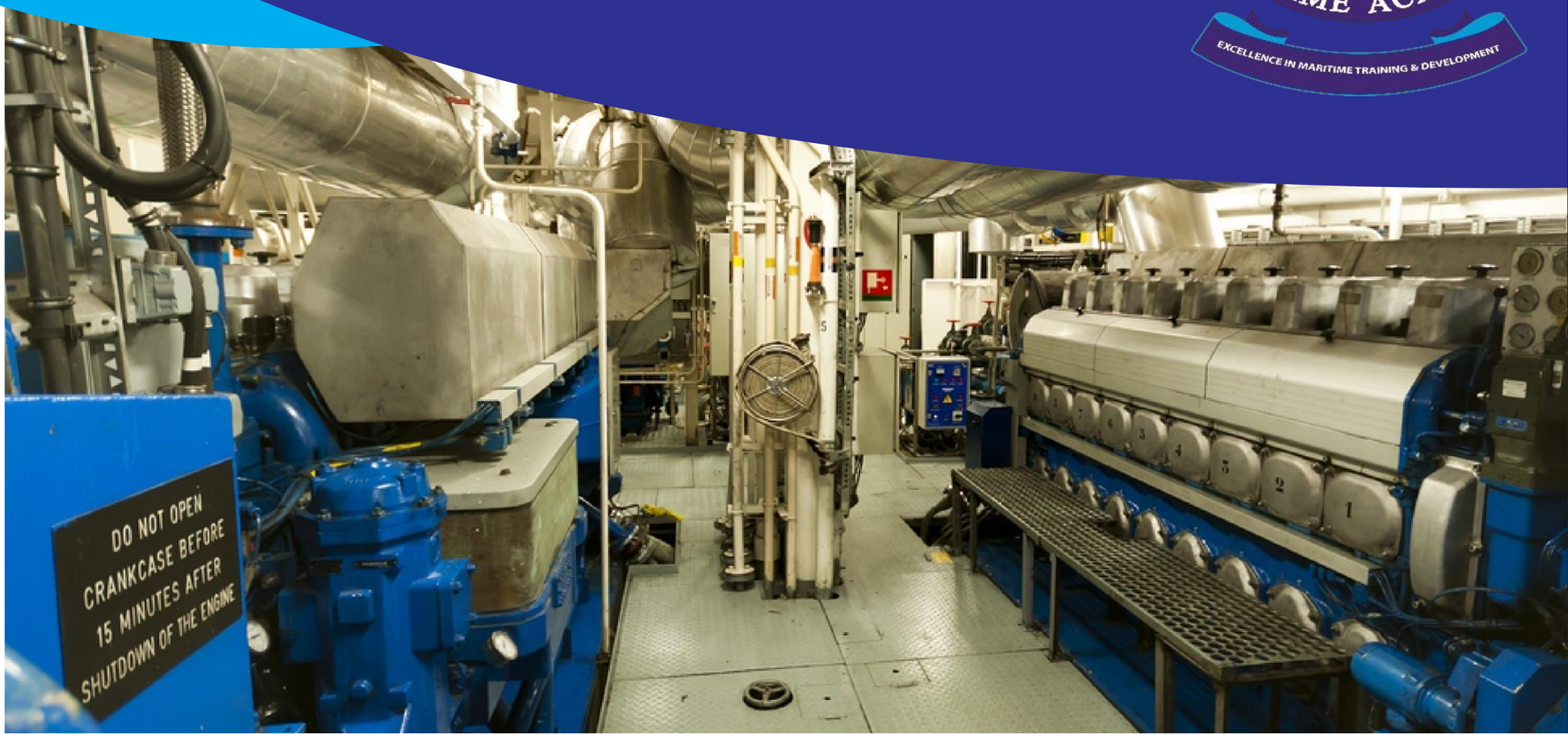
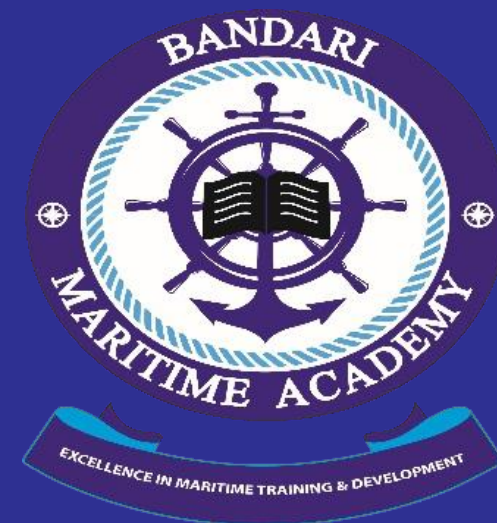


