IAMU 2010 Research Project
(No. 2010-4)

Research on algorithm of collecting valuable information MET system and Human Resource Database in IAMU Members Universities/Institution

By

Odessa National Maritime Academy (ONMA)

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IAMU
International Association of Maritime Universities

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By
Odessa National Maritime Academy (ONMA)

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Research Partners : Masao Furusho, Professor, KU-GSMS
Bogumil Laczynski, Professor, GMU

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Research on algorithm of collecting valuable information MET system and Human Resource Database in IAMU Members Universities/Institution

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Abstract

IAMU was founded more then ten years ago. But for this moment there are any publications with compare information about IAMU Members MET system. The research participants will prepare the algorithm for collect and analyse the necessary information and convert it in matrix form. Above research work is an initial stage of comprehensive analyze of system of education of IAMU Members Institution. Well prepared algorithm with strictly formed information and database on initial stage of research is to be collected by selected members of IAMU. Desirable goal is to identify the current status of academic degree program which means not only a bachelor degree but also a master degree.
The research participants will prepare the algorithm for collect and analyse the necessary information and convert it in matrix form and human resource database includes comparison indicators such as an academic degree, a license, a certificate, teaching subjects, research subjects and so on

Keyword*:* IAMU members, MET, Database, Algorithm, IAMU Members Database

1.Introduction

In formal and informal discussion between representatives of IAMU members Institution lack of valuable information concerning national system of MET, qualification of teachers/instructors, existing system of professional career etc. is observed. Proper collected information are very useful and utilized in different national system of MET and its exchange should be considered by IAMU members.
Establishing of proper Database according to original algorithm prepared by group of researchers gives a tool for developing National model and methods of MET system.

This sample article is to show you how to prepare your full paper in a regulate style for the proceeding of the IAMU Capacity building Project.
It offers you a template for paper layout, and describes points you should notice before you submit your papers. Please use the styles defined in the template for all sections of the paper.

2. Research Objectives

The research participants will prepare the algorithm for collect and analyse the necessary information and convert it in matrix form and human resource database includes comparison indicators such as an academic degree, a license, a certificate, teaching subjects, research subjects and so on

3. Research Details and Results

3.1 Research activities and proceedings*
3.1.1 Project Meeting #1

15 -17 August 2010
Odessa National Maritime Academy
Venue: Odessa National Maritime Academy, Room 220

Project Title: "Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions"

Project Meeting Participants:

Prof. M. Miyusov, ONMA Rector
Prof. M. Tsimbal, Dean maritime Navigation Faculty, ONMA
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, Kobe University, Graduate School of Maritime Sciences
Professor Bogumil Laczynski, Gdynia Maritime University

Project Questionnaire and Project Flow – Chart Algorithm have been prepared by Meeting Participants.
In accordance with prepared Questionnaires and Flow – Chart Algorithm by Meeting participants it is agreed to prepare Pilot information about their Maritime Universities (ONMA, KU GSMS and GMU). After comparing and correcting, these materials should be sent by e-mail to IAMU Members by the 30th of September 2010. Also this pilot information together with Questionnaires and Flow – Chart Algorithm should be printed in small booklet form and distributed during AGA 11 in Korea Maritime University to all IAMU delegates, 15-17 October 2010. Every IAMU Member kindly ask to appoint a contact person for this project, fill in and send the necessary forms to Project Coordinator by the 30th of November 2010. At the middle of December 2010 Project's participants have to organize meeting to analyze obtained information from IAMU Members. Additional meeting may be required at the end of the January 2011.

Final analyse of the materials will be published in 60 copies by the 28th of February 2011.

