>- office of the Harbour Master or Maritime Administration</li> <li>- marinas</li> <li>- recorded reports over the telephone</li> </ul>	Yachtmaster pages 70-77	
<b>9.2</b>	<p><b>Local conditions and effects</b></p> <p>1. explains and understands local conditions for the local area of operation in terms of :</p> <ul style="list-style-type: none"> <li>- winds and wind patterns</li> <li>- tides and tide ranges</li> <li>- temperature ranges</li> <li>- barometric pressures</li> <li>- sea conditions</li> </ul>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aid</b>	
<b>9.3</b>	<b>Signs of approaching weather</b> 1. explains and understands: <ul style="list-style-type: none"> <li>- low pressure</li> <li>- high pressure</li> <li>- depression</li> <li>- winds and wind directions</li> <li>- Beaufort wind scale</li> <li>- sea states, waves and wave heights</li> <li>- weather watch</li> <li>- weather warning               <ul style="list-style-type: none"> <li>▪ imminent</li> <li>▪ soon</li> <li>▪ later</li> </ul> </li> <li>- fair</li> <li>- backing</li> <li>- veering</li> <li>- visibility</li> <li>- general synopsis</li> </ul>	Marine Meteorology Chapters 3:11	
<b>10.</b>	<b>Prevention of Pollution (0.5 hours)</b>	Oil Pollution from ships Chapter 2	
<b>10.1</b>	<b>Knowledge that disposal into the sea of all plastics including but not limited to synthetic ropes, plastic sheeting and garbage etc is prohibited</b> 1. explains: <ul style="list-style-type: none"> <li>- the definition of marine pollution</li> <li>- list of items which can cause marine pollution</li> <li>- general handling and disposal of marine pollutants.</li> </ul>		
<b>11</b>	<b>Review and Assessment (2 Hours)</b>		

## BOATMASTER GRADE 3

### REFERENCES FOR MODEL TRAINING COURSE

1. DAY SKIPPER- INTRODUCTION TO NAVIGATION THEORY, SAFETY AND SEAMANSHIP, 2002: Prepared by Penny Haire, illustrated by Sarah Selman. Royal Yacht Association, RYA House, Ensign Way, Hamble Southampton SO31 4YA, United Kingdom.  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
2. SEA TRADING VOL. 1 – THE SHIP, 1984: William P.V. Packard. Fairplay Publication, London.
3. THE BOATMAN’S MANUAL, 1997 (Revised edition): William Mc Leod, Capt. A.G.W. Miller Brown, Son and Ferguson Ltd. 4-10 Darnley Street, Glasgow.
4. YACHTMASTER- ADVANCED NAVIGATION THEORY , SAFETY AND SEAMANSHIP, 2002: Prepared by Penny Haire and illustrated by Sarah Selman. Royal Yacht Association, Romsey Road, Eastleigh, Hampshire SO50 9YA.  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
5. NICHOLLS’S SEAMANSHIP AND NAUTICAL KNOWLEDGE, 1979: Revised by A.N. Cockcroft, F.R.I. M, Extra Master. Brown, Son and Ferguson Ltd. Nautical Publications, 52 Darnley Street, G41 2SG, Glasgow
6. MODERN MARLIN SPIKE SEAMANSHIP, 1972. By William P. Mac Lean David and Charles New Abbott. London
7. A SEAMAN’S GUIDE TO THE RULES OF THE ROAD, 2003. Morgan Technical Books Ltd. Wotton Under Edge, Gloucestershire, United Kingdom.
8. AN INTRODUCTION TO COASTAL NAVIGATION – A SEAMAN’S GUIDE, 1992. Morgan Technical Books Ltd. P.O. Box 5, The Stables, Darnley, Wotton Under Edge, Gloucestershire, United Kingdom.
9. SEAMANSHIP- THE COMPLETE ILLUSTRATED GUIDE FOR THE CRUISING YACHTSMAN, 1983. By Peter Kemp. Published in the United Kingdom, by Dunitz Ltd.
10. TRAWLERMAN’S HANDBOOK, 1975. Lt. Cdr. R.C. Oliver, D.Sc., R.N. Fishing News (Books) Ltd. 23 Rosemount Avenue, West by Fleet, Surrey, London.
11. MARINE OUTBOARD MOTORS, 2001. Regional Fisheries Training Project – Japan International Cooperation Agency (JICA) and The Caribbean Fisheries Training and Development Institute (CFTDI) Western Main Road, Chaguaramas, P.O. Box 150, Port of Spain, Trinidad and Tobago.
12. SMALL FISHING VESSEL SAFETY MANUAL. Minister of Supply and Services, Canada.
13. MARINE METEOROLOGY, 1961. A Primer for Seamen by G.E. Earl , Extra Master and N. Peter, Extra Master, F.R.M.S. The Maritime Press. 30 Fleet Street, London E.C.4.
14. OIL POLLUTION FROM SHIPS, 1985 (Second edition). International, United Kingdom and the United States Law and Practice by David W. Abecassis and Richard J. Jarashow M.A, Ph. D J.D., L.L. M.

## BOATMASTER GRADE 3

### PART E - INSTRUCTOR MANUAL

#### Introduction

The instructor manual provides guidance on the material that is to be presented during the course. The course material reflects the requirements for the training of Boatmaster 3 in accordance with **Annex 11** of the Code of Safety of Small Commercial Vessels Operating in the Caribbean Sea (SCV Code).

The material has been arranged under eleven main headings:

1. Seamanship
2. Regulations for Preventing Collision at Sea
3. Local Knowledge and Regulations
4. Boat Handling
5. Emergency Procedures
6. Outboard Engines
7. Legal Responsibilities
8. Passenger Safety
9. Weather
10. Prevention of Pollution
11. Review and Assessment

The course outline and time table which include both theoretical and practical sessions provide guidance and time allocations for the course materials. However, as noted earlier at **Section 1.2**, the instructor is free to make adjustments as necessary to facilitate circumstances which may be peculiar to the situation or environment. The detailed teaching syllabus must be studied carefully and lesson plans or lecture notes compiled where appropriate in accordance with Part D – Detailed Teaching Syllabus at page 12.

In addition, it should be noted further that the class size in terms of ratio of instructor to trainee is limited to 1:15 for theoretical sessions and 1:10 for practical sessions to facilitate ease of instruction.

In relation to practical and other specialized aspects of the training, the instructor is advised to fully acquaint and inform trainees in good time of particular requirements.

## **Bibliography**

The attention of the instructor is drawn to bibliographical references to ten (10) of the main subject areas as noted in Part D – Detailed Teaching Syllabus, pages 12 – 25 and the complete list of references at page 26.

## GUIDANCE NOTES

### **1. Seamanship 12.5 hours**

#### **1.1 Common Nautical Terms**

The trainee are to be provided with a list of common nautical terms about which they should be taught and become familiar. This information should be transmitted where practical through demonstrations, drawings, sketches, photograph and the use of scale models.

#### **1.2 Types of Vessels**

The trainee should be taught the different types of vessels with special emphasis on the distinguishing characteristics which identify and differentiate between vessel types in addition to the function and operation of these vessels. Knowledge and information should be imparted through the use of diagrams, illustrations and drawings, photographs and pictures, scale models and viewing of the actual functional operating vessel.

#### **1.3 Typical Parts of a Vessel**

The trainee must be taught and be able to identify the typical parts of a vessel and the instructor would ensure this is achieved thorough explanations and the use of drawings and illustrations, photographs and pictures, scale models and actual operating vessels.

#### **1.4 The Importance of Navigating at Reduced Speed to Avoid Damage by Own Vessel Bow or Stern Wave**

The instructor **should** explain to the trainee the effects of waves on the safety of a vessel's operation and navigation with emphasis on how waves created by a vessel may cause damage and how reduced speed can minimize potential damage.

#### **1.5 The Effect of Wind and Tide on Manoeuvrability**

The types of winds, their formation, direction, force and effects on waves and wave action should be explained to the trainee in addition to how the operation and manoeuvring of a vessel may be affected by wind and waves. The definition of tide and description of tidal action and its individual and combined effect with wind and waves on the operation and manoeuvrability on vessels should also be explained to the trainee.

#### **1.6 Interaction with other Vessels**

The instructor should explain to the trainee the situations and scenarios which are likely to occur when two operating vessels are in close proximity such as passing at high speed or moving in the same direction in both deep and shallow water and the safety precaution which must prevail in each situation.

## **1.7 Rope Works, Knots and Splices**

The trainee shall be taught the different type of materials and their characteristics which are used in the manufacture of ropes. The different types of knots and splices and their uses and applications should also be explained to the trainee. Each trainee should be made to demonstrate competence in the preparation of all knots and splices and also explain the usage of each. The great majority of the teaching time should be expended on practical exercises in the preparation of knots and splices and their applications. The use of ropes in relation to cleats, witches and jammers should be explained, taught to the trainees and demonstrated by them.

## **2. Regulations for Preventing Collisions at Sea 5.5 hours**

### **2.1 A Practical Knowledge of Rules of the Road Appropriate to the Area of Operation**

The trainee must be fully informed on the area of operation of his/her vessel in terms of general weather, sea, wind, wave and tide conditions in addition to vessel traffic, markers, buoyage systems. Care and patience must be taken by the instructor to explain the critical importance of the Rules of the Road. Table models should be used to demonstrate lights, signals, markers, buoys and the correct method of passing, overtaking or crossing the path of another vessel. The trainee must also be able to identify other vessels and identify their lights, signals and operating status.

### **2.2 Keeping a Good Look Out**

In keeping a good lookout, the trainee must be instructed and have knowledge of types of vessels, sound signals, distress signals, identification of other vessels, their lights, signals and operating status, use of radar and radio in the circumstances, methods of communicating relevant look out information to the master of the vessel and other crew members. The trainee must also be able to interpret the weather and judge the distance of other vessels, objects and lights from own ship.

## **3. Local Knowledge and Regulations 0.5 hour**

The trainee must have detailed information on the physical surroundings and environment of the local area of operations including the safety of navigation and the accompanying regulations.

## **4. Boat Handling 14.5 hours**

### **4.1 Berthing and Unberthing**

In these activities the trainee must be involved in extended practical exercises and demonstrations which should be supported by competence on vessel handling and knowledge of the effects of wind, tide, current and wave action on berthing and unberthing of a vessel. Information and a thorough knowledge of mooring lines, their function and arrangements are

also important elements which the trainee must learn. The trainee must also demonstrate competence to the satisfaction of the instructor in berthing and unberthing a vessel under various conditions.

#### **4.2 Coming to and Weighing Anchor**

Knowledge of the different types of anchors, their uses and capabilities is important to the trainee. This should be supported by information on the use and effectiveness of anchors on the type of seabed and also the effects of tides, current, wind and waves on safe anchoring. Explanation should be provided on the setting and the retrieval of anchors by manual and mechanical means in addition to action to be taken in the event of fouling. Information on safety precautions in the exercises is also necessary. Extensive practical exercises should be conducted until the trainee is competent

#### **4.3 Making Fast and Leaving a Buoy**

The safety of these operations should be taught to the trainee in a practical manner, however, he must be also be tutored in areas such as the motion of the buoy as this may be affected by wind, current and wave action and the relative manoeuvring of the vessel to effect the tasks of making fast and leaving safely. Demonstration by the instructor and practical exercise by the trainee should be conducted until competency is achieved.

#### **4.4 Boat Manoeuvring in Confined Waters**

The trainee should be made to appreciate the dangers which can arise to own vessel, other vessel and personnel if the exercise is not conducted safely. The safety measures and precautions must be taught and explained to the trainee in a practical manner until competency is achieved to the satisfaction of the instructor. The effect of shallow water, the seabed and restricted channels on vessel manoeuvrability should be explained fully.

#### **4.5 Turning Short Round**

This is a practical exercise in which the instructor should explain and demonstrate the left and right hand propeller and the single and twin screw in the propulsion and operation of a vessel.

#### **4.6 Knowledge of Transverse Thrust**

The design of propeller blades and how it affects transverse thrust should be explained to the trainee by the instructor.

#### **4.7 Steering a Compass Course**

This exercise requires that the instructor explains clearly and teaches the trainee the construction and operation of the magnetic compass and its accuracy, as this may be affected or influenced by magnetism, variation, and deviation. The instructor should also explain and demonstrate how sea conditions such as wind, wave, current and tide may affect the accurate steering of a vessel and the necessary compensations and corrections which are necessary to achieve safe steering.

Demonstrations of the use of the hand held compass in taking a bearing and appropriate corrections of the readings should also be taught and explained.

## **5 Emergency Procedures**

**5.5 hours**

### **5.1 Recovery of Man Overboard**

The instructor should emphasize the problems and difficulties which may be encountered in a man over board situation and guide the trainee through teaching, explanation and practical exercises on the sequences and procedures to be adopted in the rescue or recovery process. This information would include sounding of the appropriate alarm, marking the position of the victim, assignment of a watch, vessel manoeuvres to be executed and the rescue and recovery methods to be employed.

### **5.2 Loss of Engine**

The instructor should define and explain the term loss of engine to the trainee and indicate the dangers and difficulties which may be encountered in such an occurrence. At the same time information and explanation on the emergency procedures to be adopted to mitigate the situation should also be explained in terms of emergency or auxiliary propulsion, use of anchors, alerting other shipping and seeking assistance. Practical demonstration and exercise should be undertaken to familiarize the trainee with the experience.

### **5.3 Loss of Steering**

The instructor should explain to the trainee the situation of loss of steering and the possible difficulties and dangers which may occur as a result. He should also explain the necessary actions which should be taken in such a situation in relation to emergency steering gear, appropriate speed, use of anchors, alerting other shipping and seeking assistance. Practical demonstrations and exercises should be undertaken to familiarize the trainee with the experience.

### **5.4 Actions to be Taken in a Collision**

The instructor should explain to the trainee the possible causes of collisions between vessels and also the various situations which may occur in such an instance to cause danger to a vessel and personnel. The various activities and methods which may be put in place in such circumstances should be explained in sequence as far as practical. The exercises of securing water tight doors, engine operations, use of pumps, plugging of leaks, use of the appropriate distress signals and related contingencies must be explained to the trainee. The use of audio visual materials to assist in familiarizing the trainee with the situations and procedures should be used.

