



**Sjøfartsdirektoratet**  
Norwegian Maritime Authority

# Curriculum D5L

**Curriculum for training of masters and  
mates on recreational craft with a  
hull length of up to 24 metres**

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# 1 Introduction

## 1.1 How to use the curriculum

The curriculum is a document used by all accredited schools and course providers in Norway offering courses for recreational craft operators (D5L). The objective of the curriculum is to ensure that the course content satisfies the training requirements stipulated for this type of vessel, and that all courses provide the same training to the students. The curriculum includes a list of the subjects to be taught as well as the equipment and teacher competence required for this training. The curriculum will form the basis for the individual educational institution's teaching plan and set requirements for the implementation of evaluation and examination.

## 1.2 Course description

The curriculum comprises the following subjects:

- navigation
- navigational aids
- rules of the road at sea and navigational watch requirements
- ship studies
- safety and security
- technology and marine motor engineering
- navigational aids in practice
- handling the craft

The subjects may be studied at various course providers as long as the course provider has a subject-based system where each subject has its own final exam. The students must complete the training and exam for each subject at the same course provider. However, if the original course provider does not offer some of the practical subjects, e.g. 2.7 and 2.8, these subjects may be studied at another course provider.

### 1.2.1 Competence

The course comprises theoretical and practical training for a certificate that entitles the holder to operate a recreational craft with a hull length of up to 24 meters in trade area Great coasting. Required seagoing service (vessel experience), medical certificate and age is set out in the Regulations of 22 December 2011 No. 1523 on qualifications and certificates for seafarers (the Qualification Regulations).

The Norwegian Maritime Authority (NMA) sets the requirements that apply in order to approve alternative practice. The NMA sets the requirements for supplementary training, the D5LA course, which entitles the holder to operate a recreational craft with a hull length of up to 24 meters in trade area Great Coasting.

## 1.3 Objectives

The course objective is to provide the required theoretical and practical training in order to operate a recreational craft in trade area Great Coasting, as well as other vessel types defined by the NMA.

## 1.4 Teaching methods

The course, which may be subject based, can be led by a teacher-based on a predetermined number of lessons per subject (see appendix 1).

Online course, together with teacher-led summary course, is permitted. [More info about online course is found here \(Norwegian only\)](#).

The students must attend a teacher-led course including practical exercises covering the following subjects:

- navigational aids in practice
- handling the craft.

Necessary instruments and accessories must be available for the teacher-led course.

## 1.5 Evaluations and exams

The students may sit each exam following completion of each course.

The exam will be a written test comprising the following subjects:

- navigation
- navigational aids
- rules of the road at sea and navigational watch requirements
- ship studies
- safety and security
- technology and marine motor engineering.

The exam will be prepared by the subject teacher and approved by an external examiner.

There will be no final exam for the subjects Navigational aids in practice and Handling the craft. However, the students must have been actively involved and demonstrated an understanding for the subject, as described in annex 4 and 5.

Evaluations and exams will be based on the same guidelines that apply to upper secondary schools with regard to attendance, grading, censorship and supervision.

Grading shall be given based on section 3–5 of the Regulations to the Education Act, where grade 1 equals fail and grade 6 is the highest possible grade. The students must have a score of at least 40 % in order to be issued with a certificate, this equals minimum grade 3. For the navigation part, the students are also required to be able to plan a safe voyage. Setting a course over a shoal may for example result in a failed exam, regardless of having answered the rest of the questions correctly.

An evaluation is made after each exam, and the grade will be entered into the student's report card when completing the respective exam. When all the exams and practical subjects are completed, a final diploma is issued including all grades from the final exams. The diploma content must be in accordance with the formal requirements stated in the attached template (annex 6).

## 1.6 Absence

Absence can be accepted in subject 2.1 to 2.6. Absence is not permitted in the two practical subjects (2.7 and 2.8).

Up to 10 % absence is permitted in each of the theoretical subjects (2.1 to 2.6). This is in accordance with section 3-9 of the Regulations to the Education Act.

## 1.7 Instructor and examiner competence

The requirements for instructor and examiner/assessor follow section 14, paragraph 5, in Regulations of 22 December 2011 No. 1523 on qualifications and certificates for seafarers:

*Instructors shall have an appreciation of the training programme and an understanding of the specific training objectives for the particular type of training being conducted; In addition, instructors shall be certified at least on the same level as the functions for which the training is conducted, or possess qualifications at a higher educational level. Assessors shall be qualified for the function for which the assessment apply to and must have received training in assessment methods and practice.*

Instructors who will be teaching the courses “navigation” and “rules of the road at sea and navigational watch requirements”, must as a minimum have been a holder of a Deck Officer Class 4 (D4) Certificate or be able to document equivalent skills. Education equivalent to a Deck Officer Class 4 from the Norwegian Naval Academy and the Navy may be approved even though a certificate has not been issued. Instructors must have completed the IMO 6.09 Training Course for Instructors or equivalent training.

Examiner/assessor shall be qualified for the courses the assessment apply for. Examiners who will be assessing the courses “navigation” and “rules of the road at sea and navigational watch requirements”, must as a minimum have been a holder of a Deck Officer Class 4 (D4) Certificate or be able to document equivalent skills. In addition, examiners must have completed the IMO 6.09 Training Course for Instructors or equivalent training. In contrast to instructors, assessor training course will be approved even though the course do not contain IMO 6.09.

Instructors teaching the two practical courses (2.7 and 2.8), and assessors for the practical examination (utsjekk), shall be a holder of a Deck Officer Class 5 Pleasure Craft certificate (D5L) or hold a higher valid STCW-certificate.

## 1.8 Equipment

Schools and course providers must have the necessary equipment in order to carry out training in accordance with the curriculum. Course providers teaching Navigational aids in practice (2.7) and Handling the craft (2.8) must have access to an adequate vessel.

See annex 2 for mandatory and recommended equipment for the teaching and annex 3 for equipment related to the practical exercises related to subject 2.7 and 2.8.

