

## Sea Training Institute

### Arab Academy For Science and Technology & Maritime Transport

Sea training has been undertaken in Egypt since the establishment of the Arab Academy for Science, Technology and Maritime Transport in 1974. It has always been a vital stage in forming the future officers not only in the area concerning Maritime Education and Training, but also in forming the unique characteristics of marine officers, such as self-developmental education, responsibility, attentiveness, planning, readiness, spontaneity, accuracy, self-denial, obedience, leadership, etc.

AASTMT recognized the importance of these aspects from the beginning of its establishment by training the cadets on the training vessel "AIDA III" and by adopting a guided sea training program in 1983 beside the existing planned sea training program. Then it has taken major steps towards this important part by forming a specialized institute for sea training and by concluding an agreement with Japan International Co-operation Agency (JICA), by which it has donated AASTMT one of the modern specialized training ships "AIDA 4" in February, 1992.

## Objectives

An integral part of the programs for Sea Training is the practical knowledge that students gain by actual work experience. A major component of the programs for Sea Training is learning by doing.

The cadet has the ability to provide a lot of experience in the shortest possible time; the cadets are required to learn fast and across a wide syllabus. They may have accumulated theoretical knowledge in the basic studies in the first four academic semesters, but this will be their first opportunity to see the same worked out in practice and applied to the reality of ship's operations.

## Activities

The training ship 'Aida IV' is a sailing school of navigation. At sea, the lecturers teach coastal and celestial navigation, meteorology, regulations for preventing collisions at sea, practical seamanship, watch duty, ship technology, engine theory, etc. The cadets are trained in important aspects such as apprentice training, maritime safety, first-aid, and fire fighting. When the training ship 'Aida IV' is at sea, you have a 10 to 12 hours' working day distributed on watch duty and on deck training. The cadets will follow a set training syllabus designed to provide them with the necessary experience, and to give them the opportunity to participate in everything that is done aboard ship.



## Job Opportunities

Marine training is carried out onboard AASTMT training ship AIDA IV which was built in Japan. This highly sophisticated training ship is fully equipped and was designed to develop trainees' skills and trends, in order to enable them to work as marine deck and engineering officers in accordance with the latest international standards set for sea.



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## Program of Study for Nautical Department Cadets during the Fifth Semester & sixth Semester Guided Sea Training Onboard Training Ship AIDA IV & other equivalent ships

### Aim of 5th Semester

This training provides the practical shipboard experience required to become an efficient and competent ship's officer. It supplements and reinforces the classroom learning undertaken to meet the requirements of regulation II/4 of the 1995 STCW and amendments in Manila 2010 Convention for theoretical and practical knowledge. Practical Watchkeeping experience is based on regulation II/1, "Basic Principles to be observed in keeping a Navigational Watch", and Resolutions 1&3 adopted by the international Conference on Training and Certification of Seafarers, 1978.

### Course Objectives of 5th Semester

The Trainees will acquire basic seamanship skills and a practical awareness of the need to follow safe working practices. They will also be able to keep a safe navigational watch in accordance with the relevant regulations and recommendations.

### Syllabus of 5th Semester

#### Practical Seamanship

- oo Visiting bridge, lookout post, fore-castle poop deck, main deck and other work areas
- oo Getting acquainted with steering controls, telephones, Eng. Telegraph/s & other bridge equipment and displays
- oo Demonstrating proper mooring procedures
- oo Runs, heaves, stoppers and turns up mooring lines.
- oo Operating mooring winches, windlass and capstans.
- oo Supervising the stowage of mooring ropes and wires
- oo The procedure for handling garbage, rubbish and other wastes
- oo The use of garbage compactor or other equipment as appropriate
- oo Demonstrating proper anchoring procedures
- oo Preparation of anchor for letting go & securing for sea
- oo Applying the international regulations for preventing collisions at sea
- oo Load line & Read Draft
- oo Preparing steel surface for re-coating
- oo Painting surfaces.
- oo Operating deck winches and cranes under supervision
- oo Propellers and Maneuvering
- oo Pilot Ladder
- oo Maneuver to rescue person overboard



## Practical Marine Safety

- oo Communicating with other persons on board on Elementary safety matters
- oo Understanding safety information symbols, signs and alarm signals
- oo Locating and don lifejackets
- oo Knowing what to do if a person falls overboard
- oo Identifying muster and embarkation stations and emergency escape routes
- oo Knowing what to do if fire or smoke is detected
- oo Knowing what to do if the fire or abandon ship alarm is sounded
- oo Locating and explaining how to operate emergency deck stop mechanism for main engines, including other emergency stop valves
- oo Locating CO2 bottle room
- oo Locating and explaining the operation of emergency pump
- oo Locating medical and first aid equipment
- oo Taking immediate action upon encountering an accident or other medical emergency before seeking further medical assistance on board
- oo Basic knowledge of the use of portable fire extinguishers
- oo Demonstrate ability to organize and supervise the launching, handling, and recovery of lifeboat
- oo Organizing abandon ship drills
- oo Determining cause of fire onboard and preventing fire onboard