### **5.5 Grounding**

The instructor should explain to the trainee what is a grounding and a stranding and the causes or circumstances of a grounding/stranding. The dangers, problems and difficulties which may occur in the event of a grounding must also be explained in addition to familiarizing the trainee on the measures which may be taken to resolve the threatening or dangerous situations to include the

handling of alarms, engines, water tight doors, damage control procedures, evacuation procedures, distress signals and dealing with other shipping.

## **6. Outboard Engines**

**12 hours**

### **6.1 Principles of the Outboard Engine**

The principles of the outboard engine and its component parts should be made familiar to the trainee by the instructor through appropriate explanations, descriptions, illustrations and demonstrations by utilizing diagram, drawings, outboard engine manuals, actual outboard engines and engine parts.

### **6.2 Operation of the Outboard Engine**

The instructor should explain to the trainee the operating principles of the outboard engine and describe and explain the function and connection among all the parts and systems which cause the engine to function efficiently. The trainee should be allowed to demonstrate through theoretical and practical exercises that he understands and is familiar with both the principles and actual operation of the outboard engine to include pre-start and running checks, starting, running, normal and emergency stopping.

### **6.3 Trouble Shooting**

The instructor should explain and ensure that the trainee understands and be familiar with the variety of causes that may result in the malfunctioning of the outboard engine. In this regard the faults should be simulated and the trainee would be required to diagnose the reasons for the malfunction. The trainee, having identified the fault should be instructed on the methods of correction of the particular fault along with use of the proper tools. The trainee should be exposed to extended practical exercises until a level of competence satisfactory to the instructor is achieved.

### **6.4 Service and Maintenance of the Outboard Engine**

The importance and need for preventative maintenance proper servicing and storage of the outboard engine when not in use, in extending its life span, the reduction of repair and maintenance cost and improved safety should be explained to the trainee by the instructor. The trainee under the guidance and to the satisfaction of the instructor undertakes the practices and procedures which are necessary for this training.

## **7. Legal Responsibilities towards Passengers and Crew**

**1.5 hours**

### **7.1 Safe Access**

The structure should explain to the trainee his/her ultimate responsibility for the safety of all personnel, passenger and crew of the vessel under his/her command. In this regard utmost

attention must be paid in providing information and instructions on the correct procedures to adopt when personnel access and depart the vessel under his command.

## **7.2 Safe Working Practices**

The instructor must provide to the trainee detailed explanations on the need for safe working practices on board vessels as this may affect crew, passenger and general working and safety conditions. This information should cover all the areas listed in the Part D - the Detailed Training Syllabus, which should be supported by demonstrations and practice by the trainee to allow him/her to become familiar with the requirements to the satisfaction of the instructor.

## **7.3 Passenger Certificate and the Law Regarding It.**

The trainee should be taught and explained the need for a Passenger Certificate and the legal responsibility in adhering to the laws and procedures pertaining to the preparation, carriage and observation of the requirements for a Passenger List.

## **8. Passenger Safety**

**3.5 hours**

### **8.1 Safety Announcements**

The instructor should ensure through explanation, teaching, practical exercises and demonstrations the trainee understands fully to his satisfaction the Safety Announcement of the CSV Code Regulation VIII/6.

### **8.2 Disposition of Passengers and crew to Ensure Stability**

The instructor should explain to the trainee the salient elements of vessel stability and the causes of instability. Issues of instability as result of the improper loading, seating and offloading of passengers and crew and the dangers and problems which may result should be explained. The safe procedures to be adopted in these circumstances should be explained to the trainee utilizing audio visual presentations and models.

### **8.3 Ability to Demonstrate to Passengers the Use of Life Saving Appliances**

It expected that the trainee would have completed successfully the IMO Model Course 1:19 on Personal Survival Techniques. The instructor must satisfy himself that the trainee through explanation and demonstration is knowledgeable of these techniques. The instructor should explain and demonstrate to the trainee the relevant life saving appliances, where they are stored, how they are accessed in an emergency and the demonstration of their uses to passengers. Practical exercises must be carried out among the trainees so that each becomes familiar with the appliances and their demonstration to passengers to his satisfaction.

## **9. Weather**

**2 hours**

### **9.1 Sources of Information**

The trainee must be informed by the instructor of the frequencies and or channels of the local radio and television stations which broadcast weather information, in addition to the times of these broadcasts. The method and time of accessing the information over the telephones must also be explained. The trainee must also be informed of the addresses, opening hours and procedures of accessing weather information from the office of the Harbour Master or Maritime Administrator and marinas. The trainee must receive practice in these exercises and demonstrate to the instructor satisfactory familiarity with the processes.

### **9.2 Local Conditions and Effects**

Specific information on the weather conditions and their effects in the area of operation must be explained to the trainee by the instructor.

### **9.3 Signs of Approaching Weather**

The trainee should be taught and understand the various elements and factors which comprise weather systems and also their interpretation in determining the weather patterns and general behaviour of the atmosphere and sea conditions as these may affect or influence the safety of navigation.

## **10. Privation of Pollution**

**0.5 hour**

### **10.1 Knowledge that Disposal into the Sea of Plastics including but not limited to Ropes, Plastic Sheeting and Garbage etc is Prohibited**

In this topic the definition and explanation of marine pollution and its effect may be supported by audiovisual presentations.

## EXAMPLE OF A LESSON PLAN

**COURSE:**            **Boatmaster Grade 3**            **Lesson Number**            **Duration:**    **60 Minutes**  
**TRAINING AREA:**    **Regulations for Preventing Collision at Sea**

MAIN ELEMENT Specific learning objective (in teaching sequence with memory keys)	Teaching Method	Text Book Reference	A/V Aids	Instructor Guidelines	Time (Mins)
<b>2      Regulations for the Prevention of Collision at Sea</b>					
<b>2.2    Keeping a Good Lookout</b>		A Seaman's Guide to Rules of the Road		Instructor's Notes	10
1. Vessel types - identification of types of vessel and their operations especially in the shipping location and varying visibility	Classroom lecture				
2. Lights, shapes and sound signals - identifying, distinguishing and interpreting lights, shapes and sound signals during day, night and varying visibility as appropriate - identification, recognition and interpretation of distress signals from other vessels	Classroom lecture		Models and simulations	Instructor's Notes	35
3. Interaction between vessels - ability to estimate distance, direction and speed of other vessels in relation to own vessel	Classroom lecture		Practical Exercise	Instructor's Notes	15

## BOATMASTER GRADE 3

### PART F - EVALUATION

#### **Introduction**

The effectiveness of any evaluation depends upon the accuracy of the description of what is to be measured.

The learning objectives used in the detailed syllabus will provide a sound basis for the construction of suitable tests for evaluating the trainee progress.

#### **Method of Evaluation**

The methods chosen to carry out an evaluation will depend on what the trainee is expected to achieve in terms of knowing, comprehending and applying the course content.

The methods used can range from simple question and answer discussion with the trainee (either individually or as group), or prepared tests requiring the selection of correct or best responses from given alternatives, the correct matching of given items, the supply of short answer or the supply of more extensive written responses to prepared questions.

Where the course content is aimed at the acquisition of practical skills, the test would involve a practical demonstration by the trainee making use of appropriate equipment, tools, etc.

The responses demanded may therefore consist of:

- *the recall of facts, information by viva-voce or objective tests*
- *the practical demonstration of an attained skill*
- *the oral or written description of procedures or activities*
- *the identification and use of data from sketches, drawings, maps, charts, etc*
- *carrying out of calculations to solve numerical problems*
- *the writing of an essay report.*

#### **Validity**

The evaluation must be based on clearly defined objectives, and it must truly represent what is to be measured. There must be a reasonable balance between the subject topic involved and also in the testing of trainee's knowledge comprehension and application of concepts.

The time allocation for the trainee to provide a response is very important. Each question or task must be properly tested and validated before it is used to ensure that the test will provide a fair and valid evaluation.

### **Reliability**

To be reliable, an evaluation procedure should produce reasonably consistent results no matter which set of papers or version of the test involved is used.

### **Subject Testing**

Traditional methods of evaluation require the trainee to demonstrate what has been learned by stating or writing formal answers to questions.

Such evaluation is subjective in that it invariably depends upon the judgment of the evaluator. Different evaluators can produce quite different scores when marking the same paper or evaluating oral answers.

### **Objective Testing**

A variety of objective tests have been developed over the years. Their common feature is that the evaluation does not require a judgment by the evaluator. The response is either right or wrong.

One type of objective test involves supplying an answer, generally a single word, to complete the missing portion of a sentence. Another involves supplying a short answer of two or three words to a question. Such tests are known as ‘completion tests, and ‘short answer tests’.

Another form of objective testing consists of, selective response tests’ in which the correct, or best response must be selected from given alternatives. Such tests may consist of ‘ matching tests,’ in which items contained in two separate lists must be matched, or they may be of the true/false type or of the multiple choice type.

The most flexible form of objective test is the multiple choice test, which presents the trainee with a problem and a list of alternative solutions, from which he must select the most appropriate.

### **Distracters**

The incorrect alternatives in multiple-choice questions are called ‘distracters’, because their purpose is to distract the uninformed trainee from the correct response. The distracter must be realistic and should be based on misconceptions commonly held, or on mistakes commonly made.

The options “none of the above” or “all of the above” are used in some tests. These can be helpful, but should be used sparingly.

Distracters should distract the unformed, but they should not take the form of “trick” questions that could mislead the knowledgeable trainee (for example, do not insert a correct response to make it a distracter).

### **Guess Factor**

The ‘guess factor’ with four alternative responses in a multiple-choice test would be 25%. The pass mark chosen for all selective-response questions should be taken into account.

### **Scoring**

In simple scoring of objective tests one mark may be allotted to each correct response, zero for a nil-response and minus one for an incorrect response. Where a multiple-choice involves four alternatives, this means that a totally unformed guess involves a 25% chance of gaining one mark and a 75% chance of losing one mark.

Scores can be weighted to reflect the relative importance of questions, or of sections of an evaluation.

## SECTION 3

### BOATMASTER GRADE 2

#### PART A – COURSE FRAMEWORK

##### 3A.1 Aim

The Training Course for Boatmaster Grade 2 aims to provide training for persons to be in command of the following vessels in the locations designated by the Administration.

1. a vessel of less than 24m in Protected Waters;
2. a passenger vessel of less than 12m in Coastal waters
3. a vessel of less than 24m other than a passenger vessel in Coastal Waters

Where the Coastal Waters are not so designated, the holder of Boatmaster Grade 2 Licence requires a navigation endorsement from the Administration to operate a vessel more than 20 nautical miles from a safe haven

##### 3A.2 Objective

The syllabus for the training of Boatmaster Grade 2 covers the requirements given at Annex 11 of the SCV Code. The candidate, on completing the Training Course for Boatmaster Grade 2 and having been successful in the examination conducted by the Administration, will be deemed competent and licensed as Boatmaster Grade 2.

##### 3A.3 Entry Requirements

A candidate seeking entry to this Training Course for Boatmaster grade 2 must:

- be not less than twenty (20) years of age on completion of the course;
- be certified as being medically fit in accordance with the Shipping Medical Examination Regulations;
- be able to read, write and comprehend with some proficiency in Mathematics and English;
- have successfully completed the Training Course for Boatmaster 3 or be licensed as a Boatmaster Grade 3.

##### 3A.4 Course Certificate

On successful completion of the Training Course for Boatmaster Grade 2, the candidate may be issued a Certificate of Successful Completion by the Training Institution.

### **3A.5 Course Intake**

The level of individual attention which is required to be given by instructors will influence the maximum intake of trainees for the Training course. This will also be influenced by the availability of instructors, equipment and facilities. However, an instructor to trainee ratio of not more than 1:15 for theoretical sessions and 1:10 for practical sessions are proposed.

### **3A.6 Staff Requirements**

All training and instruction should be conducted by appropriately qualified personnel. The Senior Instructor should be the holder of an Officer in Charge of a Navigational Watch Certificate, with training and experience as an instructor.

The average ratio of instructor to trainee as noted in **Sub-section 3A.5 above** should always be borne in mind for theoretical and practical training.

### **3A.7 Training Facilities and Equipment**

Class room facilities should be available to accommodate the class size comfortably and be provided with required equipment such as overhead projector, video players, flip charts and computers. Video tapes, computer generated materials and other similar aids appropriate for the course should also be available to supplement lecture notes and materials.

Ship models and lighting systems with lights of the appropriate colours and a demonstration table should be available to support lectures in Regulations for the Prevention of Collision at Sea and Seamanship.

A functional and serviceable jetty and a fully equipped and operating vessel similar to that on which the successful candidate will function should be available to facilitate training in the areas of Boat Handling, Emergency Procedures, Regulations for the Prevention of Collision at Sea, Seamanship, Passenger Safety and Engineering Knowledge. In addition, a Mechanical Workshop equipped with demonstration engines, tools and diagnostic equipment to support the area of Engineering Knowledge should be available.

Rope and wires of the appropriate types and sizes and the necessary tools and equipment should be available for practical exercises in Seamanship and Rope Work.

### **3A.8 Examination for Boatmaster Grade 2 Licence**

The Administration, on approval of the Boatmaster Training Course, will determine any matters and procedures associated with the examinations for the issue of Boatmaster Grade 2 Licence.

The examination for a Boatmaster Grade 2 Licence consists of two parts. The first is an Oral Examination in which the candidates will be tested on their knowledge of Safety, Navigation, Rule of the Road and Seamanship, and response to certain Emergency Situations. The second part consists of a Practical Test carried out on the size of vessel for which the candidate is seeking to be licensed. This test requires the candidates to demonstrate an ability to handle the vessel in various circumstances.

A candidate passing only one part of the examination is allowed to retain the pass on that part for a period of one (1) year subject to the candidate being the holder of a valid Medical Certificate when re-sitting the other part.

