

NAUTICAL SCIENCE

2020 ONLY

GRADE 12

1. NO Curriculum Trimming

2. Assessment:

Current SBA Requirements:

TERM 1	TERM 2	TERM 3	TERM 4
Task 1: Test Topic 1 Navigation 50 marks	Task 3: Research Task Environmental Challenges 50 marks	Task 5: Test Topic 2–4 50 marks	Task 7: Exam Paper 1 Topic 1 Practical Navigation 150 marks Paper 2 Theory Topic 2, 3, 4 150 marks
Task 2: Practical Assignment: Astro navigation problem 50 marks	Task 4: Midyear exam Paper 1 Topic 1 Practical Navigation 150 marks Paper 2 Theory Topic 2, 3, 4 150 marks	Task 6: Preliminary exam Paper 1 Topic 1 Practical Navigation 150 marks Paper 2 Theory Topic 2, 3, 4 150 marks	
100 marks	350 marks	350 marks	300 marks
800 marks divided by 8 = 100 marks			

Amended SBA Requirements for 2020:

1. Remove Task 3 : Research Task – Environmental Challenges
2. Remove Task 4: Midyear exam
3. Remove Task 5 : Test Topic 2-4
4. Portfolio Total Mark changed to 400
5. Mark to be converted to a percentage (mark out of 100)

Descriptions	Mark
Task 1: Test Topic 1	50
Task 2: Practical Assignment	50
Task 6: Preliminary Examination	300
Total Marks:	400
Mark to be submitted out of 100 [400 divided by 4 = 100 marks]	/100

GRADE 10 & GRADE 11

CURRICULUM ADJUSTMENTS

With reference to the National Curriculum Statement, Grades 10–12 (General), Nautical Science (Dated 28 July 2006), the following adjustments to Chapter 3, "Learning Outcomes, Assessment Standards, Content and Context", the suggested adjusted content has been attached.

For each Learning Outcome (LO) the most important Assessment Standards (AS) have been highlighted (*) as "Should be covered in this year (2020); with **Emphasis** on a relevant principal of the topic.

It is recommended that the AS **not** highlighted (*) may be covered either superficially or omitted in the remainder of the year depending on the time allowed.

Sections of the curriculum that have not been fully covered or have been omitted during this year (2020) **MUST** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12. This will have to be sandwiched into the planned schedule for 2021.

It should be noted with appreciation the ingenuity of the Nautical Science educators at this difficult time as they provide for the learners such an opportunity to have a grounding in the marine industry, to learn the vital importance of shipping to the economy of the country and the career opportunities that are available to them.

It is not known to what level the different schools have completed within the first term of this year (2020), and cognizance of this should be taken into account in the suggested adjustment laid out in the attached Suggested Adjustments to the LO contents and programme of assessment.

		Grade 10	Grade 11
1	Any proposal for reduction of curriculum content in any subject	The following should be covered this year with emphasis as indicated: AS 10.1.1, 10.1.2; AS 10.2.2, 10.2.3; AS 10.3.1, 10.3.2; AS 10.4.1, 10.4.3.	The following should be covered this year with emphasis as indicated: AS 11.1.1, 11.1.2, 11.1.3; AS 11.2.3; AS 11.3.2; AS 11.4.1, 11.4.2.
2	(All SBA requirements for term 1 must be met) What are the SBA requirements for term 2, 3 and 4 (what is being excluded)	Term 3 suggest set one task LO 1 Navigation in a section not covered in class (e.g. AS 10.1.4 on research of magnetic compass). Final exam reduced to cover only sections that have been taught. Marks for Papers 1 & 2 reduced appropriately.	Term 3 suggest set one task LO 2 Seamanship in a section not covered in class (e.g. AS 11.2.2 on cargo or rigging). Final exam reduced to cover only sections that have been taught. Marks for Papers 1 & 2 reduced appropriately.
3	SBA requirements	Suggested Term 3 Task 100 marks. Suggested End of year exam Papers 1 & 2 75 marks each total 150 marks.	Suggested Term 3 Task 100 marks. Suggested End of year exam Papers 1 & 2 75 marks each total 150 marks.

APPENDIX**NAUTICAL SCIENCE****SUGGESTED ADJUSTMENTS DUE TO THE SHORTENED STUDY TIME 2020****CHAPTER 3****LEARNING OUTCOMES, ASSESSMENT STANDARDS, CONTENTS AND CONTEXT****GRADE 10****Learning Outcome 1****Assessment Standards****Nautical Navigation**

The learner is able to explain, interpret and apply navigational principles and processes.

We know this when the learner is able to:

AS = Assessment Standard)

AS 10.1–2

Should be covered in this year (2020).

Emphasis on chart work and the relevant principals of navigation.

 AS 10.1.1

Use basic navigational terminology to explain navigational principles, concepts and procedures.

 AS 10.1.2

Identify and use sources of data that provide information for navigational processes to calculate and plot positions and lay off courses using bearings.

