



Higher National examination-based graded unit specification

General Information

This graded unit has been validated as part of the HND Nautical Science. Centres are required to develop the assessment instrument in accordance with this validated specification.

Graded unit title: Nautical Science: Graded Unit 3
(SCQF level 8)

Graded unit code: HT0N 35

Type of examination: Examination

Publication date: July 2017

Source: Scottish Qualifications Authority

Version: 01

Graded unit purpose

This graded unit is designed to provide evidence that the learner has achieved the following principal aims of the HND Nautical Science:

The main aim and objective of the HND Nautical Science is to provide a learner with the underpinning knowledge for the UK Maritime and Coastguard Agency Deck Officer Certificates of Competency.

This graded unit aims to ensure that a learner can draw together the information gained from the HN Units listed below with respect to the management of operational aspects of a Merchant Vessel and both analyse and process it at a level appropriate for the 'Chief Mate/Master' Unlimited Certificate of Competency. The following aims are covered.

- ◆ Develops the skills required to manage and control the safe navigation of the vessel in all conditions.
- ◆ Develops the skills required to manage and control vessel operations in compliance with current legislation.
- ◆ Develops a sound understanding of shipboard management issues and techniques.
- ◆ Develops a sound understanding of the ship Master's role with respect to the legal aspects of managing the navigation and operation of the vessel.
- ◆ Develops an understanding of the vessel's propulsion maintenance and engineering requirements.
- ◆ Prepares learners for the MCA written and oral examinations.

Higher National examination-based graded unit specification: General information (cont)

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Credit points and level

1 Higher National Unit credit at SCQF level 8: (8 SCQF credit points at SCQF level 8)

Recommended entry to the graded unit

It is recommended that the learner should have completed or is nearing completion of the following units relating to the above principle aims prior to undertaking this graded unit:

- ◆ *Ship Stability: Theory and Practical Application*
- ◆ *Management of Vessel Operations*
- ◆ *Shipmaster's Law and Business*

The term open-book within the context of this assessment means the learner can use the supplied publications from the 'List of permitted publications'.

Core Skills

There are no Core Skills embedded in this graded unit specification.

Assessment support pack

There is no assessment support pack for this unit.

Equality and inclusion

This graded unit has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence.

Further advice can be found on SQA's website:
www.sqa.org.uk/assessmentarrangements

Higher National examination-based graded unit specification: Designing the examination and assessing learners

Graded unit title: Nautical Science: Graded Unit 3
(SCQF level 8)

Assessment

This graded unit will be assessed by the use of an *open-book examination* allowing MCA approved publications listed on page four developed by centres. The examination should provide the learner with the opportunity to produce evidence that demonstrates she/he has met the aims of this graded unit.

The assessment is an examination lasting three hours.

The examination should be designed to assess the learner's critical knowledge and understanding of the topics relating to the specific aims which this graded unit is designed to cover.

The examination will be marked out of **100**. Only whole marks should be used.

The questions and corresponding marks should be designed in accordance with the key topics (ie the critical knowledge and skills to be covered in the examination), level of demand (eg description, explanation, analysis, application) and relative mark allocation for each key topic outlined in the table below.

Key topics	Level of demand	% mark allocation for each key topic
Maritime conventions	Recall	5%
Applications of commercial law to shipping operations.	Evaluate	15%
Cargo handling (Could include analysis of cargo safety measures and calculation of stowage information, ullages, etc.)	Analysis and calculation	20%
Port operations (Could include the planning requirements for loading/discharging bulk liquid/solid cargoes, passenger movement control procedures and analysis of cargo/hold test results.)	Analysis and planning	20%
Ship stability (Could include calculation of: loading details, free-surface effects, ice accretion, wind heeling moments. Analysis or evaluation of damage stability information with concluding recommendations.)	Calculation, analysis, evaluation and conclusion.	40%
Total marks for examination		100

Higher National examination-based graded unit specification: Designing the examination and assessing learners (cont)

Graded unit title: Nautical Science: Graded Unit 3
(SCQF level 8)

Conditions of assessment

The examination is *open-book* using MCA approved publications in this document.

The examination should be unseen and the assessment should be conducted in controlled and invigilated conditions.

At all times, the security, integrity and confidentiality of the examination must be ensured.

The assessment could be based on an examination paper consisting of six questions based on a practical ship loading problem, involving the learners solving problems covering the following HN Units:

- ◆ *Ship Stability: Theory and Practical Application*
- ◆ *Management of Vessel Operations*
- ◆ *Shipmaster's Law and Business*

The learner will be expected to answer examination questions without the aid of reference and/or source materials with the exception of marine publications and data sheets readily available on board ships as listed below and as specifically indicated for each assessment. Learners are also permitted to use only non-programmable calculators.