**SECTION 3**  
**BOATMASTER GRADE 2**  
**PART B- COURSE OUTLINE**

**3B. 1 Syllabus for Training Course for Boatmaster Grade 2**

<b>Subject Area</b>	<b>Theory (Hrs)</b>	<b>Practical (Hrs)</b>
<b>1. <u>Emergency Situations</u></b>		
1.1 Search and Rescue techniques in bad weather or reduced visibility	1	2
1.2 Choosing an appropriate area for beaching	1	1
<b>2. <u>Regulations for Preventing Collision at Sea</u></b>		
2.1 A full knowledge of the Regulations for Preventing Collision at Sea	2	3
2.2 Keeping a Deck Log	0.5	0.5
<b>3. <u>Distress Signals</u></b>		
3.1 A knowledge of the contents of Annex IV of the Collision Regulation and operation of the signals and equipment required to be carried in the applicant's vessel	1	2
3.2 Coast Guard response to distress signals	0.5	0.5
<b>4. <u>Local Knowledge and Regulation</u></b>		
4.1 Action to be taken in the event of injury or loss of life	1	1
4.2 Certification required by the vessel	0.5	0.5
<b>5. <u>Radio and Radio Communication</u></b>		
Knowledge of marine radios and methods of communication	0.5	1
<b>6. <u>The Magnetic Compass</u></b>		
Knowledge and use of the magnetic compass	0.5	1
<b>7. <u>Chart Work</u></b>		
7.1 The meaning of common chart symbols	1	1
7.2 The use of Tidal Diamonds	1	1

<b>Subject Area</b>	<b>Theory (Hrs)</b>	<b>Practical (Hrs)</b>
<b>8. <u>Electronic Aids to Navigation</u></b>		
8.1 Knowledge of the use of Radar, Echo Sounder and Satellite Navigation or other position finding device fitted on board the applicant's vessel	2	4
<b>9. <u>Seamanship</u></b>		
9.1 Securing and storage of anchors and cables	1	1
9.2 Selection of a proper anchorage	0.5	1
9.3 The difference in handling a single and twin screw vessels	1	1
<b>10. <u>Passenger Safety</u></b>		
10.1 Knowledge of methods of orderly evacuation following an emergency, having regard to the size of the vessel concerned and its area of operation	0.5	0.5
<b>11. <u>Basic Knowledge of Vessel Construction and Stability</u></b>		
11.1 Knowledge of the effect of severe wind and rolling in associated sea conditions, especially in following seas	1	-
<b>12. <u>Prevention of Pollution</u></b>		
12.1 Knowledge of the factors contributing and precautions to be observed to prevent marine pollution when pumping out bilges and changing lubricating oil	1	-
<b>11. <u>Review and Assessment</u></b>		
SUB-TOTALS	2	
<b>TOTAL NO. OF HOURS - 42 (7 Days)</b>	19	23

**SECTION 3  
BOATMASTER GRADE 2**

**PART C - COURSE TIME TABLE**

**Week 1 [(T) = Theory and (P) = Practical]**

<b>Period</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>
1. (1hr.)	Regulations for preventing collision at sea (T)	Use of tidal diamonds (P)	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (P)	A knowledge of the contents of Annex IV of the Collision Regulations and operation of signals and equipment required to be carried on applicant's vessel (P)	Securing and storage of anchors and cables (T)
2. (1hr.)	Regulations for preventing collision at sea (P)	Chart symbols (P)	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (P)	A knowledge of the contents of Annex IV of the Collision Regulations and operation of signals and equipment required to be carried on applicant's vessel (P)	The difference in handling a single and twin screw vessels (T)
3. (1hr.)	Regulations for preventing collision at sea (P)	Radio and radio communication(T)/The magnetic compass	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (P)	Coast Guard response to distress signals (T)/Coast Guard response to distress signals (P)	Search and rescue techniques in bad weather or reduced visibility (T)
4 (1hr.)	Regulations for preventing collision at sea (P)	Certification required by the vessel (T)/Certification required by the vessel (P)	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (P)	Action to be taken in the event of injury or loss of life (T)	The magnetic compass (P)
5. (1hr.)	Chart symbols (T)	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (T)	Keeping a deck log (T)/Keeping a deck log (P)	Action to be taken in the event of injury or loss of life (P)	The difference in handling a single and twin screw vessels (T)
6. (1hr.)	Use of tidal diamonds (T)	Knowledge of use of Radar, Echo Sounder and Satellite Navigator or other position fixing devices (T)	Knowledge Annex IV of the Collision Regs. and operation of signals and equipment on the vessel (T)	Knowledge of the effect of severe wind and rolling in associated sea conditions ,especially following seas (T)	Securing and storage of anchors and cables (T)

**BOATMASTER GRADE 2**

**COURSE TIME TABLE**

**Week 2 [(T) =Theory and (P) = Practical]**

<b>Period</b>	<b>Day 1</b>	<b>Day 2</b>			
1. (1hr.)	Knowledge of methods of orderly evacuation following an emergency, having regard to the size of vessel concerned and its area of operation (T)	Knowledge of the effect of severe wind and rolling in associated sea conditions, especially in following seas (T)			
2. (1hr.)	Knowledge of methods of orderly evacuation following an emergency, having regard to the size of vessel concerned and its area of operation (P)	Search and rescue techniques in bad weather and reduced visibility (P)			
3. (1hr.)	Selection of a proper anchorage (T)	Search and rescue techniques in bad weather and reduced visibility (P)			
4. (1hr.)	Search and rescue techniques in bad weather and reduced visibility (T)	Knowledge of factors contributing, and precautions to be observed, to prevent marine pollution when pumping out bilges and when changing lubricating oil (T)			
5. (1hr.)	Selection of a proper anchorage (P)	Review and Assessment			
6. (1hr.)	Radio and radio communication(P)	Review and Assessment			

**BOATMASTER GRADE 2**

**PART D – DETAILED TEACHING SYLLABUS**

The teaching syllabus is prepared in learning objective format in which the objective describes what the trainee must do to demonstrate that knowledge has been transferred.

All objectives are understood to be prefixed by the words *“The expected learning outcome is that the trainee .....*”

**Boatmaster Grade 2**

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
<b>1</b>	<b>Emergency Situations (5 hours)</b>		
<b>1.1</b>	<b>Search and rescue techniques in bad weather or reduced visibility</b> <ol style="list-style-type: none"> <li>1. recognizes and understands                             <ul style="list-style-type: none"> <li>- sound signals</li> <li>- different types of flares and their use</li> </ul> </li> <li>2. is able to                             <ul style="list-style-type: none"> <li>- communicate using VHF radio</li> <li>- operate the radar and interpret images and signals</li> <li>- navigate and manoeuvre vessel</li> </ul> </li> </ol>	Nautical Knowledge for Fisherman pages 68-73	
<b>1.2</b>	<b>Choosing an appropriate area for beaching</b> <ol style="list-style-type: none"> <li>1. explains that:                             <ul style="list-style-type: none"> <li>- beaching of the vessel is a deliberate action after a collision or accident</li> <li>- preference in selecting a beach or shallow location rather than deep water for beaching</li> <li>- approaching the beach at slow speed at right angles to the line of the beach</li> <li>- stopping of the engine in good time to slow down the vessel</li> </ul> </li> </ol>	Nicholls’s Seamanship and Nautical Knowledge Chapter X	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	<ul style="list-style-type: none"> <li>- the beach should be of sand or gravel rather than rock</li> <li>- a sheltered position is preferable if possible</li> <li>- beach on a falling tide if possible to allow for securing of vessel</li> <li>- the beaching of the vessel towards the shore</li> <li>- securing of vessel</li> </ul>		
<b>2.</b>	<b>Regulations for Preventing Collision at Sea (6 hours)</b>	Yacht Master- Pages 40-44	
<b>2.1</b>	<b>A full knowledge of the Regulations for Preventing Collision at Sea</b> <ol style="list-style-type: none"> <li>1. explains and demonstrates understanding of the Rules of the Road to include: <ul style="list-style-type: none"> <li>- a proper look out</li> <li>- identification of vessel types and activities</li> <li>- identification of vessel lights, signals and shapes and sounds</li> <li>- overtaking, giving way passing and crossing</li> <li>- dealing with situations of restricted visibility</li> <li>- navigation lights, buoyage systems and markers especially in the areas of operation</li> </ul> </li> </ol>	A Seaman's Guide to the Rules of the Road  Nicholl's Seamanship and Nautical Knowledge Chapter 9  Brown's Manual of Rules of the Road	
<b>2.2</b>	<b>Keeping a Deck Log</b> <ol style="list-style-type: none"> <li>1. explains and understands entries into the Deck Log Book details of: <ul style="list-style-type: none"> <li>- circumstances relating to marine casualties and death</li> <li>- voyage details including positions, courses, weather conditions and types of drills undertaken</li> </ul> </li> </ol>	Nicholl's Seamanship and Nautical Knowledge pages 390-391	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	<ul style="list-style-type: none"> <li>- persons who may cease to be a member of the crew with information on time, place and causes</li> <li>- all other relevant occurrences and incidents during the voyage</li> </ul>		
<b>3.</b>	<b>Distress Signals (4 hours)</b>	Nicholl's Seamanship and Nautical Knowledge pages 47-48	
<b>3.1</b>	<p><b>A knowledge of the content of Annex IV the Collision Regulation and operation of the signals and equipment required to be carried on the applicant's vessel</b></p> <ol style="list-style-type: none"> <li>1. explains and demonstrates knowledge of: <ul style="list-style-type: none"> <li>- the use and operation of distress flares</li> <li>- sound signals such as S.O.S , MAYDAY and PAN PAN</li> <li>- Search and Rescue Transponders(SART)</li> <li>- Emergency Position Indicating Radio Beacon (EPIRB)</li> <li>- emergency calls using VHF and other communication systems</li> </ul> </li> </ol>	Yacht Master- Pages 52-53	
<b>3.2</b>	<p><b>Coast Guard response to distress signals</b></p> <ol style="list-style-type: none"> <li>1. explains <ul style="list-style-type: none"> <li>- that Coast Guard monitors emergency radio frequencies</li> <li>- the need to provide position of own vessel</li> <li>- that Coast Guard will give position of vessel closest to incident</li> <li>- that Coast Guard will request full report of incident including injuries,</li> </ul> </li> </ol>		

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	casualties and deaths that Coast Guard will request information of type of assistance required		
<b>4.</b>	<b>Local Knowledge and Regulations (3 hours)</b>		
<b>4.1</b>	<b>Action to be taken in the event of injury or loss of life</b> 1. explains: <ul style="list-style-type: none"> <li>- the need for emergency medical/first aid and response on board</li> <li>- the need to contact priority agencies such as rescue authorities, vessel agent and owners</li> <li>- to be knowledgeable of the closest port of entry in the locality of the incident</li> <li>- helicopter rescue</li> <li>- how the make log Book entry report</li> </ul>		
<b>4.2</b>	<b>Certification required by the vessel</b> 1. Lists <ul style="list-style-type: none"> <li>- the types of certificates required by the Maritime Administration</li> <li>- how they are obtained and the renewals if applicable to include Registration and Certification; Certificate of Inspection under the SCV Code; Loadline</li> <li>- Deratting;</li> </ul>	Nicholls's Seamanship and Nautical Knowledge Chapter 15	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
<b>5.</b>	<b>Radio and Radio Communication (1.5 hours)</b>	Small Ships Radio Telephone Handbook	
<b>5.1</b>	<b>Knowledge of marine radios and methods of communication</b> 1. demonstrates - competency through being the holder of a VHF Radiotelephone Operator Licence approved by the Maritime Administration	Handbook for Radio Operators  Nautical Knowledge for Fisherman pages 14-22	
<b>6.</b>	<b>The Magnetic Compass (1.5 hours)</b>	The Magnetic Compass: Deviation and Correction Chapter 4	
<b>6.1</b>	<b>Knowledge and use of the magnetic compass</b> 1. understands and explains: - the construction and operation of the magnetic compass - the effects of ferrous material, magnetic field and electro-magnetism on the magnetic compass - the compass rose and points - magnetic north - true north - variation - deviation - corrections for deviation and variation - use of deviation tables	Yacht Master Pages 8-9  An Introduction to Coastal Navigation – A Seaman’s Guide Chapter 2	
<b>7.</b>	<b>Chart Work (4 hours)</b>	Nautical Charts, Symbols and Abbreviations	
<b>7.1</b>	<b>The meaning of common chart symbols</b> 1. identifies and explains chart features: - title - catalogue number - scale	Yachtmaster pages 1-3	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	<ul style="list-style-type: none"> <li>- projection</li> <li>- latitude</li> <li>- latitude scale</li> <li>- longitude</li> <li>- longitude scale</li> <li>- tidal diamonds</li> <li>- tidal heights</li> </ul> <p>2. interprets chart symbols such as</p> <ul style="list-style-type: none"> <li>- contours</li> <li>- beacons</li> <li>- harbours</li> <li>- wrecks</li> <li>- dangerous areas</li> <li>- tidal streams</li> <li>- buoys</li> <li>- cliffs</li> <li>- battery/forts</li> <li>- buildings</li> </ul>		
<b>7.2</b>	<p><b>Tidal Diamonds</b></p> <p>1. explains</p> <ul style="list-style-type: none"> <li>- the use tidal diamonds to interpret set and drift of tidal streams</li> </ul>	An Introduction to Coastal Navigation	
<b>8.</b>	<p><b>Electronic Aids to Navigation (6 hours)</b></p>	<p>Yachtmaster pages 30-35</p> <p>Radar Observers Handbook for Merchant Navy Officers</p>	
<b>8.1</b>	<p><b>Knowledge of the use of Radar, Echo/Depth Sounder, Satellite Navigation/GPS or other position fixing device fitted on board the vessel</b></p> <p>1. explains working principles of the radar including exercises with the instrument in terms of:</p> <ul style="list-style-type: none"> <li>- definition and description</li> <li>- displays</li> <li>- settings</li> <li>- range and bearing</li> <li>- echoes</li> </ul>	<p>American Practical Navigator – Vol. 1 pages 156-160 972 983-990 1066-1070</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	<ul style="list-style-type: none"> <li>- brilliance / gain</li> <li>- targets in relation to size, shape etc</li> <li>- effects of motion of ship</li> <li>- operations in restricted visibility or the dark</li> <li>- collision avoidance</li> <li>- navigation</li> </ul> <p>2. explains the working principles of the echo/depth sounder including exercises with the instrument in terms of:</p> <ul style="list-style-type: none"> <li>- definition, description and capabilities</li> <li>- the concept of sound reflection in relation to the ocean bottom</li> <li>- range</li> <li>- depth measurement and interpretation of sound reflection</li> <li>- image and image interpretation</li> </ul> <p>3. explains the principles of the Global Positioning System (GPS) through exercises with a GPS Unit:</p> <ul style="list-style-type: none"> <li>- that the GPS receiver obtains a fix through signals from orbiting satellites</li> <li>- GPS displays, common terms and interpretations</li> <li>- latitude and longitude</li> <li>- positions given by GPS</li> </ul>		
<b>9.</b>	<b>Seamanship (5.5 hours)</b>		
<b>9.1</b>	<b>Securing and storage of anchors and cables</b>	Accident Prevention on Board Ship and in Port	
	1. understands:	Page 27	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
	<ul style="list-style-type: none"> <li>- the periodic testing of anchors and cable</li> <li>- routine maintenance of cables, anchors and windlasses</li> <li>- defects of anchors, cables and chains</li> </ul> <p>2. explains:</p> <ul style="list-style-type: none"> <li>- the securing of anchors and cables when not in use by stoppers</li> </ul> <p>3. knows that:</p> <ul style="list-style-type: none"> <li>- stoppers should not be removed until it is intended to heave or raise anchors</li> </ul> <p><b>9.2 Selection of a proper anchorage</b></p> <p>1. explains :</p> <ul style="list-style-type: none"> <li>- selection of a proper anchorage involves safety of vessel, personnel and equipment</li> <li>- sheltered location in terms of maximum protection from wind , swell and tide</li> <li>- the need to know tide times and height to avoid grounding as tide falls</li> <li>- the need to make allowances for swing in relation to other boats, rocks, etc</li> <li>- the amount of warp/anchor chain needed for the location</li> <li>- type of sea bed in terms of mud, sand which provide better holding than rock</li> <li>- to avoid anchoring on or near traffic lanes</li> </ul>	<p>Day Skipper –Pages 20-21</p>	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
<b>9.3</b>	<p><b>The difference in handling a single and twin screw vessel</b></p> <ol style="list-style-type: none"> <li>1. explains <ul style="list-style-type: none"> <li>- the concept and operation of a the single screw propeller</li> <li>- the concept and operation of the twin screw propeller in relation to: <ul style="list-style-type: none"> <li>▪ single and twin screws</li> <li>▪ wake current</li> <li>▪ transverse thrust</li> <li>▪ screw race -fore and aft action</li> <li>▪ probable resultant of wake current, transverse thrust and screw race</li> </ul> </li> </ul> </li> </ol>	Nicholl's Seamanship and Nautical Knowledge pages 214-216	
<b>10.</b>	<b>Passenger Safety(1 hour)</b>		
<b>10.1</b>	<p><b>Knowledge of methods of orderly evacuation following an emergency, having regard to the size of the vessel and area concerned and the area of operation</b></p> <ol style="list-style-type: none"> <li>1. knows : <ul style="list-style-type: none"> <li>- Personal Survival techniques</li> </ul> </li> <li>2. explains <ul style="list-style-type: none"> <li>- the need to have passenger list</li> <li>- the appropriate emergency announcements</li> <li>- the need to establish muster station and the manning of muster stations</li> <li>- the location of all emergency exits</li> <li>- the location of all lifesaving appliances and equipment</li> <li>- instruct passengers to don jackets</li> </ul> </li> </ol>	Crowd Management and Safety Training for Personnel providing Direct Service to Passengers in Passenger Spaces - IMO Model Course 1:28	