 AS 10.1.3

Plan a coastal passage between two geographical positions on a nautical chart using data obtained from the observation of terrestrial objects, features and navigational publications.

AS 10.1.3–4

Recommend these sections may be covered superficially or omitted this year (2020).

 AS 10.1.4

Explain the types and use of compasses for the measurement of direction at sea and the reasons and processes for correction.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 11**Learning Outcome 1****Navigation****AS 11.1.1–3**

Should be covered in this year (2020).

Emphasis on time, celestial navigation, nautical publications, tides, sailings and courses, distances and vessel geographical position.

AS 11.1.4

Recommend this section may be covered superficially or omitted this year (2020).

Assessment Standards**We know this when the learner is able to:**

- AS 11.1.1**
Analyse and explain navigational principles and concepts.
- AS 11.1.2**
Gather and analyse information using navigational instruments, nautical tables, publications and instrumental observations of the sun.
- AS 11.1.3**
Use prescribed mathematical models (sailings) and formulas, and data obtained from nautical tables, to calculate distances, time of passage and courses between geographical positions.
- AS 11.1.4**
Explain the principle, construction and use of a sextant as a navigational instrument.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 10**Learning Outcome 2****Assessment Standards****Seamanship**

The learner is able to demonstrate knowledge, understanding and practical application of the various aspects of seamanship.

We know this when the learner is able to:

AS 10.2.2–3

Should be covered in this year (2020).

Emphasis on safety equipment and practices.

 AS 10.2.1

Use nautical terminology to describe, illustrate and explain the various types of seagoing vessels utilising South African ports.

 AS 10.2.2

Demonstrate the ability to carry out prescribed rope work and explain the various types of cordage used at sea.

 AS 10.2.3

Describe the basic **safety equipment and practices** found aboard seagoing vessels and explain the need for safety precautions taken onboard.

AS 10.2.1 and 4

Recommend these sections may be covered superficially or omitted this year (2020).

 AS 10.2.4

Identify, describe and compare the various roles of deck personnel and perform the duties of a member of the crew of a small sailing vessel.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 11**Learning Outcome 2****Seamanship****Assessment Standards****We know this when the learner is able to:** **AS 11.2.1**

Analyse the factors and forces affecting the handling of vessels at sea.

 AS 11.2.2

Explain the use of various types of rigging, cranes and derricks and the calculation of the advantage obtained by various arrangements of blocks and tackles to load, discharge or move objects or cargo handling onboard a ship.

AS 11.2.3

Should be covered in this year (2020).

Emphasis on International Regulations for Preventing Collisions at Sea, and the IALA System of buoyage.

 AS 11.2.3

Consider, evaluate and recommend the factors to be considered and rules and procedures to be followed in the event of various types of emergency situation arising at sea.

AS 11.2.1, 2 and 4

Recommend these sections may be covered superficially or omitted this year (2020).

 AS 11.1.4

Investigate, categorise and compare Nautical Science related careers including a background training required and the types of work activity involved.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 10**Learning Outcome 3****Assessment Standards****Meteorology**

The learner is able to explain, interpret and evaluate the effect of weather on the planning and execution of ocean voyages and shipping operations.

We know this when the learner is able to:

AS 10.3.1–2

Should be covered in this year (2020).

Emphasis on meteorological instruments.

 AS 10.3.1

Explain the various sources of meteorological data used by the mariner.

 AS 10.3.2

Describe the various meteorological **instruments** carried onboard a sea-going vessel and explain what they measure.

AS 10.1.3–4

Recommend these sections may be covered superficially or omitted this year (2020).

 AS 10.3.3

Explain the various elements and processes in the formation of weather, how they interact with each other and how they affect the sea conditions.

 AS 10.3.4

Describe meteorological factors that impact on shipping in the port and at sea.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 11**Learning Outcome 3****Meteorology****Assessment Standards****We know this when the learner is able to:** **AS 11.3.1**

Conduct a **synoptic chart** reading of weather patterns to predict the effect of weather systems on the planning of ocean voyages.

 AS 11.3.2

Distinguish between the different **isobaric systems** found at sea and explain their influence on navigation.

 AS 11.3.3

Evaluate the influence of sea currents on weather patterns and the impact on navigation off the South African coast.

AS 11.3.2

Should be covered in this year (2020).

Emphasis on the various isobaric systems and the identification of them from the synoptic chart.

AS 11.3.1 and 3

Recommend these sections may be covered superficially or omitted this year (2020).

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 10**Learning Outcome 4****Assessment Standards****Maritime Communications**

The learner is able to recognise, interpret and utilise a variety of communication method, modes and procedures used at sea to enhance nautical safety.

We know this when the learner is able to:

AS 10.4.1 and 3

Should be covered in this year (2020).

Emphasis on procedures.

 AS 10.4.1

Identify what **procedures** should be followed as well as signals and codes used for communicating at sea.

