BANDARI MARITIME ACADEMY

CRAFT CERTIFICATE IN NAUTICAL SCIENCE

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 fulfilment of a common goal.

Introduction

This module unit is compulsory for all attaches undertaking technical training programs and is intended to equip the Attachee with knowledge, skills and attitude 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 training institutions 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 attached with background information and experience in career choice.

Competence

The attached 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 attached 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 the Academy to;

a) establish links 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 balanced assessment of attachees.

The industrial attachment scheme will enable employers to:

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

Suggested roles of the training institution, 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 attaches
e) provide logbooks to attaches.

It is the responsibility of the industry to:

a) appoint an industry supervisor/mentor for the attached
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 attached to relevant activities and training opportunities
f) supervise and assess progress of the attached
g) complete and release the log book of the attached.

It is the responsibility of the attachee to:

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

Instructions for the attached 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 Title: …… 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……..

CRAFT CERTIFICATE IN NAUTICAL SCIENCE					
PERIOD	COMPETENCES	TASK COMPLETED? (YES /NO)	ATTACHEES REMARKS -Was the activity carried out? -Was it completed on time? -How difficult was it? - What are the learning experiences? - Challenges encountered?	SUPERVISOR, S REMARKS - How did the attached perform? - What was his/her attitude towards work? - Did attached receive assistance to perform well?	SUPERVISORS SIGNATURE
1.0 1ST WEEK	SEAMANSHIP				
	Occupational Health and Safety Procedures				
	- Shipboard safety				
	- OHS records				
	Introduction to Seamanship				
	- Types of ships				
	- Types of ships				
	- Parts of a ship				
	- Load-line marks				
	Rope work, Riggings and Towing Arrangements				
	- Types of ropes				
	- Types of riggings				
	- Care of ropes				

	- Tools used in rope work				
	- Riggings and deck gear				
	- Rigging safety				
	- Safety and inspection procedures				
	- Towing equipment used onboard a ship				
	- Preparation for towing forward and aft towing				
	- Precautions observed while towing				
	Anchors and Cables				
	- Types of anchors				
	- Marking on anchors				
	- Parts of the anchors and anchor cables				

	- Maintenance of anchors and anchor cables				
	- Anchoring procedures				
	- Fouled anchor				
	- Securing and storage of anchor				
	- Procedures for “Let go”				
	Mooring and Berthing Operations				
	- Making fast and letting go				
	- Use of anchors in various operations				
	- Types of moors				
	- Different types of Berths				
	- Berthing procedures				
	- Procedures for making fast				
	- Types of winches				

	- Winch operation				
	- Signals				
	- Winch maintenance				
	- Precautions to take when operating a winch				
	Life Boats and Survival Crafts				
	- General construction requirements				
	- Difference between life boat and life raft				
	- Standard lifeboat and life raft equipment's				
	- Types of life boats				
	- Launching mechanisms				
	- life-saving and survival equipment				

	Shipboard Maintenance				
	- Deterioration of vessel's deck				
	- Types of paints				
	- Types of lubricants				
	- Cleaning materials				
	- Routine maintenance				
	- Surface Preparation				
	- Manufacturers safety guidelines				
	- Disposal of waste				
2.0 2ND WEEK	Emergencies				
	- Emergencies onboard ship				
	- Procedure of rescuing survivors				
	- Emergency Position				

	Indicating Radio Beacon (EPIRB)				
	- Search and Rescue Radar Transponder (SART)				
	- Types of pyrotechnics				
	Safe Navigational Watch and Steering				
	- Compass reading and reporting				
	- Conning orders				
	- Change over steering				
	- Terms used in compass work				
	- Compass errors				
	BOAT HANDLING PRACTICES				
	Marine Environment Protection				
	- Preventing pollution				

	- Operation of anti-pollution equipment				
	- Disposal of marine pollutants				
	- Disposal of marine pollutants				
	- Implementation of garbage disposal onboard				
	- prevent operational pollution by garbage				
	- Report on garbage segregation and disposal				
	- Garbage disposal procedures				
	- Garbage segregation				
	- Record garbage segregation				
	Basic Meteorology and Tidal Knowledge				

	- Sources of weather reports				
	- Sources of tidal information				
	Basic Navigational Skills				
	- Chart symbols				
	- Coastal features				
	- Dangers to navigation				
	- Passage planning				
	- Obtaining a position				
	- Navigational aids				
	- Aids to navigation				
	Short Range Communication				
	- Types of communication of maritime mobile services				
	- Purpose and use of Digital Selective Calling				