## 1.9 Quality assurance

A quality assurance system must be implemented for schools and course providers. The quality assurance system must describe and document the following as a minimum:

- policies and objectives related to quality
- teacher qualifications
- equipment and learning material
- continuous evaluation
- exams and continuous evaluation
- system for corrective measures
- non-conformity management.

The system must be updated at any time. The course provider must be available for audit by the Norwegian Maritime Authority at short notice.

### 1.10 Approval

All schools and course providers who wish to teach in accordance with this curriculum must be approved by the Norwegian Maritime Authority to teach the course before teaching commences. The application for approval must comprise documentation for the points in 1.8 Quality assurance.

Maritime schools offering studies in nautical science will be approved by the NMA if the teaching is quality assured in accordance with subjects in the curriculum and is part of the school programme. The schools must inform the NMA if the curriculum is being used.

### 1.11 Changelog

#### Version 1.1:

- The sentence regarding the difference between Norwegian and IHO reference levels is removed from 2.1.3 b).

#### Version 1.2 – 02.2021:

- Appendix 6 (diploma) have been updated.
- Chapter 1.4 is updated.
- Chapter 1.5 is updated.
- Chapter 1.6 on absence is added.
- Chapter 1.7 have been updated. Requirements for instructor and examiner, found in Regulation 1523 and note “krav til kvalitetssystem”, have been specified.

#### Version 1.3 – 03.2022:

- Standard and secondary ports is replaced by “specific place” in 2.1.3 c, as the Norwegian Mapping Authority do not use these definitions anymore.

#### Version 1.4 – 11.2022:

- Requirements added for instructors and assessors that are responsible for practical training, see chapter 1.7.

## 2 Course content

The course comprises eight subjects that will give the students the knowledge they need to operate this type of vessel in the specified trade area. The subjects are divided into topics with associated learning targets. The learning targets will be an essential part of the teaching.

### 2.1 Navigation

The students will be taught in the following subjects and learning targets:

#### 2.1.1 Use of nautical charts and nautical publications

The students must have satisfactory knowledge of and know the basic principles on safe navigation by using nautical charts, chart plotter / chart machine and commonly used navigational aids during the voyage – day, night and under restricted visibility, in sheltered waters and coastal waters. The students must make use of information from the nautical charts and be able to identify all potential risks.

- 2.1.1 a) The students should be able to describe how the Earth is divided into coordinates and how the geographic latitude and longitude of a location is measured and indicated.
- 2.1.1 b) The students should have knowledge of cardinal directions, about distance measurement at sea.
- 2.1.1 c) be able to explain about the properties of the Mercator chart and the connection between the latitude scale and a nautical mile and about the scale of the chart.
- 2.1.1 d) The students should be using a catalogue of charts, be able to find necessary charts (main charts, special charts and harbour charts) for a voyage along the coast.
- 2.1.1 e) The students should be familiar with the requirement for update of nautical charts and how chart corrections are published and carried out.
- 2.1.1 f) The students should have thorough knowledge of the details of the nautical charts, be able to interpret symbols, abbreviations, depth markings and marking of navigational obstructions and tracks.
- 2.1.1 g) The students should be able to describe and use rules of navigation when using lighthouses, lights and fixed and floating navigation marks, including knowledge of the IALA system.
- 2.1.1 h) The students should be able to find courses to navigate by, distances to sail and be able to plan a safe voyage in accordance with rules of navigation and the size and draught of the vessel.
- 2.1.1 i) The students should be able to use *Den norske los (Norwegian Pilot Guide)* and familiarise themselves with sailing directions and voyage guides for a planned voyage.
- 2.1.1 j) The students should be able to demonstrate dead reckoning on the chart and



find dead reckoning position based on course and distance travelled, with and without current and drift.

- 2.1.1 k) The students should be able to explain the difference between true and magnetic courses, and to find the magnetic variation of a location and correct it to the current year.
- 2.1.1 l) The students should be able to find the deviation for the current course by means of curve/table and control the compass using reliable bearings.
- 2.1.1 m) The students should be able to correct courses and bearings for deviation and variation, both from chart to compass and from compass to chart.

### **2.1.2 Position fixing**

The students should be able to fix positions and control the voyage using bearings and by help from other commonly used navigational aids.

- 2.1.2 a) The students should be able to determine position using cross bearings and leading marks.
- 2.1.2 b) The students should be able to describe and use the terms abeam and passed and use doubling angles on the bow for approximate position and estimated passing distance.
- 2.1.2 c) The students should be able to determine position and control navigation using radar, chart plotter, echo-sounder and GPS.

### **2.1.3 Tide, current and drift**

The students should be able to estimate the high and low tide times in Norwegian waters and be able to make required assessments of the current and drift effect on the voyage.

- 2.1.3 a) The students should be familiar with the causes of tide on Earth and how local conditions affect the tide.
- 2.1.3 b) The students should be able to explain the different reference levels used on nautical charts in order to indicate depths and height of bridges and overhead cables.
- 2.1.3 c) The students should be able to use tide tables for the Norwegian coast and find times for high and low tide, find the height of the tide at a certain time and the time for a certain height at a specific place.
- 2.1.3 d) The students should be able to determine sets of current using current tables in charts and using nautical publications.
- 2.1.3 e) The students should be able to understand the effects of the current on vessel and navigation.
- 2.1.3 f) The students should understand drift as a function of the wind's direction and

force and the vessel's course and windage.

- 2.1.3 g) The students should understand true course travelled and steered and demonstrate the use in navigation.

#### **2.1.4 Documentation of voyage**

The students should be familiar with the requirements to documentation of the voyage, laid down in the regulations, and the need for accurate documentation following particular incidents or accidents.

- 2.1.4 a) The students should be familiar with regulations for keeping deck logbook on small ships.

- 2.1.4 b) The students should be familiar with the fact that courses and positions plotted in voyage charts and printouts from navigational aids can be very important means of documenting the voyage.