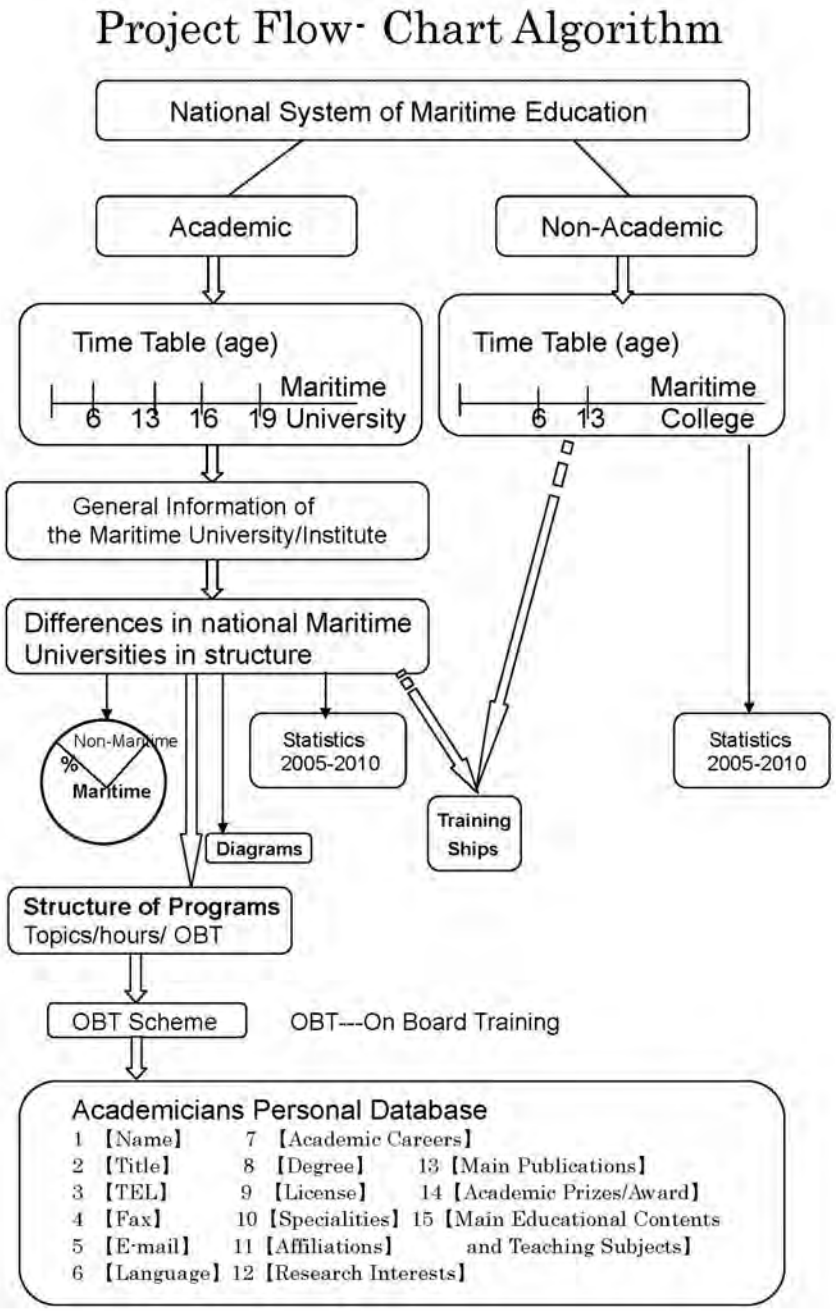


Fig. 1 Project's collecting information Algorithm

Project Questionnaire:

1. National system of the education and MET in the Country.
2. General information of the Institution
   - Name of the Institution:
     President:
     Address:
     Phone/fax numbers:
     Fax:
     URL:
   - Structure of the Institution
   - Teaching Staff Total quantity (Professor, PHD, Lecturers, Instructor)
     - Name
     - Title
     - TEL
     - FAX
     - E-mail
     - Language
     - Academic Careers
     - Degree
     - License
     - Specialities
     - Affiliations
     - Research Interests
     - Main Publications
     - Academic Prizes/Award
     - Main Educational Contents and Teaching Subjects
   - Students/Cadets total quantity and separate by Faculties
3. Structure of Programs(Topics/Hours/OBT)
4. Training ship, if yes please insert particulars.
5. OBT Scheme

3.1.2 Project Meeting #2.

16.10.2010
Korea Maritime University
Venue: Korea Maritime University, International Meeting Room

Project Title: "Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions"

Project Meeting Participants:
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, KU GSMS
Professor Bogumil Laczynski, GMU
Associate Professor Xu Bin, DMU
Professor Jin Soo Park, KMU

During the Meeting was discused the Project Algorithm and Questionaire.
Capt. D. Zhukov presented to Meeting Partisipant PPT Presentation"Research on algorithm of collecting valuable information MET system and Human Resource Database in IAMU Members Universities/Institution". This PPT Presentation was present to all AGA 11 delegates on the last day of AGA 11.

It was mentioned that without support from all IAMU Members it's impossible to complete IAMU Database.

3.1.3 Participation at IAMU AGA 11 in Busan, Korea, 15 -17 October, 2010.

During the AGA 11 in Busan the Project Coordinator Capt. D. Zhukov made Presentation on the Project`s Interim Report titled on "Research on algorithm of collecting valuable information MET system and Human Resource Database in IAMU Members Universities/Institution"
Sea attached file: Research on algorithm of collecting valuable information MET.ppt

3.1.4 Project meeting #3 (Final Meeting)

16 -18 December 2010
Gdynia Maritime University
Venue: Radisson Blu Hotel
Gdynia Maritime University Room 129

Project Title: "Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions"

Project Meeting Participants:
Professor Romuald Cwilewich, GMU Rector
Professor Adam Weintrit, Dean Navigational Faculty, GMU
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, KU GSMS
Professor Bogumil Laczynski, GMU

Support staff:
Joanna Mollin, GMU
Anjey Starosta, GMU

During Project meeting were analyze and discuse the Project Results.
It was mentioned that all Project work has done in accordance with Project Shcedule.

There are 54 IAMU members University/Institution:

Region 1 (Asia/Pacific)
AMET University (India)
Australian Maritime College (Australia)
Dalian Maritime University (China)
Jimei University (China)
John B.Lacson Foundation Maritime Univirsity (Philippines)
Kobe University, Graduate School of Maritime Sciences (Japan)
Korea Maritime University (Korea)
Mokpo National Maritime University (Korea)
Shanghai Maritime University (China)
Tianjin University of Technology (China)
Tokyo University of Marine Science and Technology, Faculty of Marine Technology(Japan)
University of Transport in Ho Chi Minh City(Vietnam)
Vietnam Maritime University (Vietnam)

Region 2 (Europe(EU))
Constanta Maritime University(Romania)
Danish Maritime University(Denmark)
Ecole Nationale de la Marine Marchande de Marseille (France)
Estonian Maritime Academy(Estonia)
Gdynia Maritime University (Poland)
Liverpool John Moores University (UK)
Hochschule Wismar, University of Applied Sciences - Technology, Business and Design (Germany)
Maritime Institute Willem Barentsz of the Northern University of Professional Education Leeuwarden(Netherlands)
Nicola Y. Vaptsarov Naval Academy(Bulgaria)
Polytechnical University of Catalonia, Faculty of Nautical Studies (Spain)
Satakunta University of Applied Sciences(Finland)
Southampton Solent University(UK)
Szczecin Maritime University (Poland)
University of Applied Sciences Oldenburg/Ostfriesland/Wilmshaven, Department of Maritime Studies(Germany)
University of Cantabria - Escuela Tecnica Superior de Nautica (Spain)
Wismar University of Technology, Business and Design (Germany)
World Maritime University (Sweden)