## Practical Watch keeping

On preparing for sea, check ship's draught, and check that the necessary equipment on bridge are operational and proper sailing information are available

- oo Pre-Arrival Check list.
- oo At the commencement of the watch, ascertain ship's position, course and speed and appraise the traffic situation and any danger to the ship.
- oo The navigational duties of the officer of the watch when pilot is embarked.
- oo The circumstances in which the officer of the watch should notify the master.
- oo The recommended procedures on encountering restricted visibility.
- oo Respond to emergencies.
- oo Deck officer watch in port.

## Ship Stability and General Cargo

- oo General preparation of holds
- oo Separation of cargo
- oo Calculating the capacity of spaces available for cargo
- oo Cleaning bilges, wells and strum boxes
- oo Preparing and interpreting cargo plans
- oo Describing a stable ship, an unstable ship, a ship in neutral condition
- oo Describing a tender ship and a stiff ship
- oo The effect of change in density on the ship's draft
- oo Calculating cargo loaded, stability and loading stresses

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## Communication

- oo Use IMO standard Marine Communication phrases
- oo Transmit and receive Morse signals by light
- oo Use the international code of signals to interpret messages given by flags and pendants

## Medical First Aid

- oo Take immediate action upon encountering an accident or other medical emergency before seeking further medical assistance on board
- oo Stop excessive bleeding, ensure breathing and put injured persons in the proper position
- oo Detect signs of shock and heat stroke and act accordingly
- oo Treat burns, scalds, fractures and hypothermia

## Pollution

- oo Ensure that procedures are agreed and observed and all scuppers are blocked before bunkering
- oo Initiate immediate investigation to detect the source of pollution
- oo Stop or prevent leakage and spills of harmful liquids and solid substances
- oo Carry out bilge, ballast and bunkering operations

## Practical Navigation

- oo Select charts with adequate scale
- oo Consult nautical publications
- oo Checks with notices to mariners for latest correction to chart
- oo Chart correction.
- oo Determine and apply compass error for courses and compass bearings
- oo Recognize conspicuous objects and other terrestrial aids to navigation in day light and at night
- oo Establish position by terrestrial observations, i.e., lighthouses, buoys and beacons
- oo Set courses
- oo Calculate Estimated Time of Arrival (ETA)
- oo Calculate height of tide at a given time, and calculate the time of a given height.
- oo Use Tide tables to find the time of high and low water in standard ports
- oo Parallel Sailing
- oo Plan sailing
- oo Mercator Sailing
- oo Able to use and interpret information obtained from ship-borne meteorological instruments
- oo Practice using sextant, checks for errors and make the necessary adjustments
- oo Obtain position line from observation of the sun, star & planet and Moon
- oo Calculate the Time of sunrise & sunset
- oo Meridian Passage
- oo Preparation of star
- oo Simultaneous shot
- oo Sun Run Sun



## Practical Electronic Navigation System

- oo Radar Plotting
- oo Operate electronic position fixing and navigational equipment (G.P.S.)
- oo Doppler speed log
- oo Echo sounder



## Aim of 6th Semester

To be ready to sit for Second Mate Exam.

To be able to serve as Officer in Charge of a Navigational Watch.

Maintaining direct control over the performance of all functions within the designate area of responsibility in accordance with proper procedures.

## Objectives of 6th Semester

On completion of the course, the student will be able to sit for Second Mate Exam.

On completion of the course, trainees will have a Knowledge of Cargo Handling and Stowage, Ship Stability, Watch keeping, Ship Maneuvering and Emergency Procedures.

## Syllabus of 6th Semester

### Emergency Procedures Onboard Ship

- oo Organize Muster List.
- oo Organize abandon ship drills.
- oo Boat Drill.
- oo Demonstrate ability to organize and supervise the launching, handling, and recovery of life boat.
- oo Fire Drill.
- oo Demonstrate ability to act in accordance with the fire-fighting plan during fire-drills.
- oo Close and open the fire, weather-tight and water-tight doors fitted in the particular ship other than those of hull openings.
- oo Enter an Enclosed Space during relevant drills and

carry out rescue operations wearing breathing apparatus.

- oo Pollution drills (Initiate immediate investigation to detect the source of pollution).
- oo Pollution drills (Stop or prevent leakage and spills of harmful liquids and solid substances).