## 2.2 Navigational aids

The students will be taught in the following subjects and learning targets:

### 2.2.1 Use of compass

The students should have satisfactory knowledge of the basic principles of magnetic compasses and electronic compasses and be able to correct courses and bearings for compass errors. The students should be able to demonstrate the use of compass for voyage and position fixing.

- 2.2.1 a) The students should be familiar with the cause of the magnetic compass deviation, with factors that may affect/change the deviation and with rules for handling the compass.
- 2.2.1 b) The students should be familiar with principles for other direction-indicating instruments, such as GPS compass, fluxgate compass, gyrocompass and similar, and the necessary corrections of these instruments.
- 2.2.1 c) The students should be familiar with the principles for autopilot and the settings that need to be made for correct function. In this connection, it is particularly important to be familiar with the autopilots' use of course to steer, alternatively course made good (COG) and to know the autopilot's interaction with other electronic navigational aids.

### 2.2.2 Position fixing and navigational control

The students should have satisfactory knowledge of and know the basic principles on commonly used navigational aids for position fixing and navigational control. They should be familiar with the system's fault conditions. The equipment must be operated in a proper manner, and self-assessment and ability of critical thinking must be employed with regard to instrument data.

- 2.2.2 a) The students should be familiar with the principle and manner of operation of commonly used logs and use logs in dead reckoning.
- 2.2.2 b) The students should be familiar with the principle and manner of operation of commonly used echo-sounders, have knowledge of error sources that may affect the sounder's depth reading and use echo-sounders for keel clearance.
- 2.2.2 c) The students should be familiar with the principles of and be able to use the information from radar and ARPA, the error sources and limitations that need to be taken into account in various weather and sea conditions, including which types of echo to be expected and received from land of various properties, other vessels of different size and material (or with radar reflector).
- 2.2.2 d) The students should be able to operate and set a radar for optimal function, including that the student must understand the English terms gain, tune, clutter as well as variable choices such as true motion and relative motion, and have knowledge of the use of the overlay function.
- 2.2.2 e) The students should be able to use a radar for position fixing using bearings and distance and for navigational control.
- 2.2.2 f) The students should be able to demonstrate use of radar for monitoring the area around the vessel and for traffic control, as well as be able to demonstrate correct use against chart plotter, AIS and RACON, and to demonstrate an understanding for relative movements during plotting or using an ARPA.
- 2.2.2 g) The students should be able to use GPS receiver for position fixing and navigational control, to set receiver correctly and be familiar with position accuracy and the limitations of the system, and have knowledge of the most important terms and abbreviations as well as an understanding of chart datum.
- 2.2.2 h) The students should be able to use electronic nautical charts and know the possibilities and limitations of the charts, including the most important settings such as level of detail, connection against other instrument, possibilities for alarm settings and orientation of bow direction and planning of voyage, and have knowledge of hazards between chart datum and settings of GPS and the correct scale in the chart plotter (navigation mode) when sailing.
- 2.2.2 i) The students should be familiar with the AIS and know which boats are required to have such a system, know the difference between type "A" and "B" and "passive", i.e. only receiver, and be aware of benefits, hazards and limitations.

## 2.3 Rules of the road at sea and navigational watch requirements

The students will be taught in the following subjects and learning targets:

### 2.3.1 Rules of the road at sea

The students should have thorough knowledge and understanding of the applicable rules for preventing collisions at sea.

2.3.1 a) The students should have thorough knowledge and understanding of the following parts of the rules:

- part A rules 2 and 3, the entire part B and the entire part C of Chapter I, international regulations;
- the entire part B and part C, especially rules 43 and 44 of chapter II, special rules for Norwegian inland waters;
- annex IV on distress signals;

and be able to demonstrate the correct manoeuvre to avoid collision or close-quarters situations with vessels in sight (using models or simulator).

2.3.1 b) The students should have knowledge of the rules of navigation in traffic separation schemes and have sound knowledge of the other rules.

2.3.1 c) The students should be able to identify lights, shapes and sound signals required by the rules and to describe their meaning, including additional signals for fishing vessels.

2.3.1 d) The students should be able to explain provisions on speed restrictions for Norwegian waters and where such exist.

2.3.1 e) The students should be able to identify vessels on collision course or that will come close to own vessel and be able to give reasons for and demonstrate correct yielding manoeuvres.

### 2.3.2 Navigational watch function

The students should be able to understand watchkeeping arrangements that do not compromise safety and be familiar with rules and regulations to be complied with.

2.3.2 a) The students should be able to describe routines for function testing and checking equipment and aids on the bridge / conning position.

2.3.2 b) The students should be able to explain basic principles on navigational watch on board.

2.3.2 c) The students should learn safe and understandable communication at the conning position and be able to use this.

2.3.2 d) The students should be able to explain transmission and receipt of navigational warnings.

2.3.2 e) The students should have thorough knowledge of distress signals as referred to in Annex IV to the Rules of the Road at Sea.

## 2.4 Ship theory

The students will be taught in the following subjects and learning targets:

### 2.4.1 Supervision of vessels

The students should have sound knowledge of the acts, regulations and rules that are applicable for recreational craft with an aim to prevent accidents and to operate a safe vessel.

- 2.4.1 a) The students should be familiar with which vessels that are required to be registered.
- 2.4.1 b) The students should be familiar with the tasks of the International Maritime Organization and have knowledge of the international Conventions SOLAS, MARPOL and relevant national pollution control regulations.
- 2.4.1 c) The students should have knowledge of the Regulations of 15 January 2016 No. 35 on the manufacturing and the placing on the market of recreational craft, etc. (Recreational Craft Regulations) and be able to use relevant publications from the NMA to find regulations and rules applicable to a given vessel or a given situation with regard to certificates, navigational aids, life-saving appliances, fire protection and other required equipment.
- 2.4.1 d) The students should be able to explain relevant parts of the Act of 16 February 2007 No. 9 relating to ship safety and security (Ship Safety and Security Act).
- 2.4.1 e) The students should be familiar with prescribed blood-alcohol limit at sea, including compulsory abstinence.