BANDARI MARITIME ACADEMY

CRAFT CERTIFICATE IN MARINE ENGINEERING

Workshop Skills Training Record Book



Vision Statement

World Class Centre for Maritime Education and Training

Mission Statement

To Provide Competent Maritime Human Resource for Sustainable Blue Economy

Core Values

The Values guiding the culture and conduct of the Academy in the discharge of its mandate include: -

a. Excellence:

The Academy is committed to delivering quality and exceptional services. The Academy strives to achieve constant adaptation, innovation and vigilance to deliver on its mandate;

b. Public Participation:

The Academy embraces the contribution of the public, partners and customers towards realization of its mandate. This is achieved through collaborations, partnerships and stakeholders' engagements.

c. Good Governance:

The Academy has established structures to effectively and efficiently manage its affairs and resources. The structures facilitate effective decision making process to enable the Academy deliver on its mandate. In addition, the Academy embraces the culture of integrity, transparency, accountability, equity and fairness.

d. Sustainable development:

The Academy shall continue to deliver on its mandate, having regard to efficiency and environmental integrity and being mindful of future generations.

e. National Ethos:

The Academy is guided by the seventeen (17) national values and principles of governance in accordance with Articles 10 and 232 of the Constitution of Kenya.

f. Team work:

The Academy inculcates the culture of working together and motivating each other so as to maximize every member's contribution to the team. The Academy takes full cognizance of everyone's ideas and expertise towards fulfillment of a common goal.

Introduction

This module unit is compulsory for all attachés undertaking technical training programs and is intended to equip the attachee with knowledge, skills and attitudes to enable him/her to perform duties in a real working environment. The rationale of the module unit is to:

- a) enhance the practical and communication skills/competences of attachees
- b) strengthen industrial/institution partnership
- c) provide a nation-wide mechanism to address key skill demand
- d) provide employers the opportunity to give back to society
- e) enhance training levels in acquired skills and competences
- f) provide a mechanism for academy to respond to identified areas of national key skill needs
- g) develop the manual skills of attachees associated with scientific and technological operations
- h) develop the attachees' personality and understanding of individuals and groups in work situations
- i) provide the attachee with background information and experience in career choice

Competence

The attachee should have the ability to;

- i) work effectively under supervision
- ii) apply knowledge and skills to solve problems
- iii) develop team work and organizational competences

General Objectives

By the end of the Industrial attachment period, the attachee should be able to:

- a) comprehend the constraints of working life and functional relationships within and between organizations
- b) recognize the importance of human relationships and work attitudes
- c) develop procedural knowledge towards work processes
- d) apply theoretical concepts and school based skills to practice
- e) develop work attitudes like curiousness, self-confidence, maturity and self-reliance
- f) obtain knowledge of potential careers and develop new areas of interest

The Industrial attachment scheme will enable academy to;

- a) establish link with industry for technical development, particularly in the area of product innovation, design and construction
- b) know skill gaps and improve quality of training
- c) obtain materials for teaching and case studies
- d) have a balance assessment of attachees

The industrial attachment scheme will enable employers to:

- a) understand future skills availability
- b) improve the training delivered at academy for industrial relevance
- c) influence the training of future generation of employees

Suggested roles of the academy, industry and attachees

It is the responsibility of the academy to:

- a) identify attachees who are qualified to go on attachment
- b) conduct an industrial attachment orientation and induction to attachees
- c) identify opportunities from the industry and match them with the number of attachees qualified to go on attachment
- d) prepare a code of conduct to be observed by attachees
- e) provide log books to attachees

It is the responsibility of the industry to:

- a) appoint an industry supervisor/mentor for the attachee
- b) carry out formal introduction/induction to the workplace by the industry supervisor/mentor
- c) design a weekly program of work for the intern to carry out whilst on attachment
- d) develop clear and well communicated expectations of the work program
- e) expose attachee to relevant activities and training opportunities
- f) supervise and assess progress of the attachee
- g) complete and release the log book of the attached attachee

It is the responsibility of the attached attachee to:

- a) read and observe the code of conduct applicable to the work place
- b) report to the academy any problems encountered
- c) fill the logbook daily to be completed and endorsed by both the industry and the academy supervisor

Instructions for the attachee on how to fill the logbook

- a) Each day, you should note in your logbook the work you have carried out. There are spaces for the dates and space where you should enter the numbers of the items in your industrial attachment training programme completed or partly completed during the period of your report.
- b) You may make sketches, any other exposure apart from the ones in the syllabus and additional comments to illustrate work carried out if you wish to, in the space provided at the back of each page.
- c) It is expected that your course instructor, supervisor or foreman will wish to see your logbook after you have recorded your weekly activities. You are advised to take the logbook to them to see and initial report in the space provided.
- d) Remember, this logbook is your property, and if you look after it, keep it clean, and complete it carefully and conscientiously it will form a valuable record of your training and may well assist you to obtaining employment in years to come.

(A) Attachee's Personal Details:

Last Name:Other Names:Gender:.....
Identity Card No.: Date of Birth: Date: Month: Year:
Course: Level: Year/ Module:
Home Address: Telephone:
Next of Kin (Name): Relationship:
Postal Address: Postal Code: Tel. No:

(B) Academy:

Name of Head of Academy:
Department:
School:
Head of School:Signature:Date:

(C) Details of Attachment Place:

Name of Organization:
Postal Address:Postal Code:
Tel:Mobile:..... Email address:.....
Industrial Attachment Supervisor (Name):
Position/ Designation:Signature:Date:.....

PERIOD	COMPITENCES	TASK COM PLETE D? (YES/ NO)	ATTACHEES REMARKS	SUPERVISOR'S REMARKS	SUPERVISORS SIGNATURE
			-Was the activity carried out? -Was it completed on time? -How difficult was it? - What are the learning experiences? - Challenges encountered?	- How did the attachee perform? - What was his/her attitude towards work? - Did attachee receive assistance to perform well?	
2 WEEKS	SHIP CONSTRUCTION				
	Ship Terms and Dimension				
	- Parts of a ship				
	- Terms related to ship orientation				
	Terms used for ship dimension and form				
	Ship Types				
	- Type of merchant ships				
	- Distinguishing features				

	- Ship categorization				
	Ship Building Materials				
	- Common types of ship construction materials				
	- Properties of materials				
	- Types of steel section				
	Ship Bottom Structure				
	- Types of Bottom structures				
	- Structural arrangement of ship bottom structure				
	- Framing system				
	- Additional strengthening				
	Bulkhead and Pillars				

	- Role of bulkheads and pillars				
	- Type of bulkheads				
	- Application of the different types of bulkheads				
	- Structural arrangement of bulkhead				
	- Construction of pillars				
	- Importance of watertight doors				
	Ship board pipelines				
	- Types of ship board pipeline systems				
	- Role of different types of ship board pipeline systems				
	- Layout of shipboard				

	pipeline system				
	Ship Stresses				
	- Ship stresses induced in a ship				
	- Effects of stress on a ship				
	- Structural features used to mitigate stresses				
	Load Lines and Draught Marks				
	- Deck Line markings				
	- Load Lines and loadline regulations				
	- Purpose of draughtmarks				
	Rudders and Propellers				
	- Propeller features				
	- Types of propeller				