Region 3 (Americas)
Fisheries and Marine Institute of Memorial University of Newfoundland (FMIMUN)
Maine Maritime Academy (USA)
Massachusetts Maritime Academy (USA)
State University of New York Maritime College (USA)
Texas A&M University at Galveston (USA)
The California Maritime Academy (USA)
US Merchant Marine Academy (USA)

Region 4 (Africa/Central Europe)
Admiral Makarov State Maritime Academy (Russia)
Admiral Ushakov Maritime StateAcademy (Russia)
Arab Academy for Science & Technology and Maritime Transport(Egypt)
Baltic Fishing Fleet State Academy (Russia)
Batumi State Maritime Academy(Georgia)
Dokuz Eylul University, Maritime Faculty(Turkey)
Far Eastern State Technical Fisheries University/ Dalrybvtuz (Russia)
IRISL Maritime Training Institute (Iran)
Istanbul Technical University, Maritime Faculty (Turkey)
Karadeniz Technical University,Faculty of Marine Science (Turkey)
Kyiv State Maritime Academy (Ukraine)
Maritime State University named after Admiral G.I. Nevelskoy(Russia)
Odesa National Maritime Academy (Ukraine)
Odessa National Maritime University(Ukraine)
Regional Maritime University(Ghana)
University of Rijeka, Faculty of Maritime Studies(Croatia)

Special Member
The Nippon Foundation(Japan)

We have received 13 reports with necessary information from following IAMU members :

Region 1 (Asia/Pacific)
Kobe University, Graduate School of Maritime Sciences (Japan), prepared by Prof. Furusho

Tokyo University of Marine Science and Technology, Faculty of Marine Technology(Japan)(Joint report with Kobe University, Graduate School of Maritime Sciences)

Region 2 (Europe(EU))
Gdynia Maritime University (Poland), prepared by Prof. Laczynski
Polytechnical University of Catalonia, Faculty of Nautical Studies (Spain),
prepared by Prof. De Melo
Szczecin Maritime University (Poland)(Joint report with Gdynia Maritime University)

Region 3 (Americas)

Region 4 (Africa/Central Europe)
Admiral Makarov State Maritime Academy (Russia), prepared by Ms. Kozlova
Admiral Ushakov Maritime StateAcademy (Russia), prepared by Prof. Faivisovich
Batumi State Maritime Academy(Georgia), prepared by Prof. Gegenava
Istanbul Technical University, Maritime Faculty (Turkey), prepared by Prof. Güller
Karadeniz Technical University,Faculty of Marine Science (Turkey), prepared by Prof. Duzgunes
Kyiv State Maritime Academy (Ukraine), prepared by Prof. Nosovskyy
Odessa National Maritime Academy (Ukraine), prepared by Capt. Zhukov
University of Rijeka, Faculty of Maritime Studies(Croatia), prepared by Prof. Pritchard

Response ratio is:

13 / 54 x 100% = 24%

24% response ratio(quarter of all IAMU Members) – is a very good result for such short time term of the collecting MET information.

During the Meeting the e-version of the Project Database was presented by D. Zhukov.
Web-address of the database is http://zhukov.seafarer.od.ua/
All above information, reseived from IAMU members will be inserting in e-version of the IAMU databases.
Few response from IAMU Members were very disappointed with capacity of the work of the prepare such MET information for IAMU Database.

Meetings participants noted that it is necesary to istablish more productive system of the collecting information for the Fase 2 of the Project fo IAMU FY2011. Region coordinators should organize necessary quantity of the bisness trips for collecting MET information from region institutions.
Project participants kindly ask IAMU IEB to determine the time period of the upgrading IAMU Database information and recommend to all IAMU Members to appoint the responsible person for future collecting and upgrade IAMU information.
It was noted that all future information should be prepared by responsible persons from IAMU Members in accordance with “Proposed format of the collecting information” (Sea Para 5.2.12).

4. Research results

4.1 Theory Background

4.1.1 Algorithm

In mathematics, computer science, and related subjects, an **algorithm** (derived from the name of mathematician al-Khwārizmī) is an effective method for solving a problem expressed as a finite sequence of steps. Algorithms are used for calculation, data processing, and many other fields. (In more advanced or abstract settings, the instructions do not necessarily constitute a finite sequence, and even not necessarily a sequence; see, e.g., "nondeterministic algorithm".)

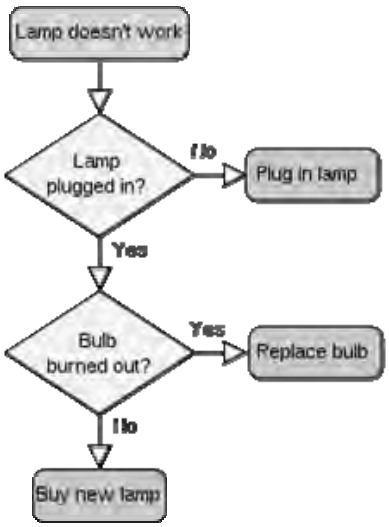


Fig. 2 Algorithm example

This is an algorithm that tries to figure out why the lamp doesn't turn on and tries to fix it using the steps. Flowcharts are often used to represent algorithms graphically.
Each algorithm is a list of well-defined instructions for completing a task. Starting from an initial state, the instructions describe a computation that proceeds through a well-defined series of successive states, eventually terminating in a final ending state. The transition from one state to the next is not necessarily deterministic; some algorithms, known as randomized algorithms, incorporate randomness.
A partial formalization of the concept began with attempts to solve the Entscheidungs problem (the "decision problem") posed by David Hilbert in 1928. Subsequent formalizations were framed as attempts to define "effective calculability"[1] or "effective method";[2] those formalizations included the Gödel–Herbrand–Kleene recursive functions of 1930, 1934 and 1935, Alonzo Church's lambda calculus of 1936, Emil Post's "Formulation 1" of 1936, and Alan Turing's Turing machines of 1936–7 and 1939.
The adjective "continuous" when applied to the word "algorithm" can mean:
1. An algorithm operating on data that represents continuous quantities, even though this data is represented by discrete approximations – such algorithms are studied in numerical analysis; or
An algorithm in the form of a differential equation that operates continuously on the data, running on an analog computer.[3]
Why algorithms are necessary: an informal definition
For a detailed presentation of the various points of view around the definition of "algorithm" see Algorithm characterizations. For examples of simple addition algorithms specified in the detailed manner described in Algorithm characterizations, see Algorithm examples.