AS 10.4.2

Recommend this section may be covered superficially or omitted this year (2020).

 AS 10.4.2

Identify and compare the strengths and weaknesses of the various methods of communication at sea.

 AS 10.4.3

Interpret the single meanings of prescribed signal flags used for communicating at sea.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

GRADE 11**Learning Outcome 4****Communications****AS 11.4.1–2**

Should be covered in this year (2020).
Emphasis on effective and efficient communications and distress message procedures and protocol.

AS 11.4.3

Recommend this section may be covered superficially or omitted this year (2020).

Assessment Standards**We know this when the learner is able to:**

- AS 11.4.1**
Identify good operator practices used for **effective and efficient communications** at sea using a manual system.
- AS 11.4.2**
Demonstrate the use of **distress frequencies**, the significance of distress periods and the procedures used for distress communications at sea.
- AS 11.4.3**
Pass messages utilising the phonetic alphabet and explain its purpose and value.

Any of these sections that are not fully covered or omitted this year (2020), **must** be covered at some point before the learners attempt the NSC examinations at the end of Grade 12.

REVISED PROGRAMME OF ASSESSMENT (300 marks)	
ASSESSMENT TASKS	END-OF-YEAR ASSESSMENT
25%	75%
<ul style="list-style-type: none"> • 2 tests • 1task 	<ul style="list-style-type: none"> • 2 written exams LO 1–4 • Paper 1 – 150 marks • Paper 2 – 150 marks

EXAMPLE OF A PROGRAMME OF ASSESSMENT FOR GRADE 10

TERM 1	TERM 3	TERM 4
Task 1: Test LO 1: Navigation 50 marks	Task 5: Test LO 1 50 marks	Task 7: Exam Paper 1: Practical LO 1: Navigation Paper 2: Theory LO 2, 3, 4
Task 2: Practical Assignment: Practical sailing 50 marks		
150 marks – converted to a mark out of 25		300 marks – converted to a mark out of 75
Promotion Mark : /100		

EXAMPLE OF A PROGRAMME OF ASSESSMENT FOR GRADE 11

TERM 1	TERM 3	TERM 4
Task 1: Test LO 1: Navigation 50 marks	Test work covered Task 5: Test LO 2–4 50 marks	Task 7: Exam Paper 1: Practical LO 1: Navigation Paper 2: Theory LO 2, 3, 4
Task 2: Practical Assignment: Safety at sea 50 marks		
150 marks – converted to a mark out of 25		300 marks – converted to a mark out of 75
Promotion Mark : /100		

TASKS

In addition to the two tests and one examination in Grade 10 and 11 Programmes of Assessment, Nautical Science learners should also be assessed in one other task such as practical sailing a small boat assignment, meteorology and communication assignment and/or a research task. ~~See Appendix A for ideas of research tasks and assignments.)~~

TESTS

The suggested outline for tests is as follows:

- Minimum of 50 marks
- Duration: 1 hour
- Questions at different cognitive levels

Each task and examination must cater for a range of cognitive levels and abilities of learners. The following is used as a guide to compile tasks and examination questions encompassing the different cognitive levels: See Appendix B for Bloom's Taxonomy of Cognitive Levels.

COGNITIVE LEVEL	PERCENTAGE	MARKS
Knowledge	30	90
Comprehension	20	60
Application	30	90
Analysis, evaluation and synthesis	20	60
	100 percentage	300 marks

EXAMINATIONS IN GRADES 10 AND 11

The ~~midyear~~ and end-of-year examination papers should test the knowledge and skills covered in the four Nautical Science Learning Outcomes. The preparatory examinations need to be closely related to the final examination in terms of time allocation, layout of paper and mark allocations.

The examination mark, which is the raw score in June and September, must be used for the calculation of the internal assessment mark for promotion purposes.

The following table suggests the outline for examinations in Grades 10 and 11.

	MARKS Grade 10	
	PAPER 1	PAPER 2
Time	3 hours	3 hours
Marks	150 marks	150 marks
Learning Outcomes	LO 1	LO 2, 3, 4
Questions (All questions compulsory)	Practical chart work and navigation calculations	Seamanship, meteorology and communications
TOTAL	150 marks	150 marks

	MARKS Grade 11	
	PAPER 1	PAPER 2
Time	3 hours	3 hours
Marks	150 marks	150 marks
Learning Outcomes	LO 1	LO 1, 2, 3, 4
Questions (All questions compulsory)	Practical chart work and astro-navigation	Seamanship, meteorology, communications and sailings
TOTAL	150 marks	150 marks

3.4 Assessment in Grade 12

In Grade 12, assessment consists of two components: a Programme of Assessment which makes up 25% of the totals mark for Nautical Science and external assessment which makes up the remaining 75%. The Programme of Assessment for Nautical Science comprises six (6) tasks, which are internally assessed. The external assessment component includes two written papers making up the remaining 75%. The external assessment tasks are externally set and moderated.