### 2.4.2 Vessel management

The students should have knowledge of the responsibility of being master on board, how the vessel should be treated the best way under changing conditions and be able to secure the vessel and persons on board against adverse events.

- 2.4.2 a) The students should be able to define the vessel's main dimensions, draught, and be able to describe how size is indicated.
- 2.4.2 b) The students should be familiar with the most common vessel types, be familiar with characteristics that may influence the manoeuvrability of a vessel, such as planing craft vs displacement craft, sailing vessel and motorboat, wood and steel vs plastic (mass/speed).
- 2.4.2 c) The students should be able to explain how the vessel is made ready for a voyage (ship shape) and the significance of ensuring and checking that openings are securely closed.
- 2.4.2 d) The students should be able to give an account of the loads to which a vessel and superstructure are exposed when the vessel is forced ahead in

rough seas and how to reduce such loads.

- 2.4.2 e) The students should be able to give an account of how to handle a vessel in rough weather, including preparing the vessel, drifting in heavy seas and how to heave to in order to reduce the load.
- 2.4.2 f) The students should be able to describe how the rudder and propellers function when manoeuvring and be familiar with smaller vessel's steering, turning and stopping capabilities and factors affecting the ability to manoeuvre.
- 2.4.2 g) The students should have sound knowledge of safe mooring, knots, anchoring, towing, wake, in addition to good practical seamanship.

### 2.4.3 Stability

The students should have a thorough knowledge of stability conditions on smaller vessels, of circumstances that may reduce stability and which actions to take to operate a vessel safely.

- 2.4.3 a) The students should be able to define and understand the sizes KG, KB, KM, GM and the righting lever (GZ) – the candidate should be able to describe how to obtain them, to explain how weight distribution on board and the vessel's shape and freeboard affect these sizes and be able to define the terms positive, negative and unstable stability.
- 2.4.3 b) The students should be able to explain how the vessel's ability to withstand heeling is dependent on GM and how the vessel's ability to re-right itself after heeling is dependent on the GZ lever (the righting lever).
- 2.4.3 c) The students should be familiar with KG as a function of, i.a., the weight distribution on board and how KG changes when weights shift on board or weights are taken on or off the vessel.
- 2.4.3 d) The students should be able to describe the effect on stability and precautions to be taken as a result of:
- slack tanks and filling/emptying of bottom tanks;
  - shipped water and flooding on deck;
  - icing of rigging and superstructure;
  - stability reduction in sea state;
  - excess weight on fly bridge / poop deck.
- 2.4.3 e) The students should be able to describe safe placement, stowage, securing and control of extra weights.

### 2.4.4 Meteorology, weather, wind and waves

The students should have basic knowledge of meteorology, weather, wind and waves.

- 2.4.4 a) The students should have knowledge and understanding of high and low pressure and fronts, how wind forms and which affect this has on the sea state, and the candidate should also have knowledge of the Beaufort scale, make their own observations and check the local conditions.
- 2.4.4 b) The students should have a basic understanding of and be able to interpret weather forecasts, synoptic weather charts and knowledge of the various weather forecast sources.
- 2.4.4 c) The students should have basic knowledge of waves, including significant wave height, breaking waves and to be familiar with "dangerous sea areas" and the necessary caution to exercise in rough weather.



## 2.5 Safety

The students will be taught in the following subjects and learning targets:

### 2.5.1 First aid

The students should be able to provide first aid and medical care to sick and injured persons on board.

- 2.5.1 a) The students should have basic knowledge of the body's functions, symptoms of disease and treatment of sick and injured persons.
- 2.5.1 b) The students should be able to administer lifesaving first aid, CPR, particularly with regard to drowning and hypothermia, be able to administer first aid in the event of bleeding, poisoning, fractures, burns and prevention of infection.
- 2.5.1 c) The students should be familiar with the use of the lifesaving and first aid equipment required to be carried on board the vessel and in lifeboats/liferafts.
- 2.5.1 d) The students should have knowledge of the possibility to get assistance from a medical advisor "Medico".

### 2.5.2 Fire protection

Throughout the course the students will review the main elements of fire prevention and fire extinction.

- 2.5.2 a) The students should be able to give account of the most important elements of fire theory, such as the conditions necessary for a fire to arise.
- 2.5.2 b) The students should be able to give account of how to warn of fire, inter alia by using the communication equipment, but also by other warning methods.
- 2.5.2 c) The students should be able to explain the most important principles for extinguishing fire using different types of fire-extinguishing medium.
- 2.5.2 d) The students should be able to explain which types of fire-extinguishing material are suitable on-board smaller vessels, and which fire-extinguishing means are required for the vessel in question pursuant to the Recreational Craft Regulations.
- 2.5.2 e) The students should be able to give account of the risk of poisoning and internal burns as a result of fire and smoke gases.
- 2.5.2 f) The students should be able to give account of measures to be taken to prevent a fire to arise (fire protection), including knowledge of fire and gas detectors.
- 2.5.2 g) The students should be able to give account of hazards, precautions and measures related to the use of gas on board.

### **2.5.3 Rescue service, SAR, notification and distress communication**

Throughout the course, the students will review how the rescue service is organised. This includes the Joint Rescue Coordination Centre, SAR, GMDSS, coastal radio stations and satellite-based systems for notification and distress communication.

- 2.5.3 a) The students should be able to describe the set-up of the rescue service for coastal and sea areas, with helicopter, rescue vessels and other parties.
- 2.5.3 b) The students should be able to describe SAR communication with GMDSS, with particular focus on the use of VHF as distress communication system.
- 2.5.3 c) The students should know the function, including the correct use and maintenance, of satellite-based systems for notification and distress communication, including SART, EPIRB with GPS and AIS – and the integration of these systems with radars and plotters.

### **2.5.4 Emergency situations**

The students should have basic knowledge of leader responsibilities and methods of operation during emergencies and the importance of maintaining a sound training standard on board, as well as the duty to help persons and vessels in need at sea.