While there is no generally accepted formal definition of "algorithm," an informal definition could be "a process that performs some sequence of operations." For some people, a program is only an algorithm if it stops eventually. For others, a program is only an algorithm if it stops before a given number of calculation steps.
A prototypical example of an algorithm is Euclid's algorithm to determine the maximum common divisor of two integers.
We can derive clues to the issues involved and an informal meaning of the word from the following quotation from Boolos & Jeffrey (1974, 1999) (boldface added):
No human being can write fast enough, or long enough, or small enough† (†"smaller and smaller without limit ...you'd be trying to write on molecules, on atoms, on electrons") to list all members of an enumerably infinite set by writing out their names, one after another, in some notation. But humans can do something equally useful, in the case of certain enumerably infinite sets: They can give explicit instructions for determining the nth member of the set, for arbitrary finite n. Such instructions are to be given quite explicitly, in a form in which they could be followed by a computing machine, or by a human who is capable of carrying out only very elementary operations on symbols[4]
The term "enumerably infinite" means "countable using integers perhaps extending to infinity." Thus Boolos and Jeffrey are saying that an algorithm implies instructions for a process that "creates" output integers from an arbitrary "input" integer or integers that, in theory, can be chosen from 0 to infinity. Thus we might expect an algorithm to be an algebraic equation such as y = m + n — two arbitrary "input variables" m and n that produce an output y. As we see in Algorithm characterizations — the word algorithm implies much more than this, something on the order of (for our addition example):
Precise instructions (in language understood by "the computer") for a "fast, efficient, good" process that specifies the "moves" of "the computer" (machine or human, equipped with the necessary internally contained information and capabilities) to find, decode, and then munch arbitrary input integers/symbols m and n, symbols + and = ... and (reliably, correctly, "effectively") produce, in a "reasonable" time, output-integer y at a specified place and in a specified format.
The concept of algorithm is also used to define the notion of decidability. That notion is central for explaining how formal systems come into being starting from a small set of axioms and rules. In logic, the time that an algorithm requires to complete cannot be measured, as it is not apparently related with our customary physical dimension. From such uncertainties, that characterize ongoing work, stems the unavailability of a definition of algorithm that suits both concrete (in some sense) and abstract usage of the term.

Formalization
Algorithms are essential to the way computers process information. Many computer programs contain algorithms that specify the specific instructions a computer should perform (in a specific order) to carry out a specified task, such as calculating employees' paychecks or printing students' report cards. Thus, an algorithm can be considered to be any sequence of operations that can be simulated by a Turing-complete system. Authors who assert this thesis include Minsky (1967), Savage (1987) and Gurevich (2000):
Minsky: "But we will also maintain, with Turing . . . that any procedure which could "naturally" be called effective, can in fact be realized by a (simple) machine. Although this may seem extreme, the arguments . . . in its favor are hard to refute".[5]
Gurevich: "...Turing's informal argument in favor of his thesis justifies a stronger thesis: every algorithm can be simulated by a Turing machine ... according to Savage [1987], an algorithm is a computational process defined by a Turing machine".[6]
Typically, when an algorithm is associated with processing information, data is read from an input source, written to an output device, and/or stored for further processing. Stored data is regarded as part of the internal state of the entity performing the algorithm. In practice, the state is stored in one or more data structures.
For some such computational process, the algorithm must be rigorously defined: specified in the way it applies in all possible circumstances that could arise. That is, any conditional steps must be systematically dealt with, case-by-case; the criteria for each case must be clear (and computable).
Because an algorithm is a precise list of precise steps, the order of computation will always be critical to the functioning of the algorithm. Instructions are usually assumed to be listed explicitly, and are

described as starting "from the top" and going "down to the bottom", an idea that is described more formally by flow of control.
So far, this discussion of the formalization of an algorithm has assumed the premises of imperative programming. This is the most common conception, and it attempts to describe a task in discrete, "mechanical" means. Unique to this conception of formalized algorithms is the assignment operation, setting the value of a variable. It derives from the intuition of "memory" as a scratchpad. There is an example below of such an assignment.
For some alternate conceptions of what constitutes an algorithm see functional programming and logic programming .