### Maneuver the Ship

- oo Ship handling terms and general definitions
- oo Factors in ship handling
- oo Turning circle and stopping distance
- oo The effect of deadweight draught, trim, speed and under-keel clearance on turning circles and stopping distances
- oo The effect of wind and current on ship handling
- oo The effect of squat shallow water and similar effects

### Respond to Emergency

- oo The initial actions following Engine room failure
- oo The initial actions following Steering gear failure (or loss of rudder)
- oo The initial actions following a collision
- oo The initial actions following flooding
- oo The initial actions following stranding
- oo The initial actions following beaching
- oo The initial actions following grounding
- oo The precaution for the protection and safety of passengers and crew in emergency situations (Abandonment from the vessel)
- oo Rescuing persons from the sea and assisting a ship in distress

### Practical Navigation

- oo Observation of Polaris
- oo Observation of the Sun & Star & Moon and plant by Longitude Method
- oo Calculate the Time of Moonrise & Moonset.
- oo Navigation Reliability.
- oo Sun Run Meridian.
- oo Meridian Run Sun
- oo Ex-Meridian.
- oo Calculate height of tide at a given time, and calculate the time of a given height at Secondary Ports.
- oo Coastal Navigation (wind and current)
- oo Great Circle Sailing.

### Plan a Passage

- oo Pilot books
- oo Lists of lights
- oo Chart catalogue
- oo Chart 5011
- oo Mariner's handbook & ocean passage.
- oo Checks with notices to mariners for latest correction to chart
- oo Chart correction
- oo List of radio signals
- oo Select charts with adequate scale
- oo Consult nautical publications (weather routing chart)
- oo Consult nautical publications (plotting sheets)
- oo Consult nautical publications (gnomonic chart)
- oo Set courses
- oo Plan a passage (Mediterranean sea)
- oo Plan a passage (Cross Ocean)

## Practical Electronic Navigation System

- oo Radar Plotting
- oo ARPA
- oo Compass Work
- oo Principle of Electronic chart



## Cargo Handling and Stowage

- oo Supervise the preparation of holds and deep tanks for loading
- oo Supervise the preparation of holds and deep tanks for loading
- oo Supervise the operation of the ship's cargo gear
- oo Inspect hatch covers, gear and cargoes before and during discharging
- oo Ensure that all cargoes are discharged in good condition
- oo Identify any damage to ship cargo after discharging and establish possible causes
- oo Supervise the loading taking into account the effect of cargo including heavy lifts on seaworthiness and stability of the ship
- oo Stowage Principle
- oo Inspect the cargo at regular intervals
- oo Record all inspections and the conditions found
- oo Ensure a solid stow and securing of all cargoes in packaged form
- oo Ensure separation between bulk cargoes or packaged goods if required
- oo Stowage and securing of dangerous, hazardous and harmful cargoes and their effect on the safety of life and on the ship
- oo Stowage and securing of dangerous, hazardous and harmful cargoes and their effect on the safety of life and on the ship
- oo Take actions to avoid damage to the ship or cargo
- oo Ventilation & Cargo Documents
- oo Ensure that adequate precautions are taken to ensure ventilation and facilitate inspection during the voyage

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## Program of Study for Marine Engineering Cadets Semester Training Onboard Training Ship AIDA IV

### Objectives of the Guided Sea Training

The purpose of the guided sea training is to train the cadets intentionally and effectively to cultivate the necessary attributes and ability to be a competent ship's engineer.

The immediate objectives would be set up as follows:

To cultivate such attributes of the cadets as adaptability, discipline, sense of responsibility, determination, endurance and the spirit of cooperation that are indispensable elements for ship's engineer.

To develop practical knowledge of proficiency of cadets through seagoing experience, which makes integration of their theoretical study and practical training up to a desired standard based on the syllabus of sea training.

### Bases of Course Selection

This course is selected to achieve the following:

The syllabus of the sea training phase.

The course of an engineering officer in charge of a watch according to STCW convention.

To match the engineering equipment on board the training ship.



Course Code	Course Title	CR
MM 322	Marine Diesel Engine (2)	2
MM 312	Marine Engineering (2)	2
MM 342	Naval Architecture & Ship Construction (2)	2
EE 320	Marine Electrical Engineering	1
EE 310	Marine Control Systems	2
MM 313	Watch keeping Duties	2
ND 310	Nautical Technology	1
ND 370	Marine Safety	1
P 305	Physical Education (5)	0.5
L 305	Leadership (5)	0.5

### Lectures and Practical Training Schedule

Note:

As required by **STCW 95** and amendments in Manila2010

“Engineering Cadets Training and Assessment Record Book”

#### Section 1

5-No on- board training or assessment should take place unless such activities can be carried out without interfering with the normal operation of the ship, jeopardizing safety of the life at sea, or posing a risk of marine pollution.