	<b>Learning Objectives</b>	<b>Reference/Teaching Aids</b>	
<b>11.</b>	<b>Basic Knowledge of Vessel Construction and Stability (1 hour)</b>	Principles and Practices of Ship Stability pages 140-144	
<b>11.1</b>	<b>Knowledge of the effect of severe wind and rolling in associated sea conditions, especially in following seas.</b> <ol style="list-style-type: none"> <li>1. explains stability in relation to: <ul style="list-style-type: none"> <li>- trim</li> <li>- heel</li> <li>- rolling</li> <li>- righting</li> <li>- running</li> <li>- breaking waves</li> </ul> </li> </ol>	Nicholl's Seamanship and Nautical Knowledge Chapters 12 and 14	
<b>12.</b>	<b>Prevention of Pollution (1 Hour)</b>		
<b>12.1</b>	<b>Knowledge of the factors contributing and precautions to be observed to prevent marine pollution when pumping out bilges and changing lubricating oil.</b> <ol style="list-style-type: none"> <li>1. explains <ul style="list-style-type: none"> <li>- that bilge water and used lubricating oil cause marine pollution</li> <li>- it is prohibited to pump out bilge water and used lubricating oil in the sea except in locations designated by the Maritime Administration</li> <li>- the bilge water and used lubricating oil must be stored in holding tanks for disposal at designated locations</li> </ul> </li> </ol>	Oil Pollution from Ships Chapters 2 and 4	
<b>13</b>	<b>Review and Assessment (2 Hours)</b>		

## BOATMASTER GRADE 2

### REFERENCES FOR MODEL TRAINING COURSE

1. DAY SKIPPER- INTRODUCTION TO NAVIGATION THEORY, SAFETY AND SEAMANSHIP 2,002. Prepared by Penny Haire, illustrated by Sarah Selman. Royal Yacht Association, RYA House, Ensign Way, Hamble, Southampton SO31 4YA, United Kingdom.  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
2. YACHTMASTER- ADVANCED NAVIGATION THEORY , SAFETY AND SEAMANSHIP, 2002. Prepared by Penny Haire, illustrated by Sarah Selman. Royal Yacht Association, Romsey Road, Eastleigh, Hampshire SO50 9YA.  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
3. NICHOLLS'S SEAMANSHIP AND NAUTICAL KNOWLEDGE, 1979. Revised by A.N. Cockcroft, F.R.I. M, Extra Master. Brown, Son and Ferguson Ltd., Nautical Publications, 52 Darnley Street, G41 2SG, Glasgow.
4. A SEAMAN'S GUIDE TO THE RULES OF THE ROAD , 2003. Morgan Technical Books Ltd., Wotton Under Edge, Gloucestershire, United Kingdom.
5. AN INTRODUCTION TO COASTAL NAVIGATION – A SEAMAN'S GUIDE, 1992. Morgan Technical Books Ltd, P.O. Box 5, The Stables, Darnley, Wotton Under Edge, Gloucestershire, United Kingdom.
6. BROWN'S MANUAL OF RULES OF THE ROAD, 1998: The Rules of the Road. Revised by H.H. Brown, D.Sc. R.D., F.R.A. S. Brown , Son and Ferguson Ltd., 4-10 Darnley Street, Glasgow.
7. NAUTICAL KNOWLEDGE FOR FISHERMEN. Capt. Alexander Simpson, B.Sc., Extra Master. Brown, Son and Ferguson Ltd., 52 Darnley Street, Glasgow.
8. SMALL SHIPS RADIO TELEPHONE HANDBOOK, 1969-1970 (Revised). R.A.H Collins, A.M.I.T.E, Thos Cooper F.C.C.S. Fishing Books (News) Ltd, 110 Fleet Street, London E.C.4.
9. HANDBOOK FOR RADIO OPERATORS , 1985 (15<sup>th</sup> Edition). Lloyd's of London Press
10. NAUTICAL CHARTS, SYMBOLS AND ABBREVIATIONS, 1984 (8<sup>th</sup> Edition). Prepared Jointly by US Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), US Department of Defence, Defence Mapping Agency, Hydrographic/ Topographic Centre. Published at Washington D.C. by Dept. of Commerce, NOAA and National Oceanic Service, Washington D.C., 20230
11. THE MAGNETIC COMPASS: DEVIATION AND CORRECTION, 1983. W. Denne, Extra Master, F.R.A.S, M.M. Brown, Son and Ferguson Ltd., Nautical Publishers, 52 Darnley Street, Glasgow.
12. RADAR OBSERVERS HANDBOOK FOR MERCHANT NAVY OFFICERS., 1983 (7<sup>th</sup> Edition). W. Burger M.Sc. Extra Master, F.M. Brown, Son and Ferguson Ltd., Nautical Publishers, 4-10 Darnley Street, Glasgow, G41, 2 SD.
13. AMERICAN PRACTICAL NAVIGATOR. Nathaniel Bodwitch, L.L.D. Published by The Defense Mapping agency Hydrographic/ Topographic Center, Washington D.C. 20315.

14. PRINCIPLES AND PRACTICES OF SHIP STABILITY, 1984. Capt. L.G. Taylor. Brown, Son and Ferguson Ltd., 4-10 Darnley Street, Glasgow.
15. ACCIDENT PREVENTION ON BOARD SHIP AND IN PORT 1986. International Labour Organization
16. IMO MODEL COURSE 1:28 - CROWD MANAGEMENT AND SAFETY TRAINING FOR PERSONNEL PROVIDING DIRECT SERVICE TO PASSENGERS IN PASSENGER SPACES
17. OIL POLLUTION FROM SHIPS: International, United Kingdom and the United States Law and Practice, 1985 (2<sup>nd</sup> Edition) by David W. Abecassis M.A, Ph. D and Richard J. Jarashow J.D., L.L. M.

**BOATMASTER GRADE 2**  
**PART E - INSTRUCTOR'S MANUAL**

**Introduction**

The instructor manual provides guidance on the material that is to be presented during the course. The course material reflects the requirements for the training of Boatmaster 2 in accordance with **Annex 11** of the SCV Code.

The material has been arranged under twelve (12) main headings:

1. Emergency Situations
2. Regulations for Preventing Collision at Sea
3. Distress Signals
4. Local Knowledge and Regulations
5. Radio and Radio Communications
6. The Magnetic Compass
7. Chart Work
8. Electronic Aids to Navigation
9. Seamanship
10. Passenger Safety
11. Basic Knowledge of Vessel Construction and Stability
12. Prevention of Pollution
13. Review and Assessment

The course outline and time table which include both theoretical and practical sessions provide guidance and time allocations for the course materials. However, as noted earlier in **Section 1.2**, the instructor is free to make adjustments as necessary to facilitate circumstances which may be peculiar to the situation and environment. The detailed teaching syllabus must be studied

carefully and lesson plans or lecture notes compiled where appropriate in accordance with Part D –Detailed Teaching Syllabus at page 47.

In addition, the class size in terms of ratio of instructor to trainee is limited to 1:15 for theoretical sessions and 1:10 for practical sessions to facilitate ease of instructions.

In relation to practical and other specialized aspects of the training, the instructor is advised to fully acquaint and inform trainees in good time of particular requirements.

### **Bibliography**

The attention of the instructor is drawn to bibliographical references to ten of the main subject areas as noted in Part D – Detailed Teaching Syllabus, pages 47-56 and the complete list of references at pages 57-58.



### **3. Distress Signals**

**4 Hours**

#### **3.1 A Knowledge of the Content of Annex IV of the Regulations and Operation of Signals and Equipment Required to be Carried on the Applicant Vessel.**

The instructor should ensure that the trainees is fully acquainted and knowledgeable of Annex IV of the Collision Regulations. As many methods of instruction as appropriate must be employed in this exercise. Emphasis should be on the trainee being able to demonstrate his knowledge and competence to the satisfaction of the instructor.

#### **3.2 Coast Guard Response to Distress Signals**

It must be explained to the trainee that the Coast Guard, as a routine exercise, monitors emergency radio frequencies and the operation and movement of ships and shipping to allow for immediate responses in the event of emergencies in their designated area of operation. He must also be taught how to respond to the Coast Guard in terms of communication and responsibility as one being in charge of a vessel.

### **4. Local Knowledge and Regulations**

**3 Hours**

#### **4.1 Action to be taken in the event of injury or loss of life**

The instructor must explain to the trainee the necessary and appropriate actions which should be taken in event of injury or loss of life as these may relate to responses associated with the medical emergencies, communication with the relevant authorities, seeking assistance from emergency response agencies and the preparation of the appropriate reports.

#### **4.2 Certification Required by the Vessel**

In this exercise the trainee must be knowledgeable of all the certificates which may be required by the vessel, how they are obtained and also renewal frequency where necessary. Copies and/or samples of all these certificates should be made available to the trainee as teaching tools.

### **5. Radio and Radio Communications**

**1.4 Hours**

#### **5.1 Knowledge of Marine Radios and Methods of Communication**

The trainee should be instructed and trained and be the holder of a Radio Operators Licence approved by the Maritime Administration as a means of demonstration of competence in this area.

**6. The Magnetic Compass** **1.5 Hours**

**6.1 Knowledge of the Magnetic Compass**

The trainee must have a complete knowledge of the magnetic compass in terms of its construction, operation and the effects of magnetic and electrical fields on its efficient functioning. The concepts magnetic north and true north should be explained and demonstrated by the instructor. The concepts of deviation and variation must be fully explained and demonstrated in addition to their corrections and their use of deviation tables. Practical exercises should be conducted in these areas to allow for the attainment of a level of competence satisfactory to the instructor.

**7. Chart Work** **4 Hours**

**7.1 The Meaning of Common Chart Symbols**

The instructor, in addition to explaining chart symbols in terms of their meaning, use and application, would use actual charts to support the presentation. The trainee must demonstrate to the instructor that he understands fully chart symbols and their meanings.

**7.2 Tidal Diamonds**

The instructor in defining and explaining the concept of tidal diamonds would demonstrate and illustrate to the trainee their application in the interpretation of set and drift of tidal streams in navigation.

**8. Electronic Aids to Navigation** **6 Hours**

**8.1 Knowledge of the Use of Radar, Echo/Depth Sounder, Satellite Navigation/GPS, or Other Fixed Devices on Board Vessel**

The instructor in addition to defining and explaining the construction, operation and working principles of the various electronic aids would also teach and demonstrate their application in the safe navigation of a vessel especially in relation to their accuracy and limitations. The trainee at the end of the sessions should be able to demonstrate an acceptable level of competence to the instructor.

## **9. Seamanship**

**5.5 Hours**

### **9.1 Securing and Storage of Anchors and Cables**

The trainees should be taught of the need for proper securing, storage and maintenance of anchors and cables so that they would always be ready for use even in an emergency. The need to be able to identify defects in the equipment and conduct the necessary repairs in good time should also be emphasized. Practical demonstration and exercises should form an important part of this item.