Termination
Some writers restrict the definition of algorithm to procedures that eventually finish. In such a category Kleene places the "decision procedure or decision method or algorithm for the question".[7] Others, including Kleene, include procedures that could run forever without stopping; such a procedure has been called a "computational method"[8] or "calculation procedure or algorithm (and hence a calculation problem) in relation to a general question which requires for an answer, not yes or no, but the exhibiting of some object".[9]
Minsky makes the pertinent observation, in regards to determining whether an algorithm will eventually terminate (from a particular starting state):
But if the length of the process isn't known in advance, then "trying" it may not be decisive, because if the process does go on forever—then at no time will we ever be sure of the answer.[5]
As it happens, no other method can do any better, as was shown by Alan Turing with his celebrated result on the undecidability of the so-called halting problem. There is no algorithmic procedure for determining whether or not arbitrary algorithms terminate from given starting states. The analysis of algorithms for their likelihood of termination is called termination analysis.
See the examples of (im-)"proper" subtraction at partial function for more about what can happen when an algorithm fails for certain of its input numbers—e.g., (i) non-termination, (ii) production of "junk" (output in the wrong format to be considered a number) or no number(s) at all (halt ends the computation with no output), (iii) wrong number(s), or (iv) a combination of these. Kleene proposed that the production of "junk" or failure to produce a number is solved by having the algorithm detect these instances and produce e.g., an error message (he suggested "0"), or preferably, force the algorithm into an endless loop.[10] Davis (1958) does this to his subtraction algorithm—he fixes his algorithm in a second example so that it is proper subtraction and it terminates.[11] Along with the logical outcomes "true" and "false" Kleene (1952) also proposes the use of a third logical symbol "u" — undecided[12] — thus an algorithm will always produce something when confronted with a "proposition". The problem of wrong answers must be solved with an independent "proof" of the algorithm e.g., using induction:
We normally require auxiliary evidence for this [that the algorithm correctly defines a mu recursive function], e.g, in the form of an inductive proof that, for each argument value, the computation terminates with a unique value.[13]

Expressing algorithms
Algorithms can be expressed in many kinds of notation, including natural languages, pseudocode, flowcharts, programming languages or control tables (processed by interpreters). Natural language expressions of algorithms tend to be verbose and ambiguous, and are rarely used for complex or technical algorithms. Pseudocode, flowcharts and control tables are structured ways to express algorithms that avoid many of the ambiguities common in natural language statements, while remaining independent of a particular implementation language. Programming languages are primarily intended for expressing algorithms in a form that can be executed by a computer, but are often used as a way to define or document algorithms.
There is a wide variety of representations possible and one can express a given Turing machine program as a sequence of machine tables (see more at finite state machine and state transition table), as flowcharts (see more at state diagram), or as a form of rudimentary machine code or assembly code called "sets of quadruples" (see more at Turing machine).

Sometimes it is helpful in the description of an algorithm to supplement small "flow charts" (state diagrams) with natural-language and/or arithmetic expressions written inside "block diagrams" to summarize what the "flow charts" are accomplishing.

Representations of algorithms are generally classed into three accepted levels of Turing machine description:[14]
1 High-level description:
"...prose to describe an algorithm, ignoring the implementation details. At this level we do not need to mention how the machine manages its tape or head."
2 Implementation description:
"...prose used to define the way the Turing machine uses its head and the way that it stores data on its tape. At this level we do not give details of states or transition function."
3 Formal description:
Most detailed, "lowest level", gives the Turing machine's "state table".
For an example of the simple algorithm "Add m+n" described in all three levels see Algorithm examples.

Computer algorithms
In computer systems, an algorithm is basically an instance of logic written in software by software developers to be effective for the intended "target" computer(s), in order for the software on the target machines to do something. For instance, if a person is writing software that is supposed to print out a PDF document located at the operating system folder "/My Documents" at computer drive "D:" every Friday at 10 pm, they will write an algorithm that specifies the following actions: "If today's date (computer time) is 'Friday,' open the document at 'D:/My Documents' and call the 'print' function". While this simple algorithm does not look into whether the printer has enough paper or whether the document has been moved into a different location, one can make this algorithm more robust and anticipate these problems by rewriting it as a formal CASE statement[15] or as a (carefully crafted) sequence of IF-THEN-ELSE statements.[16] For example the CASE statement might appear as follows (there are other possibilities):
CASE 1: IF today's date is NOT Friday THEN exit this CASE instruction ELSE
CASE 2: IF today's date is Friday AND the document is located at 'D:/My Documents' AND there is paper in the printer THEN print the document (and exit this CASE instruction) ELSE
CASE 3: IF today's date is Friday AND the document is NOT located at 'D:/My Documents' THEN display 'document not found' error message (and exit this CASE instruction) ELSE
CASE 4: IF today's date is Friday AND the document is located at 'D:/My Documents' AND there is NO paper in the printer THEN (i) display 'out of paper' error message and (ii) exit.
Note that CASE 3 includes two possibilities: (i) the document is NOT located at 'D:/My Documents' AND there's paper in the printer OR (ii) the document is NOT located at 'D:/My Documents' AND there's NO paper in the printer.
The sequence of IF-THEN-ELSE tests might look like this:
TEST 1: IF today's date is NOT Friday THEN done ELSE TEST 2:
TEST 2: IF the document is NOT located at 'D:/My Documents' THEN display 'document not found' error message ELSE TEST 3:
TEST 3: IF there is NO paper in the printer THEN display 'out of paper' error message ELSE print the document.
These examples' logic grants precedence to the instance of "NO document at 'D:/My Documents' ". Also observe that in a well-crafted CASE statement or sequence of IF-THEN-ELSE statements the number of distinct actions—4 in these examples: do nothing, print the document, display 'document not found', display 'out of paper' – equals the number of cases.
Given unlimited memory, a computational machine with the ability to execute either a set of CASE statements or a sequence of IF-THEN-ELSE statements is Turing complete. Therefore, anything that is computable can be computed by this machine. This form of algorithm is fundamental to computer programming in all its forms (see more at McCarthy formalism).

Implementation

Most algorithms are intended to be implemented as computer programs. However, algorithms are also implemented by other means, such as in a biological neural network (for example, the human brain implementing arithmetic or an insect looking for food), in an electrical circuit, or in a mechanical device.

Example

Further information: Algorithm examples

An animation of the quicksort algorithm sorting an array of randomized values. The red bars mark the pivot element; at the start of the animation, the element farthest to the right hand side is chosen as the pivot.

One of the simplest algorithms is to find the largest number in an (unsorted) list of numbers. The solution necessarily requires looking at every number in the list, but only once at each. From this follows a simple algorithm, which can be stated in a high-level description English prose, as:

High-level description:

1.Assume the first item is largest.