Instructors and/or assessors should be able to devote their time and attention exclusively to the instruction and assessment activity at hand, or if unable to do so, should defer the activity until a more suitable time.

### Marine Diesel Engine (2) MM 322

- oo Layout of engine room.
- oo Diesel propulsion plant data.
- oo Parts of main engine.
- oo Main engine piping system.
- oo Preparation procedure for main engine before sailing.
- oo Auxiliarydieselengines(Specifications, Performance and operation).
- oo Exhaust gas system and air scavenging system.
- oo Turbocharger and air cooler.
- oo Reduction/Reversing Gear.
- oo Maintenance of main engines and auxiliary diesel engines.
- oo Tappet clearance and web deflection.
- oo Main engine performance and power calculation.
- oo Air Compressors.
- oo Main engines and Auxiliary diesel engines troubles and remedies.
- oo Two stroke diesel engines.

### Marine Engineering (2) MM 312

- oo Tanks arrangement and enclosed spaces.
- oo Compressed air system.
- oo Fuel oil and lubricating oil transfer and service systems.
- oo Engine room ventilation system.
- oo Bilge and ballast systems.
- oo Fresh water service systems.
- oo Domestic services.
- oo Fresh water generator.
- oo Pumps and valves.
- oo Heat exchangers.
- oo Steering gear and bow thruster.
- oo Treatment of fuel oil and lubricating oil.



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- o Shafting arrangement and stern tube.
- o Steam and feed water systems.
- o Auxiliary boiler and exhaust gas economizer.
- o Pollution prevention (oily water separator, sewage treatment plant).
- o Deck machinery.
- o Refrigeration and Air Conditioning.
- o Water treatment for cooling water and boiler feed water.

## Watch Keeping Duties MM 313

- o Know your training vessel.
- o Watch in port.
- o Taking over the watch during sea going.
- o Watch keeping routine.
- o Engine room log book data.
- o Tanks sounding.
- o Bunkering.
- o Handing over the watch during sea going and in port.
- o Watch keeping routine during docking.
- o Preparation for maneuvering.
- o Routine maintenance in engine room.
- o Emergency cases in engine room.
- o Communication with the officer in charge of the watch.

## Marine Safety ND 370

- o Some safety instructions on board ship.
- o Safety in the engine room.
- o Training manual, muster list, safety equipment and alarm signals.
- o Fire safety:
  - o Firefighting equipment and arrangements.
  - o Fire detection and fire alarm circuit.
  - o Fire prevention and protection.
  - o Ship's fire control plan.
  - o Fire safety (during docking).
  - o Fire drills.
  - o Survival at sea (life saving appliances).
  - o In the survival craft.
  - o Survival drills.
  - o Routine maintenance of safety equipment.

## Nautical Technology ND 310

- o Uses of ship's anchor and cable length.
- o Ship mooring alongside a quay.
- o Lay out of wheel house.
- o Wheel house instruments and their functions.
- o Watch in wheel house.
- o Anchor and cable maintenance.
- o Practical ship handling.



## Marine Control Systems EE 310

- oo Open and closed loop control systems.
- oo Block diagram.
- oo Function of each component in closed loop system.
- oo Open and closed loop control systems on board training ship.
- oo Different sensing elements.
- oo Measuring pressures, temperatures, levels and flow rates on board training ship.
- oo Some control systems on board training ship.
- oo Auxiliary boiler control system (starting & operation).

## Naval Architecture & Ship Construction MM 342 (2)

- oo Principal particulars and general arrangement of training ship.
- oo Decks lay out.
- oo Basic types of ships.
- oo Ship geometry and terminology.
- oo Tonnage and ship's marks.
- oo Elements of training ship.
- oo Forces acting on a ship.
- oo Stresses and strains in ship structure.
- oo Basic hull strength.
- oo Systems of framing.
- oo Ship sections from bow to stern.
- oo Docking.
- oo Types of rudders.
- oo Classification societies.

## Marine Electrical Engineering EE 320

- oo AC generator (Theory of operation, circuit diagram, maintenance).
- oo AC generator (Trouble shooting).
- oo Main circuit breakers (Types, safety devices).
- oo Main switch board.
- oo Parallel operation of generators.
- oo AC motors.
- oo Starter panels.
- oo Electrical power arrangement during docking.
- oo Routine maintenance of electrical equipment.
- oo Emergency generator.
- oo Alarm system in engine room.
- oo Emergency batteries.
- oo Illumination systems.

## Grading System

	Percentage Equivalent
A	90% or above
B+	85% to 89.99%
B	80% to 84.99%
B-	75% to 79.99%
C	70% to 74.99%
U	Less than 70%