	- Call categorization and prioritization				
	- Alerting and locating signals				
	- National and International regulations on use of maritime communication				
3.0 3RD WEEK	Boat work and Steering				
	- Parts of a boat				
	- Building materials				
	- Advantages and disadvantages of different boat building materials				
	- Boat fittings				
	- Care and maintenance of boats				
	- Factors considered in boat handling				

	- Boat handling operations				
	Basic Marine Engine Technology				
	- Routine checks				
	- Safe operation of propelling and ancillary equipment				
	- Water cooling and bilge pumping arrangements				
	- Low voltage electrical systems				
	- Fire prevention and explosion prevention				
	- Refueling				
	Boat Handling Practices				
	- Towing arrangement				
	- Beaching				

	GENERAL MARINE ENGINEERING KNOWLEDGE				
	Boiler				
	- Types of marine boilers				
	- Boiler systems				
	- Boiler checks while running				
	- Safety precautions for a Boiler				
	- Boiler accessories and steam distribution system fittings				
	Steering gear				
	- Steering gear components				

	- Emergency steering procedures				
	- Steering gear checks				
	Incinerator				
	- Purpose of incinerator				
	- Components of an Incinerator				
	- Incinerator checks while running				
4.0 4TH WEEK	Oily Water Separator (OWS)				
	- Functions of an OWS				
	- Components of an Oily Water Separator (OWS)				
	- Regulations governing operation of OWS				

	- OWS running checks				
	Sewage treatment plant				
	- Purpose of sewage treatment plant				
	- Functions of a sewage treatment plant				
	- Components of sewage treatment plant				
	- Regulations				
	- Sewage treatment plant running checks				
	Heaters				
	- Types of heaters				
	- Constructional details of heaters				
	- Maintenance procedures				

	Coolers				
	- Types of coolers				
	- Function of coolers				
	- Construction components				
	- Maintenance procedures				
	Purifiers				
	- Purpose and constructional details of a purifier				
	- Purifier checks while running				
	- Purifier room safety precautions				
	Air compressors				
	- Function of an air compressor				

	- Air compressor checks while running				
	- Safety precautions				
5.0 5TH WEEK	Pumps				
	- Types of pumps				
	- Procedure for starting a pump				
	- Pumps checks while running				
	- Safety precautions				
	Air Conditioning System				
	- Air conditioning system components				
	- Checks while running				
	Ship's Refrigeration systems				

	- Purpose of provision refrigeration system.				
	- Provision refrigeration system checks while running				
	Batteries				
	- Categorization				
	- Construction				
	- Principle of operation				
	- Maintenance procedure and test				
	- Series and parallel connection				
	- Shipboard application				
	Internal Combustion Engines				
	- Classification of internal				

	combustion engines				
	- Internal combustion engine constructional components				
	- Working Principles of internal combustion engines				
	- Fuel oil systems				
	- Propulsion engine cooling system				
	- Engine air starting system				
	- Engine lubrication oil systems				
	- Engine safety system				
	- Engine checks				

	- Procedures for starting and stopping engines				
	Petrol and diesel engine for small vessel				
	- Working principles of four stroke engines				
	- Valve timing for four stroke cycle engines				
	- Fuel systems for high speed four stroke engines				
	- Cooling systems				
	- Lubrication systems				
6.0 6TH WEEK	Internal combustion engine repair and maintenance				
	- Safe Procedures for overhauling internal combustion engine				

	- Main propulsion and auxiliary engine periodically overhauled components				
	- Petrol and diesel engine for small vessels maintenance				
	- Temporary engine repair measurements				
	- Locking and sealing devices				
	Basic Electrical Knowledge				
	- Terms				
	- Arrangement of shipboard electrical systems				
	- Functions of shipboard electrical systems components				
	- Ship's electrical safety precautions				

	- Electrical testing equipment				
	- Electrical equipment				
	RULES OF THE ROAD (ROR)				
	Lights and Shapes				
	- Application				
	- Definitions				
	- Visibility of lights				
	- Power driven vessels underway				
	- Towing and pushing				
	- Sailing vessels underway and vessels under Oars				
	- Fishing vessels				

	- Vessels Not Under Command or Restricted in their ability to Manoeuver				
	- Vessels constrained by their Draught				
	- Pilot Vessels				
	- Anchored vessels and vessels aground				
	- Seaplanes				
	Sound and Light Signals				
	- Definitions				
	- Equipment for Sound Signals				
	- Maneuvering and warning signals				