Learners will require access to MCA approved data tables and approved formulae sheets as listed below.

List of permitted publications:

- ◆ *Nautical Tables*
- ◆ *MCA Approved Extracts from the Nautical Almanac*
- ◆ *MCA Approved Extracts from Admiralty Tide Tables*
- ◆ *MCA Approved formulae sheets*
- ◆ *Navigational Charts/Chartlets*
- ◆ *Weather Charts*
- ◆ *Compass Deviation Cards*
- ◆ *Radar Plotting Sheets*
- ◆ *Co Tidal/Co Range Diagrams*
- ◆ *Ships Manoeuvring Data Sheet*
- ◆ *MCA Approved Trim and Stability Data Sheets*

Assessing and grading learners

Learners who meet the minimum evidence requirements will have their achievement graded as an A, B or C. The grade related criteria to be used to judge learner performance for this graded unit is specified in the following table.

Higher National examination-based graded unit specification: Designing the examination and assessing learners (cont)

Graded unit title: Nautical Science: Graded Unit 3
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Grade related criteria	
Grade A	Grade C
<p>Is a seamless, coherent piece of work or exam script which consistently:</p> <ul style="list-style-type: none"> ◆ Demonstrates a depth of understanding of current national, international legislation and conventions applicable to merchant vessel. ◆ Provides evidence of sound knowledge of calculation procedures involving cargo operations. ◆ Demonstrates understanding of the procedures involved in the loading, discharging and care of cargoes. There will be references to the applicable regulations and conventions contained within the solution. ◆ Exemplifies clear and accurate working of stability problems, with diagrams where appropriate, to provide the assessor with additional evidence of a learner's understanding and ability to analyse data. 	<p>Is a co-ordinated piece of work or exam script which:</p> <ul style="list-style-type: none"> ◆ Provides evidence that a learner is aware of current national, international legislation and conventions applicable to merchant vessel. ◆ Demonstrates that learners can perform cargo calculations. ◆ Provides evidence that the learner is aware of accepted procedures for cargo operations. ◆ Demonstrates that stability problems can be analysed and calculations performed accurately.

The marks achieved by the learner in the examination should be aggregated to arrive at an overall mark for the examination. Assessors will then assign an overall grade to the learner for this graded unit based on the following grade boundaries.

A = 70%–100%
B = 60%–69%
C = 50%–59%

These grade boundaries are fixed and should **not** be amended.

If a learner does not achieve a pass or wishes to upgrade, then this must be done using a substantially different examination. In these circumstances, the highest grade achieved should be awarded.

More information on reasonable assistance, remediation and re-assessment may be found in the SQA publication *Guidance for the Implementation of Graded units in Higher National Certificates and Diplomas* (SQA, 2008, Publication code: CA4405).



Higher National examination-based graded unit support notes

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Guidance on approaches to delivery and assessment of this graded unit

The paper should be designed to thoroughly test the learner's ability to carry out the duties of the Chief Mate/Master whilst in charge of loading or discharging or caring for cargo on a voyage.

The examination should be conducted under open-book, supervised conditions, like those required for the Maritime and Coastguard Agency (MCA) written examinations at Officer of the Watch level.

Opportunities for developing Core and other essential skills

There are no Core Skills embedded in this graded unit specification.

History of changes to graded unit

Version	Description of change	Date

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General information for learners

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This graded unit is designed to ensure that you can draw together the knowledge and skills across the range of HN Nautical Science Units that are sampled in the assessment. This assessment and feedback will provide you with the preparatory work required for MCA external exam for Chief Mate stability. Assessment will usually be conducted after the three units have been completed.

The format of the assessment is an open-book examination in which you will have access to MCA approved data and formulae sheets. Programmable calculators will not be permitted in the examination.

Questions will be structured so that they are, as far as possible, relevant to the actual responsibilities which you will take on in the role of the Officer of the Watch, whilst keeping a deck watch in port, when the vessel is working cargo.

You may be required to interpret information presented in graphical format and you will be asked to produce sketches. Sketches should be clear and in the correct proportion.

In the case of calculations all working should be shown and intermediate steps should be shown. Draughts should be calculated to the nearest millimetre and angles of heel/list to a single decimal place of a degree. Weights should be accurate to the nearest tonne.

Grades:

A	=	70% and above
B	=	60% to 69%
C	=	50% to 59%
Fail	=	below 50%