2.Look at each of the remaining items in the list and if it is larger than the largest item so far, make a note of it.

3.The last noted item is the largest in the list when the process is complete.

(Quasi-)formal description: Written in prose but much closer to the high-level language of a computer program, the following is the more formal coding of the algorithm in pseudocode or pidgin code:

```
Algorithm LargestNumber
 Input: A non-empty list of numbers L.
 Output: The largest number in the list L.
 largest ← L0
 for each item in the list (Length(L)≥1), do
  if the item > largest, then
   largest ← the item
 return largest
```

- "←" is a loose shorthand for "changes to". For instance, "largest ← item" means that the value of largest changes to the value of item.
- "return" terminates the algorithm and outputs the value that follows.

Algorithmic analysis

It is frequently important to know how much of a particular resource (such as time or storage) is theoretically required for a given algorithm. Methods have been developed for the analysis of algorithms to obtain such quantitative answers (estimates); for example, the algorithm above has a time requirement of O(n), using the big O notation with n as the length of the list. At all times the algorithm only needs to remember two values: the largest number found so far, and its current position in the input list. Therefore it is said to have a space requirement of O(1), if the space required to store the input numbers is not counted, or O(n) if it is counted.

Different algorithms may complete the same task with a different set of instructions in less or more time, space, or 'effort' than others. For example, a binary search algorithm will usually outperform a brute force sequential search when used for table lookups on sorted lists.

Formal versus empirical
The analysis and study of algorithms is a discipline of computer science, and is often practiced abstractly without the use of a specific programming language or implementation. In this sense, algorithm analysis resembles other mathematical disciplines in that it focuses on the underlying properties of the algorithm and not on the specifics of any particular implementation. Usually pseudocode is used for analysis as it is the simplest and most general representation. However, ultimately, most algorithms are usually implemented on particular hardware / software platforms and their algorithmic efficiency is eventually put to the test using real code.
Empirical testing is useful because it may uncover unexpected interactions that affect performance. Benchmarks may be used to compare before/after potential improvements to an algorithm after program optimization.

Classification
There are various ways to classify algorithms, each with its own merits.
By implementation
One way to classify algorithms is by implementation means.
Recursion or iteration: A recursive algorithm is one that invokes (makes reference to) itself repeatedly until a certain condition matches, which is a method common to functional programming. Iterative algorithms use repetitive constructs like loops and sometimes additional data structures like stacks to solve the given problems. Some problems are naturally suited for one implementation or the other. For example, towers of Hanoi is well understood in recursive implementation. Every recursive version has an equivalent (but possibly more or less complex) iterative version, and vice versa.
Logical: An algorithm may be viewed as controlled logical deduction. This notion may be ex pressed as: Algorithm = logic + control.[17] The logic component expresses the axioms that may be used in the computation and the control component determines the way in which deduction is applied to the axioms. This is the basis for the logic programming paradigm. In pure logic programming languages the control component is fixed and algorithms are specified by supplying only the logic component. The appeal of this approach is the elegant semantics: a change in the axioms has a well defined change in the algorithm.
Serial or parallel or distributed: Algorithms are usually discussed with the assumption that computers execute one instruction of an algorithm at a time. Those computers are sometimes called serial computers. An algorithm designed for such an environment is called a serial algorithm, as opposed to parallel algorithms or distributed algorithms. Parallel algorithms take advantage of computer architectures where several processors can work on a problem at the same time, whereas distributed algorithms utilize multiple machines connected with a network. Parallel or distributed algorithms divide the problem into more symmetrical or asymmetrical subproblems and collect the results back together. The resource consumption in such algorithms is not only processor cycles on each processor but also the communication overhead between the processors. Sorting algorithms can be parallelized efficiently, but their communication overhead is expensive. Iterative algorithms are generally parallelizable. Some problems have no parallel algorithms, and are called inherently serial problems.
Deterministic or non-deterministic: Deterministic algorithms solve the problem with exact decision at every step of the algorithm whereas non-deterministic algorithms solve problems via guessing although typical guesses are made more accurate through the use of heuristics.
Exact or approximate: While many algorithms reach an exact solution, approximation algorithms seek an approximation that is close to the true solution. Approximation may use either a deterministic or a random strategy. Such algorithms have practical value for many hard problems.
Quantum algorithm: Quantum algorithm run on a realistic model of quantum computation. The term is usually used for those algorithms which seem inherently quantum, or use some essential feature of quantum computation such as quantum superposition or quantum entanglement.
By design paradigmAnother way of classifying algorithms is by their design methodology or paradigm. There is a certain number of paradigms, each different from the other. Furthermore, each of these categories will include many different types of algorithms. Some commonly found paradigms include:
Brute-force or exhaustive search. This is the naïve method of trying every possible solution to see which is best.[18]