The students should be able to give an account of measures of prevention, protection and actions, such as:

- 2.5.4 a) man-over-board situation (MOB);
- 2.5.4 b) search for missing persons;
- 2.5.4 c) search for vessels in distress / survival craft;
- 2.5.4 d) rescue of persons from sea and from craft;
- 2.5.4 e) assistance from rescue vessel or helicopter;
- 2.5.4 f) damage limitation following collision, grounding and rudder damage;
- 2.5.4 g) abandoning ship;
- 2.5.4 h) use and maintenance of personal life-saving appliances;
- 2.5.4 i) use of and requirements for service of inflatable liferafts;
- 2.5.4 j) knowledge of the different types of pyrotechnical equipment, how to store and use such equipment, and the expiry date thereof.

## 2.6 Technology/machinery

The students will be taught in the following subjects and learning targets:

### 2.6.1 Propulsion machinery

The students should have basic knowledge of engines, propulsion systems and technical installations. They must be able to carry out basic controls and maintenance.

- 2.6.1 a) The students should be able to give an account of the different types of engines that are used for propulsion machinery, e.g.:
  - the two-stroke and four-stroke engine;
  - engine types used in recreational craft.
- 2.6.1 b) The students should be able to discuss main parts, such as foundation, gear and transmission, propeller arrangement, propeller sheath.
- 2.6.1 c) The students should have knowledge of rudder, steering and manoeuvring systems.
- 2.6.1 d) The students should have knowledge of the engines' main systems, such as air, fuel, cooling, exhaust, oil and lubrication.
- 2.6.1 e) The students should be able to give account of various measures for handling and maintenance of engine systems and be able to explain necessary measures to avoid overheating, breakdown and unintended water ingress, e.g. through bottom valves or in the event of fractures of cooling water tubes/hoses.
- 2.6.1 f) The students should know about immediate measures in the event of engine failure at sea, including replacing fuel filter and inspection/repair of elementary and critical factors.
- 2.6.1 g) The students should give an account of different types of fuel to be used, including properties such as flashpoint and effects on people and environment.
- 2.6.1 h) The students should have knowledge of corrosion as a result of unfavourable material combinations, galvanic corrosion and environmental effects, and be familiar with methods for reducing the problems.

### **2.6.2 Electrical installations**

The students should have basic knowledge of electrical installations, including regular maintenance as well as hazards related to errors.

- 2.6.2 a) The students should have knowledge of main components and structure of electrical installations on board, including battery and capacity, charging, shore power, generator as well as common voltages such as 12VDC, 24VDC and 240VAC.
- 2.6.2 b) The students should be familiar with conditions affecting charging and consumption.
- 2.6.2 c) The students should be very familiar with the relationship between voltage and cable size, both to ensure proper function and to reduce the risk of fire, have knowledge of fuses and amperage.
- 2.6.2 d) The students should be able to carry out continuing supervision and simple maintenance.

### **2.6.3 Technical installations**

The students should be able to account for different technical installations.

- 2.6.3 a) The students should be familiar with relevant systems for heating and pantry installations, including electric, gas, diesel, paraffin, etc.
- 2.6.3 b) The students should be familiar with safety measures when using the various installations, including risk of explosion/fire and risk of suffocation/poisoning.

## **2.7 Navigational aids in practice**

The students will be taught in the following subjects and learning targets:

### **2.7.1 Use of navigational aids when sailing**

The teacher will teach the students basic skills in practical use of navigational aids. See the implementation matrix in annex 4.

- 2.7.1 a) The students should have a basic proficiency in using GPS.
- 2.7.1 b) The students should have a basic proficiency in using electronic charts.
- 2.7.1 c) The students should have a basic proficiency in using radar.
- 2.7.1 d) The students should have a basic proficiency in using other instruments, such as electronic compasses, autopilot, AIS, echo-sounder, logs, as well as their integration against remaining instruments, by NMEA, etc.

## **2.8 Handling the craft**

The students will be taught in the following subjects and learning targets:

### **2.8.1 Preparation, manoeuvring and safe navigation**

The students will be taught basic skills in practical vessel management and navigation. See the implementation matrix in annex 5.

- 2.8.1 a) The students should have a basic proficiency in preparing and checking vessel.
- 2.8.1 b) The students should have a basic proficiency in vessel handling when anchoring.
- 2.8.1 c) The students should have a basic proficiency in manoeuvring and a good understanding of the interaction between the rudder and propeller.
- 2.8.1 d) The students should have a basic proficiency in navigating the vessel day/night.

### 3 Annexes

#### 3.1 Annex 1: Overview of subjects and lessons

D5L – Certificate for Deck Officer in trade area Great coasting

Subjects – D5L	Objectiv	Subjects	Lessons*		Exam
			Suggested number	Min. number of lessons	
<b>2.1 Navigation</b>	2.1.1	Use of nautical charts and nautical publication	20	36	4
	2.1.2	Position fixing	6		
	2.1.3	Tide, current and drift	6		
	2.1.4	Documentation of voyage	4		
<b>2.2 Navigational aids</b>	2.2.1	Use of compass	4	10	2
	2.2.2	Position fixing and navigational control	6		
<b>2.3 Rules of the road at sea and navigational watch</b>	2.3.1	Rules of the road at sea	10	14	2
	2.3.2	Navigational watch function	4		
<b>2.4 Ship theory</b>	2.4.1	Supervision of vessels	4	15	2
	2.4.2	Vessel management	4		
	2.4.3	Stability	4		
	2.4.4	Meteorology, weather, wind and waves	3		
<b>2.5 Safety</b>	2.5.1	First aid	7	20	3
	2.5.2	Fire protection	6		
	2.5.3	Rescue and notification	3		
	2.5.4	Emergency situations	4		
<b>2.6 Technology/machinery</b>	2.6.1	Propulsion machinery	6	8	2
	2.6.2	Electrical installations	1		
	2.6.3	Technical installations	1		
<b>2.7 Navigational aids (practical lessons)</b>	2.7.1 a)	GPS	2	8	Attended
	2.7.1 b)	Chart plotter/ Electronic chart	2		
	2.7.1 c)	Radar	3		
	2.7.1 d)	Other instruments	1		
<b>2.8 Handling the craft (practical lessons)</b>	2.8.1 a)	Preparation/Control	1	9	Attended
	2.8.1 b)	Vessel management	1		
	2.8.1 c)	Manoeuvring	2		
	2.8.1 d)	Navigation day/night	5		
* One lesson lasts 45 minutes					
** The exam hours are not included in the total number of lessons					<b>120 lessons**</b>

