
MARINE ENGINEER

The International comparability of Marine Engineering education qualifications is ensured through the SAMSA code (GOP-530.03) and Manila 2010 Amendments.

In all engineering disciplines, the continuous and rapid development of complex technology necessitates higher levels of conceptual understanding required by the broadly defined problem solving skills needed. Adaptability to new technologies furthermore relies heavily on the understanding and the ability to apply fundamental conceptual knowledge. Therefore, with the advanced knowledge base required to operate in this ever modernising environment, the Marine Engineering practitioner will need not just an understanding, but an intricate knowledge of engineering technology. This will require this qualification to be at an Engineering Technology level as with the Mechanical and Electrical Engineering qualifications’.

NOTE: the term “Broadly defined” is used due to the broad spectrum of knowledge areas that a Marine Engineering Officer will have to have as a foundation to perform their task. A modern vessel is basically a “Mini City” incorporating, Mechanical components, Electrical (Power generation) , electronic (maintenance of electronic equipment), Water purification, sewage processes and structural knowledge.

Note: The Level Descriptor: Broadly, defined Marine Engineering problems applicable to this Qualification are characterised by:

- *A requirement for coherent and detailed Marine Engineering knowledge, encompassing Mechanical/Electrical/Mechatronic knowledge, underpinning the Marine technology area and one or more of problems that:*
 - *are ill-posed, or under or over specified, requiring identification and interpretation into the technology area;*
 - *encompass systems within complex engineering systems;*
 - *belong to families of problems which are solved in well-accepted but innovative ways;*
 - *can be solved by structured analysis techniques;*
 - *may be partially outside standards and codes; must provide justification to operate outside said standards and codes.*
 - *involve a variety of issues, which may impose conflicting needs and constraints; technical, engineering and interested or affected parties.*

Exit Level Outcome 1:

Apply engineering principles to systematically diagnose and solve broadly-defined Marine Engineering problems.

Exit Level Outcome 2:

Apply knowledge of mathematics, natural science and engineering sciences to defined and applied Marine Engineering procedures, processes, systems and methodologies to solve broadly-defined Marine Engineering problems.

Exit Level Outcome 3:

Perform procedural and non-procedural design of broadly defined Marine components, systems, works, products or processes to meet desired needs normally within applicable standards, codes of practice and legislation.

Exit Level Outcome 4:

Conduct investigations of broadly-defined marine related problems through locating, searching and selecting relevant data from codes, data bases and literature, designing and conducting experiments, analysing and interpreting results to provide valid conclusions.

Exit Level Outcome 5:

Use appropriate techniques, resources, and modern engineering tools, including information technology, prediction and modelling, for the solution of broadly-defined marine engineering problems, with an understanding of the limitations, restrictions, premises, assumptions and constraints.

Exit Level Outcome 6:

Communicate effectively, both orally and in writing, with Marine engineering audiences and the affected parties.

Exit Level Outcome 7:

Demonstrate knowledge and understanding of the impact of Marine engineering activity on the society, economy, industrial and physical environment, and address issues by analysis and evaluation

Exit Level Outcome 8:

Demonstrate knowledge and understanding of Marine engineering management principles and apply these to one's own work, as a member and leader in a team and to manage in the vessel engineering support systems.

Exit Level Outcome 9:

Engage in independent life-long learning

Exit Level Outcome 10:

Comprehend and apply ethical principles and commit to professional ethics, responsibilities and norms of Marine engineering technology practice.

Course Duration:	3 YEARS
Appointed Instructors:	Sergio Giannotti, Coc 1 st class Chief engineer, Marine Engineer Lecturer, Nelson Mandela University
	John Fernandes, BTech Electrical Eng., MEng. Mechatronics, Lecturer Electrical System and Automation, Nelson Mandela University
	Boswell Douse, BTech Mechanical, Nelson Mandela Metropolitan University, Msc Marine engineering (Naval Architecture) University of Southampton
Assessors:	External

COURSE OUTLINE & TIME FRAME

See study guide

See attachment 1

COURSE ASSESMENT

Continuous assessment, each semester will have 2 test and a final exam.