### **9.2 Selection of a Proper Anchorage**

It should be emphasized to the trainee that in the selection of a proper anchorage, consideration must be given to the safety of the vessel, crew and passengers and equipment. The effects of weather, tides, waves, swing of the vessel, anchoring equipment, the proximity to other vessels and obstructions on safe anchorage must also be explained. The importance of selecting the type of seabed, where practicable, to enhance the holding efficiency of the type of anchor being used. In addition, the dangers of anchoring in a sea lane must be explained along with the necessary precautions which must be observed in the anchoring exercise..

### **9.3 The Difference between Handling a Single and Twin Screw Vessel**

An explanation of the principles of single and twin screw propulsion and the operational differences between a vessel fitted with a single and a twin screw propulsion should be explained to the trainee. The differences in performance of vessels operating with single and twin screw should also be explained and practical demonstrations should be conducted.

## **10. Passenger Safety**

**1 Hour**

### **10.1 Knowledge of Methods of Orderly Evacuation Following an Emergency, Having Regard to the Size of the Vessel and Area Concerned and the Area of Operation**

The instructor should ascertain that the trainee is familiar and competent with Personal Survival Techniques. A full explanation should be given to the trainee regarding the possible dangers and risks which may be associated with the evacuation of passengers and also the necessary actions and their sequences in undertaking this exercise. This should be in relation to the specific vessel type, its equipment and area of operation.

## **11 Basic Knowledge of Vessel Construction and Stability I Hour**

### **11.1 Knowledge of the Effect of Severe Wind and Rolling in Associated Sea Conditions, especially Following Seas**

The stability of a vessel must be defined, in addition to the factors which may operate either singly or in combination to result in instability. The need for vessel stability to ensure safe operation and safety of navigation must be explained to the trainee in addition to the methods which may be applied to correct vessel instability and establish and maintain vessel stability. Vessel construction in relation to vessel stability must also be explained to the trainee. The use of models and other appropriate teaching aids must be utilized to demonstrate the causes of instability and corrective methods.

## **12. Prevention of Pollution 1 Hour**

### **12.1 Knowledge of the Factors Contributing and Precautions to be observed to prevent Marine Pollution when Pumping out bilges and Changing Lubricating Oil.**

Marine pollution as caused by the pumping of bilge and oily water over board must be explained, in addition to the local regulations and penalties governing the disposal of these types of waste. The storage of these material on board a vessel until it is appropriate to discharge them must also be explained and demonstrated to the trainee

## **13. Review and Assessment**

The instructor should briefly review the course content, stressing those areas of importance in each subject area especially those which promote operational safety. Informal discussion among trainees and instructor is encouraged where appropriate. A final evaluation of the trainees' learning objectives should be conducted by a combination of practical demonstrations to establish an agreed level of competence and written tests.

## EXAMPLE OF A LESSON PLAN

**COURSE:** Boatmaster Grade 2      **Lesson Number**      **Duration:** 90 Minutes  
**TRAINING AREA:** The Magnetic Compass

MAIN ELEMENT Specific learning objective (in teaching sequence with memory keys)	Teaching Method	Text Book Reference	A/V Aids	Instructor Guidelines	Time (Mins)
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### 6. The Magnetic Compass

#### 6.1 Knowledge of the magnetic Compass

- |   |                   |  |  |                    |    |
|---|-------------------|--|--|--------------------|----|
| 1. Construction of the magnetic compass <ul style="list-style-type: none"> <li>- the structure of the magnetic compass and its component parts</li> <li>- the role and function of component parts of the magnetic compass</li> </ul>   | Classroom lecture | Yacht Master Pages 8-9   |  | Instructor's Notes | 10 |
| 2. Use of the magnetic compass <ul style="list-style-type: none"> <li>- an aid to navigation</li> <li>- the compass rose and its division into minutes and seconds</li> <li>- magnetic north and true north</li> <li>- the effects of earth magnetism and electro-magnetism on the magnetic compass</li> <li>- errors in compass readings as a result of earth and electro-magnetism</li> <li>- deviation</li> <li>- variation</li> </ul> | Classroom lecture | An Introduction to Coastal Navigation- A Seaman's Guide- Chapter 2 |  | Instructor's Notes | 30 |

<p>3. Correction of compass errors</p> <ul style="list-style-type: none"> <li>- calculation of compass errors due to deviation</li> <li>- calculation of compass errors due to variation</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>40</p>
<p>4. Deviation tables</p> <ul style="list-style-type: none"> <li>- use of deviation tables to correct magnetic compass errors</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>10</p>

## **BOATMASTER GRADE 2**

### **PART F - EVALUATION**

#### **Introduction**

The effectiveness of any evaluation depends upon the accuracy of the description of what is to be measured.

The learning objectives used in the detailed syllabus will provide a sound basis for the construction of suitable tests for evaluating the trainee progress.

#### **Method of Evaluation**

The methods chosen to carry out an evaluation will depend on what the trainee is expected to achieve in terms of knowing, comprehending and applying the course content.

The methods used can range from simple question and answer discussion with the trainee (either individually or as group), or prepared tests requiring the selection of correct or best responses from given alternatives, the correct matching of given items, the supply of short answer or the supply of more extensive written responses to prepared questions.

Where the course content is aimed at the acquisition of practical skills, the test would involve a practical demonstration by the trainee making use of appropriate equipment, tools, etc.

The responses demanded may therefore consist of:

- *the recall of facts, information by viva-voce or objective tests*
- *the practical demonstration of an attained skill*
- *the oral or written description of procedures or activities*
- *the identification and use of data from sketches, drawings, maps, charts, etc*
- *carrying out of calculations to solve numerical problems*
- *the writing of an essay report.*

## **Validity**

The evaluation must be based on clearly defined objectives, and it must truly represent what is to be measured. There must be a reasonable balance between the subject topic involved and also in the testing of trainee's knowledge, comprehension and application of concepts.

The time allocation for the trainee to provide a response is very important. Each question or task must be properly tested and validated before it is used to ensure that the test will provide a fair and valid evaluation.

## **Reliability**

To be reliable, an evaluation procedure should produce reasonably consistent results no matter which set of papers or version of the test involved is used.

## **Subject Testing**

Traditional methods of evaluation require the trainee to demonstrate what has been learned by stating or writing formal answers to questions.

Such evaluation is subjective in that it invariably depends upon the judgment of the evaluator. Different evaluators can produce quite different scores when marking the same paper or evaluating oral answers.

## **Objective Testing**

A variety of objective tests have been developed over the years . Their common feature is that the evaluation does not require a judgment by the evaluator. The response is either right or wrong.

One type of objective test involves supplying an answer, generally a single word, to complete the missing portion of a sentence. Another involves supplying a short answer of two or three words to a question. Such tests are known as 'completion tests, and 'short answer tests'.

Another form of objective testing consists of 'selective response tests' in which the correct, or best response must be selected from given alternatives. Such tests may consist of ' matching tests,' in which items contained in two separate lists must be matched, or they may be of the true/false type or of the multiple choice type.

The most flexible form of objective test is the multiple choice test, which presents the trainee with a problem and a list of alternative solutions, from which he must select the most appropriate.

## **Distracters**

The incorrect alternatives in multiple-choice questions are called ‘distracters’, because their purpose is to distract the uninformed trainee from the correct response. The distracter must be realistic and should be based on misconceptions commonly held, or on mistakes commonly made.

The options “none of the above” or “all of the above” are used in some tests. These can be helpful, but should be used sparingly.

Distracters should distract the uninformed, but they should not take the form of “trick” questions that could mislead the knowledgeable trainee (for example, do not insert a correct response to make it a distracter).

## **Guess Factor**

The ‘guess factor’ with four alternative responses in a multiple-choice test would be 25%. The pass mark chosen for all selective-response questions should be taken into account.

## **Scoring**

In simple scoring of objective tests one mark may be allotted to each correct response, zero for a nil-response and minus one for an incorrect response. Where a multiple-choice involves four alternatives, this means that a totally uninformed guess involves a 25% chance of gaining one mark and a 75% chance of losing one mark.

Scores can be weighted to reflect the relative importance of questions, or of sections of an evaluation.

## SECTION 4

### BOATMASTER GRADE 1

#### PART A – COURSE FRAMEWORK-

##### 4A.1 Aim

The Training Course for Boatmaster Grade 1 aims to provide training for persons intending to be in command of the following vessels in areas designated by the Administration.

1. a passenger vessel up to 24 m operating in Coastal Waters;
2. any vessel other than a passenger vessel of less than 24m operating in Exposed Waters.

##### 4A.2 Objective

The syllabus for the training of Boatmaster Grade 1 covers the requirements given at Annex 11 of the SCV Code. The candidate, on completing the Training Course for Boatmaster Grade 1 and having been successful in the examination conducted by the Administration, will be deemed competent and licensed as a Boatmaster Grade 1.

##### 4A.3 Entry Requirements

A candidate seeking entry to the training course for Boatmaster Grade 1 must:

- be not less than twenty –one (21) years of age on completion of the course;
- be certified as being medically fit in accordance with the Shipping Medical Examination Regulations;
- be able to read, write and comprehend with some proficiency in Mathematics and English;
- have successfully completed the Training Course Boatmaster Grade 2 or be licensed as a Boatmaster Grade 2.

##### 4A.4 Course Certificate

On successfully completing the Training Course for Boatmaster Grade 1 the candidate may be issued a Certificate of Successful Completion by the Training Institution.

##### 4A.5 Course Intake

The level of individual attention which is required to be given by instructors will influence the maximum intake of trainees for the Training course. This will also be influenced by the availability of instructors, equipment and facilities. However, an

instructor to trainee ratio of not more than 1:15 for theoretical sessions and 1:10 for practical sessions are proposed.

#### **4A.6 Staff Requirements**

All training and instruction should be conducted by appropriately qualified personnel. The Senior Instructor should be the holder of a Chief Mate Certificate with training and experience as an instructor.

The average ratio of instructor to trainee as noted in **sub-section 4A.5 above** should always be borne in mind for theoretical and practical training.

#### **4A.7 Training Facilities and Equipment**

Classroom facilities should be available to accommodate the class size comfortably and provided with required equipment such as overhead projector, video players, flip charts and computers. Video tapes, computer generated materials and other similar aids appropriate for the course should also be available to supplement lecture notes and materials.

Ship models and lighting systems with lights of the appropriate colours and demonstration table should be available to support lectures in Regulations for the Prevention of Collision at Sea and Seamanship.

A functional and serviceable jetty and a fully equipped and operating vessel similar to that on which the successful candidate will function should be available to accommodate subject areas such as Boat Handling, Emergency Procedures, Regulations for the Prevention of collision at Sea, Seamanship, Passenger Safety and Engineering Knowledge. In addition, a Mechanical Workshop equipped with demonstration engines, tools and diagnostic equipment to support the area of Engineering Knowledge should be available.

#### **4A.8 Examination for Boatmaster Grade 1 Licence**

The Administration on approval of the Boatmaster Grade 1 Training Course will determine any matters and procedures associated with the examinations and for the issue of the Boatmaster Grade I Licence.

The examination for a Boatmaster Grade 1 Licence consists of three (3) parts. The first is an Oral examination in which the candidate will be tested on knowledge of Safety, Navigation, Rule of the Road, Seamanship and response to certain Emergency Situations. The second part consists of a Practical Test in Chart Work and the use of Electronics Aids to Navigation. The third part is a practical test carried out on a vessel of 12 – 24m in length. This test requires the applicant to demonstrate the ability to handle the vessel in various circumstances.

An applicant passing only one part of the examination should be allowed to retain the pass in that part for a period of one (1) year subject to the applicant being the holder of a valid Medical Fitness Certificate when re-sitting the other part.

Notwithstanding the separation of syllabi for the training of Boatmaster 2 and Boatmaster 1 which are at **sub-sections 3B.1 and 4B.1 respectively**, the Administration may allow a candidate to be examined for the Boatmaster Licence Grade 1 without being the holder of Boatmaster Licence Grade 2, provided that the candidate has successfully completed the syllabus of the Training Course for Boatmaster Grade 2 and satisfies any other conditions determined by the Administration.

## SECTION 4

### BOATMASTER GRADE 1

#### PART B- COURSE OUTLINE

#### 4B.1 IMO Model Course in Ship Security

A candidate who is undertaking the Boatmaster Grade 1 Training Course to be examined and licensed as a Boatmaster Grade 1 by the Administration must successfully complete IMO Model Course 3.19, Ship Security Officer, in addition to the syllabus which is outlined at sub-section 4B.2 below.