Divide and conquer. A divide and conquer algorithm repeatedly reduces an instance of a problem to one or more smaller instances of the same problem (usually recursively) until the instances are small enough to solve easily. One such example of divide and conquer is merge sorting. Sorting can be done on each segment of data after dividing data into segments and sorting of entire data can be obtained in the conquer phase by merging the segments. A simpler variant of divide and conquer is called a decrease and conquer algorithm, that solves an identical subproblem and uses the solution of this subproblem to solve the bigger problem. Divide and conquer divides the problem into multiple subproblems and so the conquer stage will be more complex than decrease and conquer algorithms. An example of decrease and conquer algorithm is the binary search algorithm.
Dynamic programming. When a problem shows optimal substructure, meaning the optimal solution to a problem can be constructed from optimal solutions to subproblems, and overlapping subproblems, meaning the same subproblems are used to solve many different problem instances, a quicker approach called dynamic programming avoids recomputing solutions that have already been computed. For example, Floyd–Warshall algorithm, the shortest path to a goal from a vertex in a weighted graph can be found by using the shortest path to the goal from all adjacent vertices. Dynamic programming and memoization go together. The main difference between dynamic programming and divide and conquer is that subproblems are more or less independent in divide and conquer, whereas subproblems overlap in dynamic programming. The difference between dynamic programming and straightforward recursion is in caching or memoization of recursive calls. When subproblems are independent and there is no repetition, memoization does not help; hence dynamic programming is not a solution for all complex problems. By using memoization or maintaining a table of subproblems already solved, dynamic programming reduces the exponential nature of many problems to polynomial complexity.
The greedy method. A greedy algorithm is similar to a dynamic programming algorithm, but the difference is that solutions to the subproblems do not have to be known at each stage; instead a "greedy" choice can be made of what looks best for the moment. The greedy method extends the solution with the best possible decision (not all feasible decisions) at an algorithmic stage based on the current local optimum and the best decision (not all possible decisions) made in a previous stage. It is not exhaustive, and does not give accurate answer to many problems. But when it works, it will be the fastest method. The most popular greedy algorithm is finding the minimal spanning tree as given by Huffman Tree, Kruskal, Prim, Sollin.
Linear programming. When solving a problem using linear programming, specific inequalities involving the inputs are found and then an attempt is made to maximize (or minimize) some linear function of the inputs. Many problems (such as the maximum flow for directed graphs) can be stated in a linear programming way, and then be solved by a 'generic' algorithm such as the simplex algorithm. A more complex variant of linear programming is called integer programming, where the solution space is restricted to the integers.
Reduction. This technique involves solving a difficult problem by transforming it into a better known problem for which we have (hopefully) asymptotically optimal algorithms. The goal is to find a reducing algorithm whose complexity is not dominated by the resulting reduced algorithm's. For example, one selection algorithm for finding the median in an unsorted list involves first sorting the list (the expensive portion) and then pulling out the middle element in the sorted list (the cheap portion). This technique is also known as transform and conquer.
Search and enumeration. Many problems (such as playing chess) can be modeled as problems on graphs. A graph exploration algorithm specifies rules for moving around a graph and is useful for such problems. This category also includes search algorithms, branch and bound enumeration and backtracking.
Randomized algorithms are those that make some choices randomly (or pseudo-randomly); for some problems, it can in fact be proven that the fastest solutions must involve some randomness. There are two large classes of such algorithms:
Monte Carlo algorithms return a correct answer with high-probability. E.g. RP is the subclass of these that run in polynomial time)
Las Vegas algorithms always return the correct answer, but their running time is only probabilistically bound, e.g. ZPP.
In optimization problems, heuristic algorithms do not try to find an optimal solution, but an approximate solution where the time or resources are limited. They are not practical to find perfect

solutions. An example of this would be local search, tabu search, or simulated annealing algorithms, a class of heuristic probabilistic algorithms that vary the solution of a problem by a random amount. The name "simulated annealing" alludes to the metallurgic term meaning the heating and cooling of metal to achieve freedom from defects. The purpose of the random variance is to find close to globally optimal solutions rather than simply locally optimal ones, the idea being that the random element will be decreased as the algorithm settles down to a solution. Approximation algorithms are those heuristic algorithms that additionally provide some bounds on the error. Genetic algorithms attempt to find solutions to problems by mimicking biological evolutionary processes, with a cycle of random mutations yielding successive generations of "solutions". Thus, they emulate reproduction and "survival of the fittest". In genetic programming, this approach is extended to algorithms, by regarding the algorithm itself as a "solution" to a problem.

By field of study

Every field of science has its own problems and needs efficient algorithms. Related problems in one field are often studied together. Some example classes are search algorithms, sorting algorithms, merge algorithms, numerical algorithms, graph algorithms, string algorithms, computational geometric algorithms, combinatorial algorithms, medical algorithms, machine learning, cryptography, data compression algorithms and parsing techniques.

Fields tend to overlap with each other, and algorithm advances in one field may improve those of other, sometimes completely unrelated, fields. For example, dynamic programming was invented for optimization of resource consumption in industry, but is now used in solving a broad range of problems in many fields.

By complexity

Algorithms can be classified by the amount of time they need to complete compared to their input size. There is a wide variety: some algorithms complete in linear time relative to input size, some do so in an exponential amount of time or even worse, and some never halt. Additionally, some problems may have multiple algorithms of differing complexity, while other problems might have no algorithms or no known efficient algorithms. There are also mappings from some problems to other problems. Owing to this, it was found to be more suitable to classify the problems themselves instead of the algorithms into equivalence classes based on the complexity of the best possible algorithms for them.

By computing power

Another[dubious – discuss] way to classify algorithms is by computing power. This is typically done by considering some collection (class) of algorithms. A recursive class of algorithms is one that includes algorithms for all Turing computable functions. Looking at classes of algorithms allows for the possibility of restricting the available computational resources (time and memory) used in a computation. A subrecursive class of algorithms is one in which not all Turing computable functions can be obtained. For example, the algorithms that run in polynomial time suffice for many important types of computation but do not exhaust all Turing computable functions. The class of algorithms implemented by primitive recursive functions is another subrecursive class.

Burgin (2005, p. 24) uses a generalized definition of algorithms that relaxes the common requirement that the output of the algorithm that computes a function must be determined after a finite number of steps. He defines a super-recursive class of algorithms as "a class of algorithms in which it is possible to compute functions not computable by any Turing machine" (Burgin 2005, p. 107). This is closely related to the study of methods of hypercomputation.