COURSE CERTIFICATION

We possess ISO 9001.2008 certification and the scope of certification is performing of expert courses for seamen and industrial workers. The Marine/offshore high voltage safety course is a SAMSA class approved training course and it complies with the selected topics of the STCW 2010 regulations.

VENUE:

NELSON MANDELA UNIVERSITY

NORTH CAMPUS

GARDHAM AVENUE – E-BLOCK –

SUMMERSTRAND - PORT ELIZABETH - 6010

Minimum Requirements:

- The table below explains how well you will need to do in your school subjects to meet the minimum entry requirements for each type of qualification.
- It is important to note that the table refers to minimum entry requirements.
- The university may add additional requirements for specific programmes.

Qualification	Minimum Statutory Entry Requirement
Higher Certificate	Pass on the NSC
Diploma	Pass NSC with: An achievement rating of 3 (40 -49 %) or better in four subjects, together with any other university requirements.

Bachelors Degree	Pass NSC with: An achievement rating of 4 (50 - 59 %) or better in four subjects from the designated list, together with any other university requirements.
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Designated subjects

- Applicants who wish to enroll for a degree programme need to ensure that four of their seven subjects are from the designated list.
- The list already includes three of the four compulsory subjects for obtaining the NSC, namely, Languages, Maths or Maths Literacy.
- A learner must then select one or more subjects from the list below, provided that they are not from the same group in order to apply for a degree programme.

Accounting	Languages
Agricultural Sciences	Life Sciences
Business Studies	Mathematics or Mathematical Literacy
Dramatic Arts	Music
Economics	Physical Sciences
Engineering Graphics and Design	Religion Studies
Geography	Visual Arts
History	Consumer Studies
Information Technology	

How to calculate your Admission Point Score (APS)

- The APS system allocates point values to the levels of achievement obtained for your matric subjects.
- Write down your relevant NSC subjects and the levels obtained.
- Allocate points according to the table below.
- Add up the number of points you have to calculate your APS.
- Alternatively, **use our online APS calculator**

Table A: School Performance Score (SPS)

NSC	NSC %	APS	APS Percentage
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		8	90 -100 %
7	80 -100 %	7	80 -89 %
6	70 -79 %	6	70 -79 %
5	60 -69 %	5	60 -69 %
4	50 -59 %	4	50 -59 %
3	40 -49 %	3	40 -49 %
2	30 -39 %	2	30 -39 %
1	0 -29 %	0	0 -29 %

Example 1

To enrol for the National Diploma: Journalism you need an Admission Point Score (APS) of at least 32, as well as a National Senior Certificate (NSC) pass in English on at least level 4 (50 -59 %).

NSC Subject	NSC %	Level	APS Points allocated
English	65 %	5	5
Xhosa	60 %	5	5
Mathematics	70 %	6	6
Geography	55 %	4	4
History	80 %	7	7
Life Orientation	74 %	6	6
Accounting	71 %	6	6
Admission Point Score	39		

This student has met the minimum requirements for admission to the National Diploma (Journalism).

Example 2

To enrol for the BCom (Accounting for Chartered Accountants) you need an Admission Point Score (APS) of at least 38, as well as four subjects from the designated list and a pass in Mathematics on at least level 5 (60 -69 %).

Matric Subject	NSC %	Level	APS Points Allocated
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English	70 %	6	6
Afrikaans	80 %	7	7
Mathematics	69 %	5	5
Accounting	65 %	5	5
Life Orientation	60 %	5	5
Physical Science	74 %	6	6
Life Sciences	81 %	7	7
Admission Point Score	41		

This student has met the minimum admission requirements for the BCom (Accounting for Chartered Accountants) programme.

Additional requirements

In addition to the minimum APS requirement, additional subject requirements have been set. These include:

1. **Mathematics:** This is required for certain programmes. Only performance in the core Mathematics topics (papers 1 and 2) will be used when making admission decisions. However, school learners are encouraged to also take the optional Mathematics topics. In certain programmes, applicants who have Mathematical Literacy instead of Mathematics may be admitted to a programme where a Mathematics entry requirement has been set. In this instance, additional modules may be added to the programme, which may extend the length of the programme.
2. **Mathematical Literacy:** In view of the importance of quantitative literacy for success at Higher Education studies, a minimum of a 3 (40-49%) for Mathematical Literacy is preferred for likely admission to National Higher Certificate and National Diploma programmes and a 4 (50-59%) for likely admission to degree programmes where Mathematics is not a requirement, unless otherwise indicated.