#### 4B.2 Syllabus for Training Course for Boatmaster Grade 1

Subject Area		Theory (Hrs)	Practical (Hrs)
<b>1.</b>	<b><u>Chart Work</u></b> <b>12 Hours</b>		
1.1	Deviation, Variation and Deviation Tables	1	1
1.2	Familiarity with the use of parallel rules, dividers, compasses etc	1	1
1.3	Position Fixing	1	2
1.4	Course to steer to allow for current and leeway	1	2
1.5	Passage Planning	1	1
<b>2.</b>	<b>Publications</b> <b>2 hours</b>		
2.1	Merchant Shipping Notices	0.5	-
2.2	Admiralty Charts	0.5	-
2.3	Tide Tables	0.5	-
2.4	Regulations (as applicable)	0.5	-
<b>3.</b>	<b>Buoyage System</b> <b>2.5 Hours</b>		
3.1	Full knowledge of navigation lights, buoys and restrictions in the area of operation	0.5	2
<b>4.</b>	<b>Ship's Business</b> <b>5.5 Hours</b>		
4.1	Preparation of Deck Log	0.5	0.5
4.2	Procedures for entering and leaving a Port	0.5	0.5
4.3	Crew List	0.5	0.5

<b>Subject Area</b>		<b>Theory (Hrs)</b>	<b>Practical (Hrs)</b>
4.4	Passenger List	0.5	0.5
4.5	Vessel Insurance	0.5	-
4.6	Report Preparation	0.5	0.5
<b>5.</b>	<b>Crowd Management</b>	<b>4.5 hours</b>	
5.1	Preparation and Operation of a Muster List	0.5	0.5
5.2	Knowledge and operation of emergency exits	0.5	0.5
5.3	Giving instructions in a crowd management situation	0.25	0.5
5.4	Evacuation of passengers	0.5	0.5
5.5	Communication in a crowd management situation	0.25	0.5
<b>6.</b>	<b>Basic Knowledge of Vessel Construction and Stability</b>	<b>11.5 hours</b>	
6.1	General ideas in ship construction and on plans available on board vessel and where they are kept	1	0.5
6.2	General principles of work boat stability	1	1
6.3	Outline knowledge of free board and trim	0.5	-
6.4	Maintaining water tight sub-division	0.5	-
6.5	General pumping arrangements	0.5	0.5
6.6	Heeling forces and their causes	0.5	-
6.7	Equilibrium on the heeled condition	0.5	-
6.8	Application and effects of asymmetric loading	0.5	0.5
6.9	Overtight mooring	0.5	0.5
6.10	Simple dynamic balance	0.5	0.5
6.11	Effect of liquid on free surface and its control	0.5	0.5
6.12	Cranes, their operation and safe operating limit	0.5	0.5
6.13	The use of stability and hydrostatic tables	0.5	0.5
<b>7.</b>	<b>Prevention of Pollution</b>	<b>0.5 Hour</b>	
7.1	A general appreciation of Regulations applicable to the prevention of pollution	0.5	-
<b>8.</b>	<b>Review and Assessment</b>	<b>2 Hours</b>	
SUB-TOTAL		<b>2</b>	<b>-</b>
<b>TOTAL NO. OF HOURS (42) 7 (Days)</b>		<b>22.5</b>	<b>19.5</b>

**SECTION 4**

**BOAT MASTER GRADE 1**

**PART C- COURSE TIME TABLE**

**Week 1 [ (T) = Theory and (P) = Practical]**

<b>Period</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>
1. (1hr.)	Deviation, variation and deviation tables (T)	Position fixing(P)	Merchant Shipping Notices (T)/Admiralty Charts(T)	Knowledge and operation of emergency exits(T)/Knowledge and operation of emergency exits(P)	Crew list(T)/Crew list(P)
2. (1hr.)	Deviation, variation and deviation tables(P)	Course to steer to allow for current and leeway (T)	Tide Tables(T)/ Regulations (as applicable)(T)	Communication in crowd management situations(T)/Communication in crowd management situations(P)Giving instructions in crowd management situations (T)	Passenger list (T)/ passenger list (P)
3. (1hr.)	Familiarity with parallel rule, dividers and compass(T)	Course to steer to allow for current and leeway(P)	Full knowledge of navigation lights, buoys and restrictions in area of operation (T)/General application of regulations applicable to the prevention of pollution(T)	Giving instructions in crowd management situations(P) /Evacuation of passengers(T)	Report preparation(T)/Report preparation(P)
4.(1hr.)	Familiarity with parallel rule, dividers and compass (P)	Course to steer to allow for current and leeway(P)	Full knowledge of navigation lights, buoys and restrictions in areas of operation (P)	Evacuation of passengers(P)/ Vessel insurance(T)	General ideas on ship construction and on plans available on board and where they are kept(T)
5. (1hr.)	Position fixing (T)	Passage planning (T)	Full knowledge of navigation lights, buoys and restrictions in areas of operation (P)	Preparation of Deck Log(T)/Preparation of Deck Log(P)	General ideas on ship construction and on plans available on board and where they are kept(P)/Outline knowledge of freeboard and trim(T)
6.(1hr.)	Position fixing(P)	Passage planning (P)	Preparation and operation of muster list(T)/Preparation and operation of muster list(P)	Procedures for leaving and entering port(T)/Procedures for leaving and entering port(P)	General pumping arrangements(T) General pumping arrangements(P)

**BOAT MASTER GRADE 1**

**PART C- COURSE TIME TABLE**

**Week 2 [ (T) = Theory and (P) = Practical**

<b>Period</b>	<b>Day 1</b>	<b>Day 2</b>	<b>Day 3</b>	<b>Day 4</b>	<b>Day 5</b>
1 (1hr.)	General principles of work boat stability (T)	Overtight mooring(T)/Overtight mooring(P)			
2 (1hr.)	General principles of work boat stability (P)	Maintaining water tight sub-division (T)/Cranes, their operations and safe operating limits			
3 (1hr.)	Heeling forces and their causes(T)/ Equilibrium on the heeled condition(T)	Cranes, their operations and safe operating limits(P)			
4 (1hr.)	Effect of liquid on free surface and its control(T)/Effects of liquid on free surface and its control(P)	The use of stability and hydrostatic tables(T)/The use of stability and hydrostatic tables(P)			
5 (1hr.)	Application and effects of asymmetric loading (T)/ Application and effects of asymmetric loading(P)	Review and Assessment			
6 (1hr.)	Simple dynamic balance (T)/Simple dynamic balance (P)	Review and Assessment			

**BOATMASTER GRADE 1**

**PART D – DETAILED TEACHING SYLLABUS**

The teaching syllabus is prepared in learning objective format in which the objective describes what the trainee must do to demonstrate that knowledge has been transferred.

All objectives are understood to be prefixed by the words *“The expected learning outcome is that the trainee .....*”

**Boatmaster Grade 1**

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
<b>1</b>	<b>Chart Work (12 hours)</b>	Day Skipper Pages 40- 41	
<b>1.1</b>	<b>Deviation, Variation and Deviation Tables</b> <ol style="list-style-type: none"> <li>1. demonstrates               <ul style="list-style-type: none"> <li>- the ability to calculate deviation and variation and use deviation tables to apply deviation</li> </ul> </li> </ol>	An Introduction to Coastal Navigation – A Seaman’s Guide Section 2  Yachts Master page 9  Exercise in Coastal Navigation	
<b>1.2</b>	<b>Familiarity with the use of parallel rule, dividers and compass</b> <ol style="list-style-type: none"> <li>1. understands and demonstrates knowledge of:               <ul style="list-style-type: none"> <li>- the use of the slide rule</li> <li>- walking the slide rule</li> <li>- using the slide rule to mark off latitude and longitude</li> <li>- using the dividers to mark off distances</li> </ul> </li> </ol>	Yachtmaster Page 4  A Seaman’s Guide to Basic Chartwork Chapter 7	
<b>1.3</b>	<b>Position Fixing</b> <ol style="list-style-type: none"> <li>1. understands               <ul style="list-style-type: none"> <li>- what is fixing the position of a vessel and its importance</li> </ul> </li> <li>2. demonstrates knowledge of:               <ul style="list-style-type: none"> <li>- course</li> <li>- bearing</li> <li>- visual bearing</li> </ul> </li> </ol>	A Seaman’s Guide to Basic Chartwork Chapters 2 and 3  Introduction to Coastal Navigation – A Seaman’s Guide Section 9	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>- dead reckoning</li> <li>- cross bearing</li> <li>- two and three point bearings</li> <li>- true and relative bearings</li> <li>- position line</li> <li>- running fix</li> <li>- transits</li> <li>- range</li> <li>- estimated position</li> <li>- laying off of course</li> <li>- course steered</li> <li>- distance covered</li> <li>- tracks</li> <li>- dipping distance</li> <li>- position fixing using GPS and radar</li> <li>- radar bearing</li> <li>- way point</li> </ul>	<p>Maritime Chartwork Chapters 1-6</p> <p>Day Skipper Pages 52-53</p> <p>Yacht Master Pages 22 –33</p>	
<b>1.4</b>	<p><b>Course to steer to allow for current and leeway</b></p> <ol style="list-style-type: none"> <li>1. understands <ul style="list-style-type: none"> <li>- the meaning of leeway</li> <li>- the effect of tide, wind current and leeway on vessel course</li> <li>- ground track/course over ground</li> <li>- water track</li> <li>- set and drift</li> <li>- correction of course to compensate for tide, current, wind, drift and leeway</li> </ul> </li> </ol>	<p>A Seaman’s Guide to Basic Chartwork Chapter 3</p> <p>Day Skipper Page 50 -51</p> <p>An Introduction to Coastal Navigation Section 10</p>	
<b>1.5</b>	<p><b>Passage Planning</b></p> <ol style="list-style-type: none"> <li>1. understands <ul style="list-style-type: none"> <li>- the need to obtain information on weather forecast and sea conditions for the passage</li> <li>- estimated time of departure (ETD)</li> </ul> </li> <li>2. able to calculate estimated time of arrival(ETA) given the weather and sea conditions</li> </ol>	<p>A Seaman’s Guide to Basic Chartwork Chapter 6</p>	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<p>3. demonstrate the ability to plan and provide necessary supplies in terms of fuel, oil, water, food etc taking into consideration passengers and crew on the voyage.</p>		
<b>2.</b>	<p><b>Publications (2 hours)</b></p> <p>1. knowledge of acquisition of the following publications and their significance in maritime operations:</p> <ul style="list-style-type: none"> <li>- merchant shipping notice</li> <li>- admiralty charts</li> <li>- tide tables</li> <li>- regulations associated with the particular port or area of operation</li> </ul>		
<b>3.</b>	<p><b>Buoyage System (2.5 hours)</b></p> <p><b>3.1 Full knowledge of navigation lights, buoys and restrictions in the area of operation</b></p> <p>1. understands in some detail the IALA Bouyage System</p> <p>2. demonstrates knowledge of</p> <ul style="list-style-type: none"> <li>- the buoyage system</li> <li>- navigation light characteristics, markers and restrictions in the area of operation</li> </ul>	<p>Yacht Master Pages 56 –57</p> <p>Introduction to Coastal Navigation A Seaman’s Guide Section 6</p>	
<b>4.</b>	<p><b>Ship’s Business (5.5 hours)</b></p> <p><b>4.1 Preparation of Deck Log</b></p> <p>1. demonstrates the ability to prepare a deck log to include :</p> <ul style="list-style-type: none"> <li>- details relating to marine casualties, death and other incidences</li> <li>- details of voyage to include course, weather and drills</li> </ul>	<p>Nicholls’s Seamanship and Nautical Knowledge pages 390-391</p>	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<ul style="list-style-type: none"> <li>- details of disciplinary measures and actions taken against seamen</li> <li>- other matters relevant to the operation of the vessel</li> </ul>		
<b>4.2</b>	<p><b>Procedures for entering and leaving a port</b></p> <ol style="list-style-type: none"> <li>1. understands, explains and demonstrates the ability to prepare documents relating to: <ul style="list-style-type: none"> <li>- Customs and Immigration</li> <li>- Port Health</li> <li>- Passengers, crew and cargo</li> </ul> </li> </ol>		
<b>4.3</b>	<p><b>Crew List</b></p> <ol style="list-style-type: none"> <li>1. demonstrates the ability to prepare a crew list in relation to: <ul style="list-style-type: none"> <li>- qualification</li> <li>- personal details</li> </ul> </li> </ol>		
<b>4.4</b>	<p><b>Passenger list</b></p> <ol style="list-style-type: none"> <li>1. demonstrates the ability to prepare a complete passenger list and the agencies with which it should be lodged</li> </ol>		
<b>4.5</b>	<p><b>Vessel Insurance</b></p> <ol style="list-style-type: none"> <li>1. understands <ul style="list-style-type: none"> <li>- marine insurance coverage for vessel and equipment, crew, passengers and cargo</li> <li>- knowledge of reputable insurance agencies</li> <li>- preparation of reports for insurance claims</li> </ul> </li> </ol>		
<b>4.6</b>	<p><b>Report Preparation</b></p> <ol style="list-style-type: none"> <li>1. demonstrates: <ul style="list-style-type: none"> <li>- the ability to prepare complete report on voyage and all activities and occurrences associated with the operation of the vessel</li> </ul> </li> </ol>		

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
<b>5.</b>	<b>Crowd Management (4.5 hours)</b>	IMO Model Course 1:28	
<b>5.1</b>	<b>Preparation and Operation of a Muster List</b> <ol style="list-style-type: none"> <li>1. knows and understands: <ul style="list-style-type: none"> <li>- muster in case of emergencies</li> <li>- what is a muster list</li> <li>- preparation of a muster list in terms of the assignment of personnel, their duties and location of muster stations</li> <li>- information on muster stations in terms of display of notices, announcements and other communications</li> <li>- manning and operation of muster stations</li> </ul> </li> </ol>		
<b>5.2</b>	<b>Knowledge and operation of emergency exits</b> <ol style="list-style-type: none"> <li>1. demonstrates <ul style="list-style-type: none"> <li>- complete knowledge of all emergency exits</li> <li>- their function and operation</li> </ul> </li> </ol>		
<b>5.3</b>	<b>Giving instructions in a crowd management situation</b> <ol style="list-style-type: none"> <li>1. understands <ul style="list-style-type: none"> <li>- the necessity to establish and maintain effective: <ul style="list-style-type: none"> <li>▪ clear and concise instructions;</li> <li>▪ the transmission of information from other personnel;</li> <li>▪ communication through systems other than voice such as hand signals to indicate location of instructions and muster stations, life saving devices and evacuation routes</li> </ul> </li> </ul> </li> </ol>		

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
<b>5.4</b>	<p><b>Evacuation of Passengers</b></p> <p>1. understands:</p> <ul style="list-style-type: none"> <li>- the importance of making announcements and providing information of emergency procedures and life saving devices to passengers before start of the voyage</li> <li>- that emergency situations may not be immediately accepted by some passengers</li> <li>- that there may be panic or abnormal behaviour of passengers under an emergency situations</li> <li>- that some passengers may seek to locate relatives, friends and luggage</li> <li>- passengers may seek safety of cabins and other places</li> <li>- the need to locate all passengers and get them to the muster station</li> <li>- the need to have muster stations and evacuation routes adequately manned</li> </ul>		
<b>5.5</b>	<p><b>Communication in a crowd management situation</b></p> <p>1. knows</p> <ul style="list-style-type: none"> <li>- the appropriate oral communication language</li> <li>- the use of communication systems such as intercom, radio, signals, signs etc.</li> </ul>		
<b>6.</b>	<p><b>Basic Knowledge of Vessel Construction and Stability (12.5 hours)</b></p>	<p>Nicholls’s Seamanship and Nautical Knowledge Chapter 14</p> <p>Principles and Practices of Ship</p>	
<b>6.1</b>	<p><b>General ideas of ship construction and on plans available on board vessel and where they are kept</b></p> <p>1. understands and knows</p> <ul style="list-style-type: none"> <li>- materials used vessel</li> </ul>		