	- Configuration of ship propellers				
	- Role of rudder in ship				
	- Principle of operation of rudder				
	- Constructional details of rudder				
	- Care of propeller				
	Hull Fittings and Accessories				
	- Structural arrangements of various hull fittings and accessories				
	- Components of deck cranes				
	- Features of a deck crane				
	Elementary Ship Yard Practice				
	- Loft work				
	- Welding				

2 WEEKS	- Plate preparation				
	- Plate thickness test				
	MARINE ELECTRICAL TECHNOLOGY				
	Electrical Materials				
	- Classes of electrical materials				
	- Applications of electrical materials				
	- Sheathing of marine cables				
	Electrical Tools				
	- Tools used in electrical and electronics trade				
	- Care and maintenance of tools				
	- Safe use of electrical and electronic tools				

	Electrical Measuring Instruments				
	- Types of electrical measurement instruments				
	- Taking and interpreting measurements				
	- Preparation and maintenance of instruments				
	Electrical Circuits				
	- Arrangement of electrical circuits				
	- Relationship between conductor physical dimension and its resistance				
	- Application of A.C. and D.C. power in a ship				

	Alternating Current				
	- Constructional arrangement of A.C. generator				
	- A.C. wave form				
	- Factors that affect frequency of alternating current				
	- A.C. circuit comprising different types of electrical loads				
	Work, Energy and Power				
	- Measurement of energy and power				
	- Calculation of work, Energy and power				
	- Verification of power equation.				

	Lighting				
	- Construction and operation of electrical lamps				
	- Shipboard applications for electrical lamps				
	- Lighting installation				
	- Factors to consider when selecting a suitable lamp				
	Electrical Machines				
	- Categories of motors				
	- Constructional arrangement of different types of A.C. motors				
	- Constructional parts of D.C motors				

	Batteries				
	- Demonstrate safety measures and first aid when dealing with batteries				
	- Construction of batteries used on board ships				
	- Main and emergency services				
	- Elements of battery maintenance				
	- Demonstrate battery connection.				
	Semiconductor Theory				
	- Biasing of p-n junction diode				

	Diodes and Transistors				
	- Identifying types of diodes and transistors				
	- operation of a transistor				
	- application of diode and transistor				
	Electronic Circuit				
	- Soldering with pot and ladle				
	- Soldering using electric soldering iron				
	- Soldering bits				
	- Soldering using blow lamp				
	Thermistors				
	- Types of thyristors				
	- Applications of thyristors				

	- Constructing simple thyristors circuit				
	Integrated Circuit and Large Scale Integrated Circuit				
	- Integrated Circuit (IC) and Large Scale Integrated Circuit (LSIC)				
	- Structure and the operation of various types of ICs and a LSIC				
	- Functions of various types of ICs and LSICs in circuits				
	WORKSHOP TECHNOLOGY AND PRACTICE				
	Engineering Materials				
	- Types of Engineering materials				

4 WEEKS	- Mechanical properties of engineering materials				
	- Physical properties of engineering materials				
	Measuring Instruments and Equipment				
	- Uses of Measuring equipment				
	- Selection criteria				
	- Care of measuring instruments				
	Marking Out				
	- Marking out tools				
	- Marking out procedure				

	Bench work and Fitting				
	- Hand tools				
	- Selection criteria				
	- Bench work and fitting operations				
	Material Joining				
	- Manual arc welding				
	- Oxy-acetylene welding				
	- Soldering				
	Carpentry and Joinery				
	- Materials used in carpentry and joinery work				
	- Tools and equipment used in carpentry				
	- Types of joint				

	- Wood working processes				
	- Wood finishing materials				
	- Application of carpentry and joinery in marine engineering				
	Steel and Metal Forming Processes				
	- Material forming processes				
	- Heat treatment process				
	Mechanical Fasteners				
	- Types of mechanical fasteners				
	- thread profile				
	- Types of thread				
	- Types of rivets				
	- Riveting procedure				