***Disclaimer:** All reasonable steps have been taken to ensure that the information contained on the website is accurate at the date it was published. Nelson Mandela University reserves the right to make changes to the programme details (e.g. rules, admissions requirements) as published on the website. Prospective students are advised to consult the admissions department prior to applying.*

Further Information: Marine Engineering at the Nelson Mandela University:

Bachelor of Engineering Technology (Marine Engineering):

-3 Year Undergraduate degree with 4th year honours.

-ECSA (Engineering Council of South Africa) endorsed at registration level: Professional Engineering Technologist (Pr Tech Eng)

-SAMSA (South African Maritime Safety Authority) recognised

General Information:

Two primary career paths in Marine Engineering:

1 - Ship (or marine) Engineering Officers or, simply, Ship Engineers (Seafarers)

Responsible for operating and maintaining the propulsion plants and support systems on board crew, passengers and cargo seafaring vessels or other watercraft. Alternative terms commonly employed to collectively refer to the profession are seagoing or seafaring engineer officers. They are responsible for propulsion and other ship systems such as: electrical power generation plant; lighting; fuel oil; lubrication; water distillation and separation; air conditioning; refrigeration; and water systems on board the vessel. They require knowledge and hands-on experience with electric power, electronics, pneumatics, hydraulics, chemistry, steam generation, gas turbines and even nuclear technology on certain military and civilian vessels. [[https://en.wikipedia.org/wiki/Engineering_officer_\(ship\)](https://en.wikipedia.org/wiki/Engineering_officer_(ship))]

The course provides an opportunity for Marine Engineer Officers (or aspirant marine engineer officers) to obtain both degree and a STCW95 compliant certificate of competency, through SAMSA, following the career route to the highest level of Chief Engineer.

Seafarer Career Progression Levels:

-Cadet: A trainee officer. Understudies the other engine department personnel

-Fourth Engineer 3rd Assistant Engineer: Usually in charge of air compressors, purifiers, pumps and other auxiliary machinery. Takes the 8–12 watch. Sometimes in charge of boilers

-Third Engineer 2nd Assistant Engineer: Usually in charge auxiliary engines & boilers. Takes the 12–4 watch

-Second Engineer 1st Assistant Engineer: In charge of the day-to-day running of the engine department. Often in charge of main engine maintenance. Takes the 4–8 watch. He is the equivalent of the Chief Mate

-Chief Engineer: In charge of the engine department. Reports only to the Master. The Chief Engineer's training, responsibility and rank are all superior to those required for a Chief Officer

Career opportunities also exist in the shore-based maritime industry, particularly for those persons who ultimately wish to terminate their sea-going employment. There are medical and fitness requirements due to the sea-going environment that will need to be considered if considering a career at sea(see www.samsa.org.za search the GOP-538.01 - The Maritime Medical Standards Code)

2 - Marine engineering (Naval Architecture)

The engineering(design/maintenance/Modification/Construction) of boats, ships, oil rigs and any other marine vessel or structure, as well as oceanographic engineering. Specifically, marine engineering is the discipline of applying engineering sciences, including mechanical engineering, electrical engineering, electronic engineering, and computer science, to the development, design, operation and maintenance of watercraft propulsion and on-board systems and oceanographic technology. It includes but is not limited to power and propulsion plants, machinery, piping, automation and control systems for marine vehicles of any kind, such as surface ships and submarines [https://en.wikipedia.org/wiki/Marine_engineering]

-Admission points score of 36

-Minimum NSC requirements for degree studies must be met

-Language of Teaching and Learning (English) on at least level 4 (50-59%).

-NSC achievement rating of at least 5 (60-69%) for Mathematics.

-NSC achievement rating of at least 4 (50-59%) for Physical Sciences

-Applicants with an Admission Points Score between 30 and 35 may be referred to write the Access Assessment Test before a decision is made on whether or not to admit the applicant to the course