	- Sound signals in restricted visibility				
	- Signals to attract attention				
	- Distress signals				
	SHIP CONSTRUCTION				
	Ship Stresses				
	- Structural features used to mitigate stresses				
	Load Lines and Draught Marks				
	- Deck Line markings				
	- Load Lines and load line regulations -				
	- Purpose of draught reading				
7.0 7TH WEEK	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				
	- Description of hull fittings and accessories				
	- Structural arrangements of various hull fittings and accessories				
	- Components of deck cranes				

	- Features				
	- Operating principle				
	Elementary Ship Yard Practice				
	- Shipyard layout				
	- Shipyard drawing				
	- Elementary ship yard practice				
	- Plate, section preparation and machining				
	- Frame bending				
	- Launching of ships				
	- Dry docks				
	- Dry docking procedure				

	CARGO HANDLING AND STORAGE				
	Draught, trim and stability				
	- Identifying Load line mark				
	- Initial GM for a cargo ship				
	- Ship's hydrostatic particulars				
	- Deadweight scale				
	Cargo Handling Safety				
	- Visual inspection of all cargo gear				
	- Cargo gear test certificates and registration				
	- Safe working load				
	- Certificate of properties for				

	ropes and wires				
	- Inspection requirements				
	- Replacing cargo runner				
	- Working with hatch covers				
	- Safe working practices				
	- Potentially dangerous spaces				
	- Entering enclosed spaces				
	- Definition of terms				
	- Safe working practices				
8.0 8TH WEEK	Securing cargoes				

	- Solid stow and securing of all cargoes				
	- Stowing of cargo liable to sliding				
	- Cargo stowage methods				
	- Securing cargo spaces				
	- Securing heavy loads				
	- Stowing and securing vehicles and trailers				
	- Cargo securing manual				
	- Passenger operations				
	- Precautions for heavy lift				

	Deck cargo				
	- Cargo commonly carried on deck other than container cargo				
	- Stowage of deck cargo				
	- Spreading effects of a concentrated load over a wider area				
	- Effect of deck cargo on stability				
	- IMO Code of safe practice for ships carrying timber deck cargoes				
	- Guard lines or rails				
	- Access provisions between the				

	deck and the top of the stow				
	- Stowage and securing of containers on deck				
	- Loading/discharging of RO-RO cargoes				
	Container cargo				
	- Arrangement of a container ship				
	- Position of a particular container				
	- Sequence of operations at a terminal				
	- Planning a container stow				
	- Securing containers on deck				
	- Types and sizes of container				

	Bulk cargo (other than grain)				
	- Definition of terms				
	- IMBSC Code				
	- Preparation of cargo holds				
	- Separation between certain bulk cargoes				
	- Hazards of solid cargoes				
	- Entry into cargo holds				
	- Hazards associated with coal cargoes				
	- Monitoring the temperature of the holds				

	- Precautions to take during loading and discharging coal				
	- Ventilation of coal cargo				
	Bulk grain cargo				
	- Definition of terms				
	- Cleaning and preparation of holds and decks				
	- Insect or rodent infestation				
	- Dangers associated with using insecticide in cargo holds				
	- Importance of trimming				

	- Fitting of shifting boards				
	- Reduction of heeling moments resulting from a shift of grain				
	- Securing the surface of a partly filled compartment				
	- Separation of two different bulk grain cargoes loaded into the same compartment				
	Cargo care				
	- Inspection and preparation of holds				
	- Segregation and separation of cargoes				
	- Ventilation and control				

	- Refrigerated cargo				
9.0 9TH WEEK	Dangerous, hazardous and harmful cargoes				
	- Different types of containment				
	- Classification of IMDG Code				
	- Substances, materials and articles covered by the 9 classes of the IMDG Code				
	- Information on dangerous goods				
	- Handling dangerous goods				
	- Damage and defects				
	- Packing requirements				

	- Fire precautions when carrying dangerous goods				
	- Precautions while loading or discharging explosives				
	Cargo Handling Equipment				
	- Care and maintenance of riggings and fittings				
	- Rigging of derricks				
	- Setting up guys and preventers				
	- Limitations and effect of angles between runners				
	- Changing the rig from single runners to gun tackles				