	Pipe and Pipework				
	- Fittings				
	- Pipe joining methods				
	- Sealants				
	- Pipe bending procedure Pipe threading				
	Grinding Machine				
	- Bench grinder components				
	- Grinding operation				
	Drilling Machine				
	- Drilling machine components				
	- Drilling machine operation				

	Centre lathe machine				
	- Centre lathe machine components				
	- Centre lathe machine operation				
	Shaping machine				
	- Shaping machine components				
	- Shaping machine operations				
	Milling machine				
	- Milling machine components				
	- Milling machine operations				
	Corrosion Prevention and Finishing Processes				

4 WEEKS	- Causes of corrosion and its prevention				
	- Paints				
	- Surface preparation				
	- Paints sequence				
	- Methods of application of varnishes				
	- Surface finishing process				
	MARINE ENGINEERING KNOWLEDGE				
	Fire and safety				
	- Maintenance of hoses, nozzles and couplings				
	- Check firefighting equipment's				
	- Hold fire and abandon ship drills				
	- Use of mechanical				

	resuscitation operators				
	- Testing of the fire detection and alarm systems				
	Safe Working Practices				
	- Performing enclosed space drills				
	- Demonstrating hot work and working aloft safety procedures				
	Marine Pumps				
	- Observe safety precautions while working on pumps and piping systems				
	- Diagnosing common pump faults				
	- Maintain various types of pumps				

	- Pump operation				
	Fluid Flow and Pumping Systems				
	- Types of valves used in pumping systems				
	- Factors affecting efficiency of pumps				
	- Typical pumping systems of a ship				
	- Safety features				
	- Maintenance procedures				
	Internal combustion engines				
	- Internal combustion engine operating principle				
	- Valve Timing diagram				
	- Effects of valve timing on				

	engine performance				
	- Service and maintenance				
	Engine components				
	- Identifying engine components				
	- Principal engine parts				
	- Comparison for construction of crosshead and trunk engine Service and maintenance				
	- Standard procedures used to service and maintain an engine				
	Deck Machinery				
	- Functions of ship's deck machinery				

	- Constructional features of deck machinery				
	- Operating mechanisms of deck machinery				
	- Maintenance of deck machineries				
	- Protection from corrosion				
	Engineering Watch keeping Rules				
	- Modes of communication in the engine room				
	- Engine room layout				
	- Functions of engine room machinery				
	- Engine room alarms				
	- Watch keeping procedures				
	- Environmental protection procedures				

	Marine Diesel Engines				
	- Identification of different types of engine configuration				
	- Dismantling and inspection of marine engine				
	- Assembly of engine components				
	- Sketching the trunk and crosshead engine				
	Engine Performance				
	- Typical indicator diagram				
	- Problems associated with taking engine				

	performance measurement				
	- Factors that affect engine performance				
	Engine PowerTransmission				
	- Components associated with engine power transmission				
	- Working principle of components associated with engine power transmission				
	- Diesel electric transmission systems				
	- Standard procedures for inspection, maintenance				
	- Dismantling and assembling of engine power				

	transmission system				
	Engine Systems				
	- Layout of fuel oil system				
	- Fuel injection systems				
	- Layout and working principle of lubricating oil system				
	- Engine cooling systems				
	- Air starting systems				
	Engine repair and maintenance				
	- Engine repair and maintenance requirements				
	- Engine measurements				
	- Engine overhaul, repair and maintenance				

	- Cylinder re-boring, honing and deglazing process				
	- Crankshaft grinding				
	- Locking and sealing devices				
	Auxiliary Machinery				
	- Auxiliary machinery of a ship				
	- Functions of auxiliary machinery				
	- Safety operational Procedures				
	Fuel Technology				
	- Interpreting fuel oil properties data				
	- Fuel purification and treatment				

	<ul style="list-style-type: none">- Determining the quantity of fuel oil onboard ship tank that is ullage and sounding				
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ADDITIONAL REMARKS

Students Name: Signature:Date:.....

Supervisor's Name: Signature:Date:.....



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