



National Unit Specification: general information

UNIT Shipbuilding Technology (SCQF level 6)

CODE F5FA 12

SUMMARY

This Unit can be taken as part of a National Qualification Group Award in Engineering but can also be taken as a free-standing Unit by candidates who wish to enhance their knowledge in the shipbuilding industry and in a fabrication and welding environment. It is also suitable for candidates who are studying the subject for the first time.

This Unit will enable candidates to define shipbuilding terms and abbreviations, and understand the effect of forces on assemblies during ship construction and launching. Candidates will be able to recognise the methods used in the pre fabrication of ships' structures. They will be able to identify methods used to transfer the completed ships' structure from land to water.

OUTCOMES

- 1 Define terms and abbreviations used in shipbuilding.
- 2 Produce a scaled drawing of mid-ships sections for various types of vessel.
- 3 Identify the main methods of maintaining form and shape of ship structures during stern launching.
- 4 Identify common methods of launching ships.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

Administrative Information

Superclass: XQ

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National Unit Specification: general information (cont)

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CREDIT VALUE

1 credit at Higher (6 SCQF credit points at SCQF level 6*).

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates*

CORE SKILLS

There are opportunities to develop the Core Skills of *Problem Solving, Numeracy* and *Information Technology* at SCQF level 6 in this Unit, although there is no automatic certification of Core Skills or Core Skills components.

National Unit Specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Define terms and abbreviations used in shipbuilding.

Performance Criteria

- (a) Shipbuilding terms and abbreviations are correctly defined according to industry standards.
- (b) Drawing terms and abbreviations are correctly interpreted from plans and specifications.
- (c) Directional terms are correctly identified.

OUTCOME 2

Produce a scaled drawing of mid-ships sections for various types of vessel.

Performance Criteria

- (a) The illustration and naming of the main structural arrangements for the mid ships sections of merchant vessels are correct.
- (b) The illustration and naming the main structural arrangements for the mid ships sections of naval vessels are correct.

OUTCOME 3

Identify the main methods of maintaining form and shape of ship structures during stern launching.

Performance Criteria

- (a) The use of datums, keel blocks and support shores are correctly described.
- (b) The use of fairing aids used in prefabrication of ships Units is correctly described.
- (c) The use of levelling techniques is correctly described.

OUTCOME 4

Identify common methods of launching ships.

Performance Criteria

- (a) The description of stern launching is accurate.
- (b) The description of side launching is accurate.
- (c) The description of launching in a dry dock is accurate.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Evidence is required to demonstrate that the candidates have achieved all of the Outcomes and Performance Criteria.

Evidence for this Unit will be in the form of closed-book written and/or recorded oral evidence produced under controlled and supervised conditions lasting no more than two hours in total.

The evidence must be produced on one assessment occasion towards the conclusion of the Unit and the candidate will:

Outcome 1

Define **five** terms and abbreviations used in:

- ◆ shipbuilding
- ◆ shipbuilding drawings and

Five directional terms.

Outcome 2

Produce a scaled drawing of mid-ships sections for **two** types of vessel.

Outcome 3

Identify **eight** items or components from a given drawing of a ships structure on the 'sliding ways'.

Outcome 4

Identify **two** common methods of launching ships.

National Unit Specification: support notes

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This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

The Unit is in the National Qualification Group Award (NQGA) in *Fabrication and Welding Engineering* but it may also be taken on a free-standing basis.

The Unit content/context will consist of:

- ◆ Parts of the ship's parts/structure from given abbreviations.
- ◆ Ships drawing terms and correct reading of the data and information shown on these types of plans.
- ◆ Diagrams to indicate directions aboard ship such as forward/aft/amidships, inboard/outboard/athwart ships, bow, port/starboard, beam, port/starboard, stern, port/starboard quarters, above/topside/aloft, below, on deck/below deck.
- ◆ General arrangement of ship types, eg Bulk/General cargo, Container vessels, Bulk carriers, oil tankers, frigates and destroyer
- ◆ Elevation of a ship showing engine-room, fore and after peak tanks, double-bottom tanks and position of bulkheads.
- ◆ Scaled diagrams and understand the major hull dimensions of the ship types given above.
- ◆ Methods used to support a ship on the slipways and correct description of the function of the following items; keel block and sights, support shores, standing ways and sliding ways.
- ◆ Strong-backs, bridges, chain blocks, declivity sticks and boards and their function in ship construction.
- ◆ Lasers, water tube levels, dumpy levels and ancillary equipment used to maintain plumb and square
- ◆ Main parts of the equipment and understand the techniques employed to launch ships either by the stern, side or dry dock method.
- ◆ The function of fore and aft poppets, standing and sliding ways, greasing irons, launching lubricants, drag chains.
- ◆ Methods of arresting a ship once stern launched.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

It is envisaged that the Unit will be taught using models of ships' structures and actual ships' drawings. Internet websites such as ship-technology.com and naval-technology.com will provide a wealth of information and candidates should be encouraged to visit these sites through the use of guided study sessions.

The main structural arrangement of a profile and mid-ship section of given vessels could be shown via power point presentations and industry videos. Incomplete illustrations of ships' structures and or ship types can be used to reinforce the candidates' understanding of the subject.

National Unit Specification: support notes (cont)

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Various specific structural steel members should be shown and their appearance and function are explained.

The effects of stress on vessels at sea are discussed. Hogging, sagging, racking, panting and pounding are examined and related to the need to strengthen areas of the vessel.

The need for a planned layout of vessel assembly is highlighted. Sequences of erection are discussed along with the tools and equipment utilised within a shipbuilding environment to facilitate assembly.

The methods used for the launching of a vessel are explained. Conventional slipway and other methods such as building dock and syncrolift are discussed. The use of incomplete handouts, overhead transparencies, photographs, videos and related publications will be used in presentations along with the use of actual drawings of ships structures.

This Unit should be delivered by a combination of teaching and learning approaches which could include:

- ◆ Lecturing
- ◆ Case studies
- ◆ Practical activities
- ◆ Group discussions
- ◆ Tutorials
- ◆ Directed study
- ◆ Investigation including the use of ICT
- ◆ Site visits
- ◆ Audio visual
- ◆ Guest speakers

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

Exercises to support development of relevant Core Skills will be an aspect of formative work across the award, with an emphasis on efficient application of skills in workplace situations. Class discussions during formative work will support understanding and analytical evaluation of the effect of forces on assemblies during ship construction and launching, and the structural stresses on vessels at sea. *Problem Solving* skills such as critical thinking, planning, organising, and reviewing and evaluating, could be effectively developed and enhanced as theoretical knowledge is analysed and applied to the production of scaled drawings. The ability to interpret, calculate and translate numerical and graphical data in a practical working context will underpin the analysis and production of scaled drawings of mid-ships sections.

Guided study giving access to technology and advice on relevant web sites and software will provide essential knowledge and an awareness of current methodology and design approaches in shipbuilding.

National Unit Specification: support notes (cont)

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GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

It is suggested that the Unit is assessed by an end of Unit question paper that contains a mix of short answer, identification type questions, and grid questions.

Outcome 1

Candidates could complete 15 short answer type questions, 5 from each Performance Criteria, where they define terms and abbreviations used in shipbuilding.

Outcome 2

Candidates could produce a scaled drawing of mid-ships sections for any two types of vessel.

Outcome 3

The candidates could successfully identify items or components from a given drawing of a ship's structure on the 'sliding ways'.

Outcome 4

The candidates could successfully identify common methods of launching ships.

CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).