	- Topping and lowering derricks safely				
	- Securing derricks for sea				
	- Use of slings and hooks				
	- Lifting bales				
	- Handling of common unitized and pre-slung loads				
	- Cranes and derricks				
	- Fork-lift trucks use in the 'tween-decks or holds				
	Oil tanker piping and plumbing arrangements				
	- General tanker arrangement for crude carriers and				

	product tankers				
	- Cargo piping system				
	- Cargo pumps				
	Cargo Calculations and Cargo Plans				
	- Definition of terms				
	- Bale capacity and grain capacity				
	- Allowance for broken stowage				
	- Tank calibration tables				
	Cargo spaces, Hatch covers and Ballast tanks				
	- General layout of cargo space				

	- Cargo space inspection				
	- Hatch covers inspection				
	- Ballast tanks inspection				
	- Preparation of a damage report				
	- Enhanced survey programme				
	METEOROLOGY				
	Shipborne Meteorological Instruments				
	- Meteorological instruments onboard a ship				
	- Aneroid barometer				
	- The function of a hygrometer				

	- Principle of wind sensors				
10.0 10TH WEEK	Wind and Atmospheric Pressure				
	- Beaufort scale of wind force				
	- Methods of estimating the strength of the wind				
	- Methods of estimating the wind direction				
	Weather Services for Shipping				
	- World meteorological organization				
	- Sources of weather information available to shipping				
	- Information flow between merchant ships and				

	meteorological offices				
	- Services provided for shipping by meteorological offices				
	- Weather bulletin				
	- Information received by facsimile machine				
	- Storm warnings				
	Recording and Reporting Weather Systems				
	- 'Ship Code and Decode Book'				
	- Coding process				
	- Decoding process				

	- Improved weather forecast				
	Application of Meteorological Information				
	- Weather charts				
	- Symbols and patterns in a weather chart				
	- Forecasting				
	- Evaluation of a forecast				
	WATCH KEEPING PRACTICES				
	Keeping a Safe Navigational Watch				
	- Principles of watch keeping				
	- Operational guidance for officers in charge of a navigational watch				

	- Log book entries				
	Keeping an effective deck watch in port under normal circumstances				
	- Arrangements for keeping watch in port				
	- Matters on which the relieving officer should satisfy themselves before assuming charge of the watch				
	- Keeping a deck watch in port				
	- Actions on receiving a storm warning or in an emergency				
	- Log book entries				

11.0 11TH WEEK	Keeping a Safe Deck Watch in Port when carrying Hazardous Cargo Operations				
	- Hazardous cargo				
	- Personnel requirements when carrying hazardous cargo in bulk				
	- Requirements for special types of ships or cargo				
	- Officer of the watch responsibility				
	- Action in the event of a spillage or fire				
	- Entry into enclosed spaces				
	- Rescue from an enclosed space in an emergency				
	Bridge Resource Management				

	- Information exchange with pilot				
	- Importance of challenge and response				
	- Appropriate response to various challenges and situations				
	Weather Routing				
	- Basic routines of weather routing				
	- Climatological information from routing charts				
	- Use of meteorological forecasts and synoptic and forecast charts to modify the route plan				
	- Meteorological information available to				

	personnel ashore				
	- Meteorological information onboard available to the Master				
	- Weather messages received from the routing services				
	Visual Pilotage and Blind Pilotage Techniques				
	- Pilotage definition				
	- Pilotage regulations				
	- Items for visual pilotage planning				
	- Items for blind pilotage planning				
	- Route Planning and ETA/ETD				

	- Limiting danger line				
	- Planning appraisal, track selection and other factors				
	- Methods of track control				
	- Use of edges of land as head marks/stern marks				
	- 'No headmark' procedure				
	- Altering course and monitoring terms				
	- Allowing for a current/tidal stream/leeway when altering course				
	- Monitoring turns				
	- Keeping clear of dangers				

	- Blind pilotage preparation and executing techniques				
	Automatic Radar Plotting Aids (ARPA)				
	- Principle of ARPA				
	- ARPA display characteristics				
	- Performance standards				
	- Over reliance on ARPA				
	- Methods of target acquisition				
	TERRESTRIAL AND COASTAL NAVIGATION				
	Charts, Paper and Electronic				
	- Natural scale of a chart				
	- Chart projections				

	- Marine navigation charts				
	- Mercator chart				
	- Properties of the chart				
	- Chart correction				
	- Terms used in ECDIS				
	- ECDIS carriage requirements				
	- Difference between vector and raster electronic charts				
	- ECDIS and ECS data				
	- Scope and selection of chart data display categories				
12.0 12TH WEEK	Magnetic Compass, Compass Errors and Deviation				