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<p>construction i.e. wood, steel, glass reinforced plastic/fibre glass</p> <ul style="list-style-type: none"> <li>- the general principal structural members of a vessel and the proper names of the various parts</li> <li>- plans which should be available on board such as : <ul style="list-style-type: none"> <li>▪ overall plan of the structural lay out of the vessel, plans for engine room layout, deck layout, electrical systems, plumbing system , water tight integrity system</li> </ul> </li> </ul> <p>2. knows</p> <ul style="list-style-type: none"> <li>- the locations on the vessel where plans are stored and access to these plans</li> </ul>	<p>Stability pages 140-144</p>	
<b>6.2</b>	<p><b>General principles of work boat stability</b></p> <p>1. explains and define:</p> <ul style="list-style-type: none"> <li>- intact stability</li> <li>- buoyancy</li> <li>- centre of gravity</li> <li>- righting moment</li> <li>- maintenance of centre of gravity</li> <li>- actions to be taken in partial loss of buoyancy</li> </ul>	<p>Principles and Practices of Ship Stability Chapter 9</p> <p>An Introduction to Fishing Vessel Stability pages 1-19</p>	
<b>6.3</b>	<p><b>Outline knowledge of freeboard and trim</b></p> <p>1. understands and explains:</p> <ul style="list-style-type: none"> <li>- definition of freeboard</li> <li>- loading marks in relation to freeboard</li> <li>- the effects of not maintaining required freeboard</li> <li>- the relationship between freeboard and stability</li> <li>- measures required to maintain</li> </ul>	<p>Nicholl's Seamanship and Nautical Knowledge pages 392</p>	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<p>freeboard</p> <ul style="list-style-type: none"> <li>- definition of trim</li> <li>- aft and forward draught in relation to trim</li> <li>- relation between trim and stability</li> <li>- measurers to maintain trim</li> </ul>		
<b>6.4</b>	<p><b>Maintaining water tight sub-division</b></p> <p>1. understands and knows:</p> <ul style="list-style-type: none"> <li>- what is watertight integrity of a vessel</li> <li>- what is a watertight sub-division and how they function</li> <li>- definition of bulkhead</li> <li>- the number and type of water tight sub-divisions in relation to the type of vessel</li> <li>- water tight doors and their general upkeep and maintenance</li> </ul>	Nicholl's Seamanship and Nautical Knowledge pages 297	
<b>6.5</b>	<p><b>General pumping arrangements</b></p> <p>1. understands and knows:</p> <ul style="list-style-type: none"> <li>- pumping arrangements in terms of : <ul style="list-style-type: none"> <li>▪ types of pumps</li> <li>▪ drives</li> <li>▪ sea cocks</li> <li>▪ suction</li> <li>▪ discharges</li> <li>▪ piping systems</li> </ul> </li> <li>- main, auxiliary and emergency pumps</li> <li>- the bilge piping and pumping systems to include portable, hand, mechanical and submersible electrical bilge pumps</li> <li>- that sluice valves shall not be fitted in water tight bulkheads</li> </ul>	Diesel Engines- Question and Answers Chapter 5	
<b>6.6</b>	<p><b>Heeling forces and their causes</b></p> <p>1. understands and explains:</p> <ul style="list-style-type: none"> <li>- the definition of heeling in</li> </ul>	Principles and Practices of Ship Stability	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
	<p>relation to vessel stability</p> <ul style="list-style-type: none"> <li>- the causes of heeling in relation to: <ul style="list-style-type: none"> <li>▪ loading</li> <li>▪ centre of gravity</li> <li>▪ free surface effect</li> <li>▪ metacentric height</li> <li>▪ shifting of cargo and load</li> <li>▪ effect of wind and sea</li> <li>▪ conditions</li> <li>▪ turning</li> </ul> </li> </ul>	Section 9	
<b>6.7</b>	<p><b>Equilibrium on the heeled condition</b></p> <ol style="list-style-type: none"> <li>1. understands and explains how to overcome the heeled condition and return vessel to the vertical in terms of: <ul style="list-style-type: none"> <li>- redistribution of weight</li> <li>- eliminating free surface effects</li> <li>- utilizing the loading list</li> <li>- taking care in manoeuvring the vessel in heavy sea conditions</li> </ul> </li> </ol>	Principles and Practices of Ship Stability Section 3	
<b>6.8</b>	<p><b>Application and effects of asymmetric loading</b></p> <ol style="list-style-type: none"> <li>1. understands and explains: <ul style="list-style-type: none"> <li>- the loading list</li> <li>- the need to adhere to the loading list</li> <li>- symmetrical loading</li> <li>- asymmetric loading</li> <li>- the effects of asymmetric loading on vessel stability</li> <li>- measures to overcome asymmetric loading</li> </ul> </li> </ol>	Principles and Practices of Ship Stability Section 10	
<b>6.9</b>	<p><b>Overtight mooring</b></p> <ol style="list-style-type: none"> <li>1. understanding <ul style="list-style-type: none"> <li>- the need to use the recommended scope in mooring of the vessel</li> <li>- the effects of overtight mooring on stability of the vessel in heavy sea conditions</li> </ul> </li> </ol>		

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
<b>6.10</b>	<p><b>Simple dynamic balance</b></p> <p>1. understands:</p> <ul style="list-style-type: none"> <li>- that simple dynamic balance deals with external forces which may incline the vessel and affect stability</li> <li>- that static balance deals with internal forces which may affect stability</li> </ul>	<p>Principles and Practices of Ship Stability Section 3</p>	
<b>6.11</b>	<p><b>Effects of liquid on free surface and its control</b></p> <p>1. understands</p> <ul style="list-style-type: none"> <li>- the definition of free surface</li> <li>- that free surface may be caused primarily by uncontrolled movement of water and other equipment</li> <li>- the influence of fuel levels in fuel tank, water on deck, ballast water in ballast tank on free surface effect</li> <li>- factors in the reduction of free surface effect</li> </ul>	<p>Principles and Practices of Ship Stability Section 7</p>	
<b>6.12</b>	<p><b>Cranes, their operation and safe operating limits</b></p> <p>1. understands and explains:</p> <ul style="list-style-type: none"> <li>- that cranes and derrick are equipment for the loading of cargo and heavy equipment on board the vessel</li> <li>- the lifting capacity of the cranes and derricks and safe lifting loads</li> <li>- that the vessel must have adequate stability before lifting heavy loads on cranes or derrick</li> <li>- the effect on the centre of gravity and stability as a result of the lifting of heavy loads</li> </ul>	<p>Nicholl's Seamanship and Nautical Knowledge pages 41-56 pages 404-406</p> <p>Code of Safe Working Practices for Merchant Seamen pages 95-97</p>	

	<b>Learning Objectives</b>	<b>Reference /Teaching Aid</b>	
<b>6.13</b>	<p><b>The use of stability and hydrostatic tables</b></p> <p>1. understands and explains:</p> <ul style="list-style-type: none"> <li>- that a stability table shows the relative leverages exerted by the vessel to restore it to the equilibrium when forcibly inclined by wind or the sea</li> <li>- stability curves</li> <li>- interpretation of stability tables and curves in relation to centre of gravity (G), centre of gravity above keel ( KG) metacentric height (GM), tipping centre (TC), height of centre of buoyancy (KB), the distance between centre of gravity and centre of buoyancy(GZ)</li> <li>- the hydrostatic curve</li> <li>- that the hydrostatic curve can be used to find displacement at any draught</li> <li>- tonnes per centimetre immersion(TPC)</li> </ul>	Principles and Practices of Ship Stability Section 10	
<b>7.</b>	<p><b>Prevention of Pollution (0.5 hour)</b></p> <p><b>7.1 A general appreciation of regulations applicable to prevention of pollution</b></p> <p>1. knows regulations relating to</p> <ul style="list-style-type: none"> <li>- the disposal of garbage at sea in relation to: <ul style="list-style-type: none"> <li>▪ the type of garbage which can be disposed of outside of special maritime areas and within special maritime areas.</li> </ul> </li> </ul>	Oil Pollution from Ships Chapters 1,2 and 4	
<b>8</b>	<b>Review and Assessment 2 Hours</b>		

## BOATMASTER GRADE 1

### REFERENCES FOR MODEL TRAINING COURSE

1. DAY SKIPPER- INTRODUCTION TO NAVIGATION THEORY, SAFETY AND SEAMANSHIP, 2002. Prepared by Penny Haire, illustrated by Sarah Selman. Royal Yacht Association, RYA House, Ensign Way, Hamble, Southampton SO31 4YA, United Kingdom  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
2. YACHTMASTER- ADVANCED NAVIGATION THEORY, SAFETY AND SEAMANSHIP, 2002. Prepared by Penny Haire, illustrated by Sarah Selman. Royal Yacht Association, Romsey Road, Eastleigh, Hampshire SO50 9YA, United Kingdom.  
E-mail: [training@rya.org.uk](mailto:training@rya.org.uk)  
Website: [www.rya.org.uk](http://www.rya.org.uk)
3. NICHOLLS'S SEAMANSHIP AND NAUTICAL KNOWLEDGE, 1979. Revised by A.N. Cockcroft, F.R.I M, Extra Master. Brown, Son and Ferguson Ltd, Nautical Publications, 52 Darnley Street, G41 2SG, Glasgow
4. EXERCISES IN COASTAL NAVIGATION, 1986. G.W. W Stanford Maritime Ltd., Member, Company of George Philip Group. 12 Long Acre, London, WC2E 9LP, Stanford Maritime, London.
5. AN INTRODUCTION TO COASTAL NAVIGATION – A SEAMAN'S GUIDE, 1992. Morgan Technical Books Ltd, P.O. Box 5, The Stables, Darnley, Wotton Under Edge, Gloucestershire, United Kingdom
6. MARITIME CHARTWORK, 1975, (2<sup>nd</sup> Edition). D.A. Moore, Stanford Maritime Ltd. Member Company of George Philip Group. 12 Long Acre, London, WC2E 9LP, Stanford Maritime, London.
7. SEAMAN'S GUIDE TO BASIC CHART WORK, 1985. Morgan's Technical Books Ltd, P.O. Box 5, Wotton Under Edge, Gloucestershire, United Kingdom.
8. AN INTRODUCTION TO FISHING VESSEL STABILITY. Canadian Coast Guard
7. IMO MODEL COURSE 1:28: Crowd Management and Safety Training for Personnel Providing Direct Service for Passengers in Passenger Space
9. CODE OF SAFE WORKING PRACTICES FOR MERCHANT SEAMEN, 1991. The Maritime Directorate, the Department of Transport. London.
10. PRINCIPLES AND PRACTICES OF SHIP STABILITY, 1984. Capt. L.G. Taylor. Brown, Son and Ferguson Ltd., 4-10 Darnley Street. Glasgow.
11. DIESEL ENGINES- QUESTION AND ANSWERS. A.J. Wharton, C. Eng., F.I. Mar E, Stanford Maritime Limited Member Company of George Philip Group. 12 Long Acre, Stanford Marine, London.
12. OIL POLLUTION FROM SHIPS, 1985. International, United Kingdom and the United States Law and Practice (2<sup>nd</sup> Edition). David W. Abecassis M.A., Ph. D and Richard J. Jarashow J.D., L.L. M

## **BOATMASTER GRADE 1**

### **PART E – INSTRUCTOR’S MANUAL**

#### **Introduction**

The instructor manual provides guidance on the material that is to be presented during the course. The course material reflects the requirements for the training of Boatmaster Grade 1 in accordance with **Annex 11** of the SCV Code.

The material has been arranged under eleven main headings:

1. Chart Work
2. Publications
3. Buoyage Systems
4. Ship’s Business
5. Crowd Management
6. Basic Knowledge of Vessel Construction and Stability
7. Prevention of Pollution
8. Review and Assessment

The course outline and time table which include both theoretical and practical sessions provide guidance and time allocations for the course materials. However, the instructor is free to make adjustments as necessary to facilitate circumstances which may be peculiar to the situation and environment. The detailed teaching syllabus must be studied carefully and lesson plans or lecture notes compiled where appropriate in accordance with Part D – Detailed Teaching Syllabus at page 78.

In addition, the class size in terms of ratio of instructor to trainee is limited to 1:15 for theoretical sessions and 1:10 for practical sessions to facilitate ease of instructions.

In relation to practical and other specialized aspects of the training, the instructor is advised to fully acquaint and inform trainees in good time of particular requirements.

## **Bibliography**

The attention of the instructor is drawn to bibliographical references to ten of the main subject areas as noted in Part D – Detailed Teaching Syllabus, pages 78 – 88 and the complete list of references at page 89.

## GUIDANCE NOTES

### 1. Chart Work

12 Hours

#### 1.1 Deviation, Variation and Deviation Tables

The trainee should undergo extended practice and exercises in the calculation of compass corrections for deviation and variation utilizing deviation tables. The instructor should ensure that the trainee is fully competent in these areas by continuously testing the trainee.

#### 1.2 Familiarity with the Use of Parallel Rule, Dividers and Compass

The uses and functions of the parallel rule, dividers and compass in chart work and the plotting of courses are to be fully explained to the trainee. Extensive exercises and practice in their proper use should be undertaken by the trainee under the direction of the instructor who should also ensure that a satisfactory level of competence is attained by the trainee.

#### 1.3 Position Fixing

The importance of accurate position fixing to safe navigation and vessel operations must be fully explained to the trainee. At the same time the dangers and risks which may result from inaccurate and improper fixes must also be explained. Along with these explanations, all the elements and factors which are utilized in this exercise should be fully defined and explained. Extensive practical exercises in position fixing utilizing all the possible conditions and circumstances must be undertaken by the trainee until the instructor is satisfied on the competency of the trainee.

#### 7.4 Course to Steer to allow for Current and Leeway

The need to steer the correct course in safe navigation must be explained to the trainee, in addition to how steering a proper course may be affected by current, leeway and associated sea conditions. These sea conditions such as tide, wind, drift and waves and their effects should be clearly defined and explained and the corrective methods and procedures which must be applied to ensure that the correct course is steered and maintained throughout the passage.