### 3.2 Annex 2: Materials to be used for subjects 2.1 to 2.6

Subjects	Description		Remarks
	Mandatory	Recommended	
2.1, 2.2	Magnetic compass		
2.1, 2.2	GPS receiver / electronic charts		
2.1, 2.2	Relevant charts		
2.1, 2.2	Publications such as DNL (the Norwegian Pilot Guide)		
2.1, 2.2	Relevant acts and regulations		
2.1, 2.2	Deck log		
2.3.	Navigation light simulator		Alternatively, on PC/monitor
2.5	Life jacket		
2.5	EPIRB, SART		As «dummy»
2.5	Pyrotechnical equipment		As «dummy»
2.1, 2.2		Pelorus	
2.5		First-aid equipment	
2.5		Manikin or equivalent for CPR practice	
2.6		Filters, filter housing	
2.6		V-belts, couplings, zinc anodes	
2.6		Cables, junctions, etc.	

### 3.3 Annex 3: Additional equipment for subjects 2.7 and 2.8

A "suitable vessel" is needed for subject 2.7 Navigational aids in practice and 2.8 Handling the craft. The vessel's hull length must be between 13 and 24 meters, and the vessel must have the necessary safety equipment in order to maintain the safety on board for all.

In cases of doubt, the Norwegian Maritime Authority will determine whether a vessel is suitable.

The vessel must be equipped with the following:		
Subjects	Description	Remarks
2.7	Radar	Preferably with «overlay»
2.7	GPS receiver	
2.7	Chart machine / plotter	
2.7	Compass	
2.7	Autopilot	
2.7	AIS	
2.7, 2.8	Radar transponder (SART)	
2.5, 2.8	Equipment for communication	Fixed/handheld VHF is mandatory
2.7, 2.8	Distress communication, EPIRB, float-free	
2.8	Liferaft	
2.8	Fire protection equipment	
2.8	Mooring equipment, fenders, anchor, etc.	
2.8	Man overboard marker	



### 3.4 Annex 4: Navigational aids in practice

	COMPETENCE	KNOWLEDGE, UNDERSTANDING AND	PRACTICAL TEACHING ADJUSTED TO VESSEL AND CONDITIONS
7.1a	Basic proficiency in using GPS	<p>Have knowledge of the principles for the GPS system and practical use of GPS receivers</p> <p>Be familiar with potential weaknesses and error sources of the GPS system</p> <p>Have knowledge of the most current chart datum used in navigation at sea, e.g. WGS 84, ED 50, NGO 48, and be able to set the GPS receiver in the right mode</p> <p>Have knowledge of the most current communication protocols, e.g. NMEA in different versions</p> <p>Be able to set the GPS receiver and other associated instruments in order to transfer navigational data correctly</p>	<p>Give an account of how the GPS system is constructed, number of satellites, orbital path and rotation</p> <p>Give an account of the most common causes for getting wrong information or misinterpreting information from the system:</p> <ul style="list-style-type: none"> <li>- shadowing from mountains, buildings, etc.;</li> <li>- electronic noise from transmitters nearby;</li> <li>- atmospheric conditions;</li> <li>- incorrect receiver settings;</li> <li>- incorrect equipment operation.</li> </ul> <p>Demonstrate how to set a maritime GPS receiver in order to make sure that chart datum matches the chart cards in the plotters, and demonstrate the correct settings compared to paper charts</p> <p>Demonstrate how to set GPS receivers to the correct NMEA version and baud rate</p> <p>Give an account of commonly used sentences as SOG, COG, HDG, RMC, etc. and show the correct settings on the transmitter and receiver to provide for an accurate communication between GPS, plotter, radar, autopilot, etc.</p>