	- Earth' magnetic field				
	- Magnetic Meridian				
	- True north				
	- Magnetic North				
	- Magnetic Variation				
	- Magnetic Deviation				
	- Compass North				
	- Swinging ship				
	- Compass error				
	Gyro Compass				
	- Gyro compass input to navigational equipment				
	- Sources of gyro compass errors				

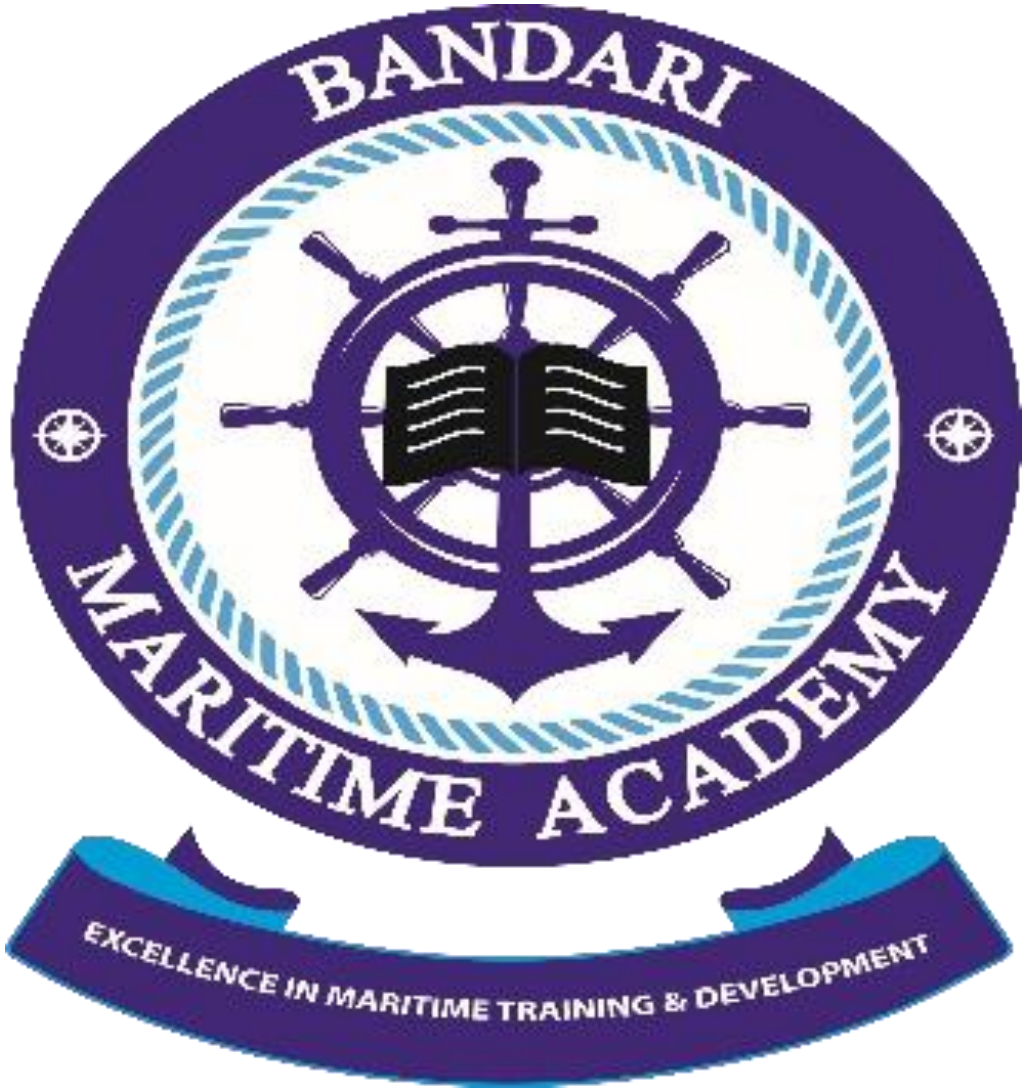
	- Maintenance of Gyro compass				
	- Gyro error				
	Position Lines and Positions				
	- Definition of terms				
	- Simultaneous cross bearings				
	Sailings				
	- Definition of terms				
	- Mean latitude				
	- Departure and difference of longitude				
	- Mercator sailing formula				
	- Transverse table				
	- Great circle sailing				

	Tides				
	- Theory of tides				
	- Definition of terms				
	- Use of tables to determine height of tides				
	Keeping of Logs				
	- Rules, regulations and common practice				
	- Procedure of keeping of logs				

ADDITIONAL REMARKS

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

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



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