#### 7.5 Passage Planning

The need for the proper planning of a passage or voyage must be explained by the instructor with emphasis on the effects of weather and sea conditions on safe navigation,

safety of passengers and the keeping of arrival time. The necessity that the vessel must be properly equipped, fuelled and victualled for the passage taking into consideration the needs of all crew and passengers and the duration of the passage must be made known to the trainee. The need for catering for possible emergencies must also be taught.

The trainees must undertake exercises and practice in passage planning until the instructor is satisfied that to an acceptable level of competency is attained.

## **2. Publications 2 Hours**

The instructor should ensure that the trainee is not only familiar with all the relevant nautical publications associated with vessel operations and safe navigation especially in the area of operation, but he must also be directed as to where they may be located. Samples of all these publications should be made available to the trainee who should also be taught how they should be used and applied.

## **3. Buoyage Systems 2.5 Hours**

### **3.1 Full Knowledge of Navigation Lights, Buoys and Restrictions in the Area of Operation**

The buoyage, navigation lights and traffic separation systems in the area of operation of the vessel must be taught to the trainee using models, charts, simulators and other teaching aids. Practical exercise in the actual environment must also be conducted to allow the trainee to become familiar and knowledgeable of the systems. The IALA Buoyage System must also be taught and made familiar to the trainee.

## **4. Ship's Business 5.5 Hours**

### **4.1 Preparation of Deck Log**

The necessity for a deck log which is kept in accordance with regulations and requirements must be explained to the trainee. A properly prepared deck log should be made available to the trainee as a teaching aid and the proper preparation procedures and the required information should be taught. The trainee should also be allowed to practice preparing deck logs to the satisfaction of the instructor.

### **4.2 Procedures for Entering and Leaving Port**

The relevant statutory and government agencies which must be involved when a vessel leaves or enters a port should be explained to the trainee. The necessary documentation

required by each must be explained to the trainee who should also be taught the methods and procedures in their preparation and lodging.

### **4.3 Crew List**

The trainee should understand the need for a crew list and also the correct method of the preparation of such a list with the proper and required information. A sample crew list should be made available to the trainee by the instructor who should ensure that he is capable of preparing a crew list through under taking practical exercises.

### **4.4 Passenger List**

The trainee should understand the need for a passenger list and also the correct method of the preparation of such a list with the proper and required information. A sample passenger list should be made available to the trainee by the instructor who should ensure that he is capable of preparing a passenger list through under taking practical exercises.

### **4.5 Vessel Insurance**

The need and legality for marine insurance on hull, machinery, cargo, crew and passengers should be explained by the instructor. The timely renewal of marine insurance and the names of reputable marine insurance companies should also be taught to the trainee. The trainee should be made to examine a current marine insurance policy and the instructor should explain the salient elements in the document.

### **4.6 Report Preparation**

The preparation of relevant reports should be stressed to the trainee as being very important in the operation and management of a vessel. The trainee should be taught and guided in the proper procedures in report preparation and also directed in the type of information that is considered relevant to a particular report. The instructor should ensure that the trainee receives extended practice in report preparation and in this regard interaction among the trainees should be encouraged.

## **5. Crowd Management**

**4.5 Hours**

### **5.1 Preparation of a Muster List**

A specimen muster list should be used by the instructor to illustrate this activity. Trainees should also practice the drawing up of a muster list and also utilizing the communication and commands associated with this exercise. Mustering should be practiced utilizing the trainees.

## **5.2 Knowledge and Operation of Emergency Exits**

The trainee should be able to demonstrate knowledge and familiarity of all emergency exits on the vessel and be able to satisfy the instructor that he is capable of operating and managing them.

## **5.3 Giving Instructions in Crowd Management Situation**

The trainee should be able to identify a situation which requires crowd management and be knowledgeable and familiar and with the appropriate instructions to be given in such situation. The instructor should ensure that trainees practice the routines.

## **5.4 Evacuation of Passengers**

Situations which may warrant the evacuation of passengers should be identifiable by the trainee who must also be made familiar with making the appropriate announcement, communicating with crew and passengers under emergency situations and manning muster stations.

## **5.5 Communication in a Crowd Management Situation**

It should be ensured that in this situation the trainee has knowledge and is capable of utilizing all the communication media which are available on board the vessel through practice and demonstrations.

## **6. Basic Knowledge of Vessel Construction and Stability 12.5 Hours**

### **6.1 General Ideas of Ship Construction and on Plans Available on Board Vessel and where they are Kept**

The trainee should be taught and acquire knowledge of the different types of materials which are used in the construction of a vessel in addition to their advantages and disadvantages in the performance and stability of the vessel. The need for having the various construction plans to be kept at particular location on board the vessel and their easy accessibility should also be explained to the trainee.

### **6.2 General Principles of Work Boat Stability**

The various elements and factors which may influence the stability of a working vessel and the associated dangers should be defined and fully explained to the trainee. The associated methods and procedures to correct and maintain stability should also be explained and demonstrated to the trainee utilizing modals, simulators and other appropriate teaching aids.

### **6.3 Outline Knowledge of Freeboard and Trim**

The concepts of freeboard and trim should be defined and their effects on the safe operation of a vessel especially in relation to stability, fully explained to the trainee. The use of models, simulators and other appropriate teaching should be used to illustrate the concepts.

### **6.4 Maintenance of Water Tight Sub-Divisions**

The importance of water tight sub-divisions, doors and bulkheads in the construction of a vessel and their functions in the event of an accident should be taught and explained to the trainee in addition to the dangers which may be caused if these water tight facilities are breached. The continuous maintenance of the facilities and the methods and procedures for achieving this must be explained to the trainee.

### **6.5 General Pumping Arrangements**

The arrangement of all pumps and associated mechanisms, their features, functions and operations should be explained to the trainee. The need to operate these devices in accordance with design specifications and the hazards which may arise for not so doing should also be explained to the trainee.

### **6.6 Heeling Forces and their Causes**

The definition of heeling and all those various factors which may cause a vessel to heel including the possible dangers and hazards should be explained to the trainee. The instructor should illustrate these effects with the use of models, simulators and other appropriate teaching aids.

### **6.7 Equilibrium on the Heeled Condition**

The dangers and hazards which may result if the heeled condition is not prevented through the use of proper procedures or not overcome in a timely manner should be explained to the trainee. The factors and procedures to maintain equilibrium and to return to the heeled condition should also be defined and explained to the trainee. A sample loading list and weight distribution during the loading process should be demonstrated to the trainee.

### **6.8 Application and Effects of Asymmetric Loading**

The dangers and hazards which are likely to occur and adversely affect the safe operation of the vessel, crew and passengers must be explained in relation to asymmetric loading.

The proper use of the loading list and demonstration of its use and application should be explained and stressed to the trainee.

### **6.9 Overtight Mooring**

The concept of overtight mooring must be explained to the trainee including the dangers which may result from this action. Procedures to avoid this action should also be explained.

### **6.10 Simple Dynamic Balance**

The terminology of simple dynamic balance should be defined by the instructor who should further explain its effect on vessel stability. Some comparison should be made by also defining and explaining static balance. Demonstrations using models, simulations and other teaching aids should be used to further illustrate this occurrence.

### **6.11 Effects of Liquid on Free-surface and its Effects**

Free-surface effect should be defined and explained to the trainee in addition to the factors which may lead to this phenomenon and methods and procedures to reduce or minimize its effects. Demonstrations using models, simulations and other teaching aids should be used to further illustrate this occurrence.

### **6.12 Cranes their Operation and Safe Operating Limits**

The types of cranes and derricks which are used on the vessel in addition to their strategic locations and lifting capacity should be explained to the trainee. The effects on the stability of the vessel in the misuse of these equipment and machinery or lifting heavy loads should also be explained by the instructor.

### **6.13 The Use of Stability and Hydrostatic Tables**

Stability and hydrostatic tables and curves of the vessel to be operated should be made available to the trainees who should be taught how to use, interpret and undertake calculations in relation to all the elements and factors which may affect stability.

## **7. Prevention of Pollution 0.5 Hour**

### **7.1 A General Appreciation of Regulations Applicable to Prevention of Pollution**

Documentation containing the regulations regarding the prevention of pollution in the area of operation should be made available to the trainee. These regulations should be

discussed with the trainees to allow them to understand their application and the consequences for non compliance.

**8. Review and Assessment**

**2 Hours**

The instructor should briefly review the course content, stressing those areas of importance in each subject area especially those which promote operational safety. Informal discussion among trainees and instructor is encouraged where appropriate. A final evaluation of the trainees' learning objectives should be conducted by a combination of practical demonstrations to establish an agreed level of competence and written tests.

## EXAMPLE OF A LESSON PLAN

**COURSE:**            **Boatmaster Grade 1**            **Lesson Number**            **Duration:**    **120 Minutes**  
**TRAINING AREA:**    **Regulations for Preventing Collision at Sea**

MAIN ELEMENT Specific learning objective (in teaching sequence with memory keys)	Teaching Method	Text Book Reference	A/V Aids	Instructor Guidelines	Time (Mins)
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### 1. Chart Work

- |   |                      |   |  |                       |    |
|---|----------------------|---|--|-----------------------|----|
| 1. Passage Planning <ul style="list-style-type: none"> <li>- intended passage</li> <li>- indication of intended sea passage</li> <li>- intended time and place of departure</li> <li>- intended time and place of arrival</li> </ul>  | Classroom<br>lecture | A Seaman's Guide to<br>Basic Chartwork<br>Chapter 6 |  | Instructor's<br>Notes | 5  |
| 2. Identification of sea conditions<br>between point of departure and<br>point of arrival <ul style="list-style-type: none"> <li>- estimated distance</li> <li>- currents</li> <li>- tides</li> <li>- winds</li> <li>- vessel traffic</li> <li>- navigation rules or regulations</li> </ul> | Classroom<br>lecture |   |  | Instructor's<br>Notes | 25 |

<p>3. Weather conditions</p> <ul style="list-style-type: none"> <li>- wind speed and direction</li> <li>- visibility</li> <li>- barometric pressure</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>20</p>
<p>4. Vessel specifications</p> <ul style="list-style-type: none"> <li>- operating speed</li> <li>- fuel capacity</li> <li>- oil requirements</li> <li>- water capacity</li> <li>- passenger capacity</li> <li>- cargo capacity</li> <li>- food capacity</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>15</p>
<p>5. Voyage information</p> <ul style="list-style-type: none"> <li>- number of passengers</li> <li>- cargo payload</li> <li>- water requirements</li> <li>- food requirements</li> <li>- fuel and oil requirements</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>15</p>
<p>6. Calculation of expected time of arrival (ETA) given</p> <ul style="list-style-type: none"> <li>- intended passage</li> <li>- sea conditions</li> <li>- weather conditions</li> <li>- vessel specifications</li> <li>- voyage information</li> </ul>	<p>Classroom lecture</p>	<p>Instructor's Notes</p>	<p>40</p>

## PART F- EVALUATION

### Introduction

The effectiveness of any evaluation depends upon the accuracy of the description of what is to be measured.

The learning objectives used in the detailed syllabus will provide a sound basis for the construction of suitable tests for evaluating the trainee progress.

### Method of Evaluation

The methods chosen to carry out an evaluation will depend on what the trainee is expected to achieve in terms of knowing, comprehending and applying the course content.

The methods used can range from simple question and answer discussion with the trainee (either individually or as group), or prepared tests requiring the selection of correct or best responses from given alternatives, the correct matching of given items, the supply of short answer or the supply of more extensive written responses to prepared questions.

Where the course content is aimed at the acquisition of practical skills, the test would involve a practical demonstration by the trainee making use of appropriate equipment, tools, etc.

The responses demanded may therefore consist of:

- *the recall of facts, information by viva-voce or objective tests*
- *the practical demonstration of an attained skill*
- *the oral or written description of procedures or activities*
- *the identification and use of data from sketches, drawings, maps, charts, etc*
- *carrying out of calculations to solve numerical problems*
- *the writing of an essay report.*

## **Validity**

The evaluation must be based on clearly defined objectives, and it must truly represent what is to be measured. There must be a reasonable balance between the subject topic involved and also in the testing of trainee's knowledge, comprehension and application of concepts.

The time allocation for the trainee to provide a response is very important. Each question or task must be properly tested and validated before it is used to ensure that the test will provide a fair and valid evaluation.

## **Reliability**

To be reliable, an evaluation procedure should produce reasonably consistent results no matter which set of papers or version of the test involved is used.

## **Subject Testing**

Traditional methods of evaluation require the trainee to demonstrate what has been learned by stating or writing formal answers to questions.

Such evaluation is subjective in that it invariably depends upon the judgment of the evaluator. Different evaluators can produce quite different scores when marking the same paper or evaluating oral answers.

## **Objective Testing**

A variety of objective tests have been developed over the years. Their common feature is that the evaluation does not require a judgment by the evaluator. The response is either right or wrong.

One type of objective test involves supplying an answer, generally a single word, to complete the missing portion of a sentence. Another involves supplying a short answer of two or three words to a question. Such tests are known as 'completion tests, and 'short answer tests'.

Another form of objective testing consists of 'selective response tests' in which the correct, or best response must be selected from given alternatives. Such tests may consist of 'matching tests,' in which items contained in two separate lists must be matched, or they may be of the true/false type or of the multiple choice type.

The most flexible form of objective test is the multiple choice test, which presents the trainee with a problem and a list of alternative solutions, from which he must select the most appropriate.

## **Distracters**

The incorrect alternatives in multiple-choice questions are called ‘distracters’, because their purpose is to distract the uninformed trainee from the correct response. The distracter must be realistic and should be based on misconceptions commonly held, or on mistakes commonly made.

The options “none of the above” or “all of the above” are used in some tests. These can be helpful, but should be used sparingly.

Distracters should distract the uninformed, but they should not take the form of “trick” questions that could mislead the knowledgeable trainee (for example, do not insert a correct response to make it a distracter).

## **Guess Factor**

The ‘guess factor’ with four alternative responses in a multiple-choice test would be 25%. The pass mark chosen for all selective-response questions should be taken into account.

## **Scoring**

In simple scoring of objective tests one mark may be allotted to each correct response, zero for a nil-response and minus one for an incorrect response. Where a multiple-choice involves four alternatives, this means that a totally uninformed guess involves a 25% chance of gaining one mark and a 75% chance of losing one mark.

Scores can be weighted to reflect the relative importance of questions, or of sections of an evaluation.