7.1b	<p>Basic proficiency in using electronic charts</p>	<p>Have knowledge of the principles of electronic charts and practical use of electronic chart displays / plotters on board recreational craft</p> <p>Be familiar with weaknesses and error sources that may influence chart displays / plotters</p> <p>Be able to set the plotter to make it as secure and practical as possible for the voyage</p> <p>Be able to set waypoints and routes in a safe and appropriate way</p> <p>Be aware of and use the overlay function for radars and plotters of different types and under shifting operating conditions</p>	<p>Give an account of electronic chart displays / plotters and describe how they use the GPS system and other sources of data input</p> <p>Give an account of the most common causes for getting wrong information or misinterpreting information from the system:</p> <ul style="list-style-type: none"> <li>- errors as a result of shadowing from mountains, buildings, etc.;</li> <li>- electronic noise from instruments nearby;</li> <li>- slow transfer of data, processing and displaying;</li> <li>- atmospheric conditions;</li> <li>- problems as a result of poorly synchronised chart sheets;</li> <li>- misunderstandings due to trusting the resulting data too much;</li> <li>- be familiar with non-conformities regarding COG and HDG, etc. and be aware of the causes;</li> <li>- incorrect receiver settings;</li> <li>- incorrect equipment operation.</li> </ul> <p>Give a practical demonstration of the optimal setting of instruments, with particular focus on:</p> <ul style="list-style-type: none"> <li>- the correct scale for the purpose;</li> <li>- choosing level of details;</li> <li>- adjust the chart information to avoid a cluttered screen and confusing details;</li> <li>- choosing chart information for day/night voyages;</li> <li>- setting the screen with regard to colours and brightness.</li> </ul> <p>Demonstrate the use of waypoints and route functions on the plotters on board during a voyage, e.g.:</p> <ul style="list-style-type: none"> <li>- marking of single waypoints;</li> <li>- connecting waypoints and creating routes;</li> <li>- checking possible risks along the way;</li> <li>- reversing routes;</li> <li>- using alarm functions;</li> <li>- integrated AIS with CPA/TCPA.</li> </ul> <p>Understand the risks of trusting the chart machine or plotter's reliability and credibility completely</p> <p>Demonstrate a safe and good use of overlay during a voyage, with particular focus on:</p> <ul style="list-style-type: none"> <li>- correct orientation: north up, course up;</li> <li>- proper scale;</li> <li>- recognising details from a chart vs radar;</li> <li>- using bearings and distance measuring.</li> </ul>
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7.1c	Basic proficiency in using radar	<p>Have knowledge of the principles that apply for radars used on board recreational craft</p> <p>Be familiar with the most common radar types that are used on board recreational types as well as their specific functions</p> <p>Be able to set the radar to make it as secure and useful as possible under all circumstances</p> <p>Be familiar with weaknesses and error sources that may influence radar reliability</p> <p>Be aware of and use the overlay function for radars and plotters of different types and under various operating conditions</p>	<p>Give an account of different radar types and describe how they work, individually and as an integrated part of a more comprehensive navigation system</p> <p>Give an account of advantages and disadvantages when using:</p> <ul style="list-style-type: none"> <li>- conventional pulse radar</li> <li>- digital radar</li> <li>- broadband radar.</li> </ul> <p>Give an account of available functions for the radar types, such as:</p> <ul style="list-style-type: none"> <li>- tuning</li> <li>- luminous intensity</li> <li>- distance setting</li> <li>- rain filter, sea filter</li> <li>- EBL/VRM</li> <li>- «off centre»</li> <li>- ARPA.</li> </ul> <p>During a voyage, demonstrate the ability to master the radar functions in the most optimal way and be familiar with its limitations during various operating conditions, such as:</p> <ul style="list-style-type: none"> <li>- bearing and range finder to determine distance to shore, vessels and other objects;</li> <li>- setting a new course when altering the course;</li> <li>- collision risk assessment;</li> <li>- discovering foreign objects in the area;</li> <li>- determining an appropriate passage in narrow waters;</li> <li>- using integrated AIS with CPA/TCPA;</li> <li>- dead zones and false echoes;</li> <li>- impact from rain and sea water;</li> <li>- receiving SART signals-</li> </ul> <p>Demonstrate a safe and good use of overlay during a voyage, with particular focus on:</p> <ul style="list-style-type: none"> <li>- correct orientation (north up, course up, etc.);</li> <li>- proper scale;</li> <li>- recognising radar details vs plotter images;</li> <li>- using bearings and distance measuring.</li> </ul>
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7.1d	<p>Basic proficiency in using:</p> <p>electronic compass</p> <p>autopilot</p> <p>AIS</p> <p>echo-sounding equipment</p> <p>log</p>	<p>Have knowledge of the principles and practical use of the following navigational aids that are used on board fishing vessels:</p> <p>Be familiar with functions and use of i.a.:</p> <ul style="list-style-type: none"> <li>- fluxgate compasses</li> <li>- rate gyro</li> <li>- GPS compass (with multiple GPS solutions)</li> <li>- gyro compass.</li> </ul> <p>Be familiar with the autopilot function and a secure and practical use of it.</p> <p>Be familiar with the AIS system and have practical knowledge about its use and be well-acquainted with the main types of AIS that are used at sea (A, B, passive)</p> <p>Be familiar with risks related to giving different attention to explicit AIS signals and less explicit "non-AIS vessels"</p> <p>Be familiar with the echo sounder function and practical use for navigational purposes</p> <p>Be familiar with the different log types that are used to determine the distance travelled</p>	<p>Demonstrate familiarity with the instruments used during a voyage through proper use and settings</p> <p>Be able to describe the effect of the appropriate compass types and give reasons for which error sources that are applicable, e.g. variations, deviations, gyro errors, mechanical influences, speed and latitude errors, etc.</p> <p>Be able to account for the differences between COG and HDG</p> <p>Be able to describe how the autopilot works and state applicable inputs and choices that must be made</p> <p>Demonstrate a good understanding of settings and options that exist when setting and using instruments during a voyage</p> <p>Be familiar with situations / error sources that may affect the autopilot and be able to describe under which circumstances it should not be in use</p> <p>Be able to account for the AIS system's operation, range and communication, and demonstrate a correct setting of fixed and variable data, including integration of other navigational aids</p> <p>Demonstrate a good understanding of the resulting data, e.g. identification, CPA, TCPA, when setting and using instruments during a voyage, and be extremely observant with regard to the fact that «non-AIS vessels» are not detected by plotters</p> <p>Be able to account for the use of echo sounder as a navigational aid, e.g. for setting a position and assessing a safe voyage</p> <p>Give an account of the use of log data for navigational purposes and be aware of</p>
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	<p>integration/connection of instruments</p>	<p>Be familiar with the possibility to connect different instrument types and exchange data between them</p> <p>Be aware of the principles for communication and elementary connectivity methods</p> <p>Give an account of potential error sources with regards to relying on the produced data</p>	<p>Be able to account for how to connect different instruments along with associated advantages, disadvantages and risks</p> <p>Demonstrate basic knowledge of different versions of NMEA and the different sentences used, e.g. SOG, COG, HDG, etc.</p> <p>Demonstrate how this connection can be useful in practice</p>
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### 3.5 Annex 5: Handling the craft

	COMPETENCE	KNOWLEDGE, UNDERSTANDING AND PROFICIENCY	PRACTICAL TEACHING ADJUSTED TO VESSEL AND CONDITIONS
8.1a	Basic skills in preparation and control of a vessel	<p>Avoid the risk of trapping water in the fuel system</p> <p>Fuel filter and lubrication oil filter</p> <p>Diesel from tank to engine</p> <p>Lubrication oil</p> <p>Cooling system function and operation</p> <p>Methods to start and operate an engine and accessories on a recreational craft:</p> <ul style="list-style-type: none"> <li>- check the engine before start;</li> <li>- start the engine;</li> <li>- check the cooling system.</li> </ul> <p>Safety brief including the use of safety equipment</p> <p>Checking the weather forecast and taking it into consideration</p> <p>Estimating the fuel level and how long/far the vessel will operate based on this level</p>	<p>Drain the tank and filter and carry out a visual control of liquids</p> <ul style="list-style-type: none"> <li>- Exchange filters.</li> <li>- Mount and dismount filters.</li> <li>- Remove air from the diesel system.</li> <li>- Use an appropriate venting procedure.</li> <li>- Check and replenish.</li> <li>- Show the correct oil level on a gauge stick and demonstrate where to replenish lubricating oil.</li> <li>- Control the function of the cooling system and be aware of the consequences of potential malfunctions.</li> <li>- Read instruments, set an approximate temperature and demonstrate how it can be checked (outlet).</li> <li>- Start and operate the vessel's engine and describe similar procedures for other engine alternatives.</li> <li>- Give a briefing about safety equipment and general precautions that apply on board.</li> <li>- Give an account of the weather forecast and make an assessment with regard to the vessel and planned voyage.</li> <li>- Check the fuel tank and calculate the amount of fuel needed for the planned voyage.</li> <li>- Estimate time and distance and add a safety margin.</li> </ul>

8.1b	Have a basic proficiency in vessel handling when anchoring	<p>Correct placement of the fenders</p> <p>Assessing the anchor position, seabed conditions and obstructions. Assessing the size and strength of the anchor and anchor chains (e.g. using extra weight) with regard to the vessel and weather conditions</p> <p>Using sea-anchors in emergency situations, understanding the expected effect</p>	<ul style="list-style-type: none"> <li>- Actual placement of the fenders to avoid vessel damage.</li> <li>- Safe anchoring when deciding the anchor position and how much chain is needed to hold the force.</li> <li>- Use the sea-anchor and ropes correctly. Explain the general equipment control, deployment of equipment, rope length, how and where to fix the rope, assess the weather conditions and expected effects.</li> </ul>
8.1c	Basic proficiency in manoeuvring and having a good understanding of the interaction between the rudder and propeller	<p>Departure and arrival from/at port</p> <p>Interaction between engine, rudder and external forces</p> <p>Communication with the crew</p> <p>Observe and be aware of MOB situations, MOB pick up</p>	<ul style="list-style-type: none"> <li>- Plan and execute departure/arrival from/at port with regard to wind, current, port situation, available mooring equipment and crew.</li> <li>- Give correct and sufficient orders.</li> <li>- Use of springs at port departure.</li> <li>- Placing fenders and choosing hawsers.</li> <li>- Adjusted speed and approach at port arrival.</li> <li>- Proper berthing.</li> <li>- Manoeuvring the vessel at tight spaces demonstrating an understanding of the forces affecting the hull and rudder.</li> <li>- Making a stop by using the engine/propeller properly, taking external forces into consideration, such as wind and current.</li> <li>- Give sufficient and correct orders and be able to be understood by the crew.</li> <li>- Methods to avoid losing sight of the MOB.</li> <li>- Measures to be implemented in order to see the MOB at any time.</li> <li>- Choose an approach and speed.</li> <li>- Make a secure and controlled approach.</li> <li>- Procedures for rescuing persons from sea.</li> <li>- Maintain the safety for the rescue workers.</li> </ul>

8.1d	Basic proficiency in navigating the vessel night and day	<p>Position fixing and execution of the voyage in the daytime</p> <p>Position fixing and execution of the voyage in the dark</p> <p>Act in relation to other vessels and understand the Rules of the Road at Sea</p>	<ul style="list-style-type: none"> <li>- Terrestrial navigation, use of lateral and cardinal marks for position fixing and a safe coastal voyage in the daytime in good visibility.</li> <li>- Set the actual chart position in correspondence to navigational marks and to complete a safe voyage.</li>   <li>- Terrestrial navigation, observe and use lateral and cardinal marks for position fixing and a safe coastal voyage in the dark.</li> <li>- Set the actual chart position in correspondence to navigational marks and to complete a safe voyage.</li>   <li>- Correct use of the Rules of the Road at Sea.</li> <li>- Take the correct action at the starboard side of a vessel, the port side of a vessel, overtaking another vessel, being overtaken by another vessel, motor vessels vs sailing vessels, recreational craft vs commercial craft.</li> </ul>
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### 3.6 Annex 6: Diploma for a successfully and approved course

<<Skolens navn/dokumentidentifikasjon>>

#### Fritidsskipperkurs Vitnemål for fullført og bestått kurs for

\_\_\_\_\_  
Navn

\_\_\_\_\_  
fødselsnummer

Vitnemål nr: \_XXX\_

Det bekreftes herved at ovenfor identifiserte person har gjennomført fritidsskipperopplæring i henhold til læreplan av 15. april 2015 godkjent av Sjøfartsdirektoratet og har bestått eksamen med følgende resultat:

Emne	Fag	Eksamens- type	Eksamens- dato	Eksamens- karakter	Merknader
1	Navigasjon	Skriftlig			
2	Navigasjonshjelpemidler	Skriftlig			
3	Sjøveisregler og brovakthold	Skriftlig			
4	Skipslære	Skriftlig			
5	Sikkerhet	Skriftlig			
6	Teknologi/motorlære	Skriftlig			
7	Navigasjonshjelpemidler i praksis	Praktisk		Eks: Deltatt/ikke deltatt	
8	Håndtering av fartøy	Praktisk		Eks: Deltatt/ikke deltatt	
	Tilleggs kurs for utvidet fartsområde (D5LA)	Skriftlig			

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Skolens stempel og underskrift