Legal issues

Algorithms, by themselves, are not usually patentable. In the United States, a claim consisting solely of simple manipulations of abstract concepts, numbers, or signals does not constitute "processes" (USPTO 2006), and hence algorithms are not patentable (as in Gottschalk v. Benson). However, practical applications of algorithms are sometimes patentable. For example, in Diamond v. Diehr, the application of a simple feedback algorithm to aid in the curing of synthetic rubber was deemed patentable. The patenting of software is highly controversial, and there are highly criticized patents involving algorithms, especially data compression algorithms, such as Unisys' LZW patent.

Additionally, some cryptographic algorithms have export restrictions (see export of cryptography).

Etymology of the word Algorithm

The word "Algorithm" or "Algorism" in some other writing versions, comes from the name Al-Khwārizmī (c. 780-850), a Persian mathematician, astronomer, geographer and a scholar in the House

of Wisdom in Baghdad, whose name means "the native of Kharazm", a city that was part of the Greater Iran during his era and now is in modern day Uzbekistan[19][20][21] He wrote a treatise in Arabic language in the 9th century, which was translated into Latin in the 12th century under the title Algoritmi de numero Indorum. This title means "Algoritmi on the numbers of the Indians", where "Algoritmi" was the translator's Latinization of Al-Khwarizmi's name.[22] Al-Khwarizmi was the most widely read mathematician in Europe in the late Middle Ages, primarily through his other book, the Algebra.[23] In late medieval Latin, algorismus, the corruption of his name, simply meant the "decimal number system" that is still the meaning of modern English algorism. In 17th century French the word's form, but not its meaning, changed to algorithme, following the model of the word logarithme, this form alluding to the ancient Greek arithmos = arithmetic. English adopted the French very soon afterwards, but it wasn't until the late 19th century that "Algorithm" took on the meaning that it has in modern English.[24]

History: Development of the notion of "algorithm"

Discrete and distinguishable symbols

Tally-marks: To keep track of their flocks, their sacks of grain and their money the ancients used tallying: accumulating stones or marks scratched on sticks, or making discrete symbols in clay. Through the Babylonian and Egyptian use of marks and symbols, eventually Roman numerals and the abacus evolved (Dilson, p. 16–41). Tally marks appear prominently in unary numeral system arithmetic used in Turing machine and Post–Turing machine computations.

Manipulation of symbols as "place holders" for numbers: algebra

The work of the ancient Greek geometers (Euclidean algorithm), Persian mathematician Al-Khwarizmi (from whose name the terms "algorism" and "algorithm" are derived), and Western European mathematicians culminated in Leibniz's notion of the calculus ratiocinator (ca 1680):

A good century and a half ahead of his time, Leibniz proposed an algebra of logic, an algebra that would specify the rules for manipulating logical concepts in the manner that ordinary algebra specifies the rules for manipulating numbers.[25]

Mechanical contrivances with discrete states

The clock: Bolter credits the invention of the weight-driven clock as "The key invention [of Europe in the Middle Ages]", in particular the verge escapement[26] that provides us with the tick and tock of a mechanical clock. "The accurate automatic machine"[27] led immediately to "mechanical automata" beginning in the 13th century and finally to "computational machines" – the difference engine and analytical engines of Charles Babbage and Countess Ada Lovelace.[28]

Logical machines 1870 – Stanley Jevons' "logical abacus" and "logical machine": The technical problem was to reduce Boolean equations when presented in a form similar to what are now known as Karnaugh maps. Jevons (1880) describes first a simple "abacus" of "slips of wood furnished with pins, contrived so that any part or class of the [logical] combinations can be picked out mechanically . . . More recently however I have reduced the system to a completely mechanical form, and have thus embodied the whole of the indirect process of inference in what may be called a Logical Machine" His machine came equipped with "certain moveable wooden rods" and "at the foot are 21 keys like those of a piano [etc] . . .". With this machine he could analyze a "syllogism or any other simple logical argument".[29]

This machine he displayed in 1870 before the Fellows of the Royal Society.[30] Another logician John Venn, however, in his 1881 Symbolic Logic, turned a jaundiced eye to this effort: "I have no high estimate myself of the interest or importance of what are sometimes called logical machines ... it does not seem to me that any contrivances at present known or likely to be discovered really deserve the name of logical machines"; see more at Algorithm characterizations. But not to be outdone he too presented "a plan somewhat analogous, I apprehend, to Prof. Jevon's abacus ... [And] [a]gain, corresponding to Prof. Jevons's logical machine, the following contrivance may be described. I prefer to call it merely a logical-diagram machine ... but I suppose that it could do very completely all that can be rationally expected of any logical machine".[31]

Jacquard loom, Hollerith punch cards, telegraphy and telephony—the electromechanical relay: Bell and Newell (1971) indicate that the Jacquard loom (1801), precursor to Hollerith cards (punch cards, 1887), and "telephone switching technologies" were the roots of a tree leading to the development of the first computers.[32] By the mid-19th century the telegraph, the precursor of the telephone, was in use throughout the world, its discrete and distinguishable encoding of letters as "dots and dashes" a

common sound. By the late 19th century the ticker tape (ca 1870s) was in use, as was the use of Hollerith cards in the 1890 U.S. census. Then came the Teletype (ca. 1910) with its punched-paper use of Baudot code on tape.

Telephone-switching networks of electromechanical relays (invented 1835) was behind the work of George Stibitz (1937), the inventor of the digital adding device. As he worked in Bell Laboratories, he observed the "burdensome' use of mechanical calculators with gears. "He went home one evening in 1937 intending to test his idea... When the tinkering was over, Stibitz had constructed a binary adding device".[33]

Davis (2000) observes the particular importance of the electromechanical relay (with its two "binary states" open and closed):

It was only with the development, beginning in the 1930s, of electromechanical calculators using electrical relays, that machines were built having the scope Babbage had envisioned."[34]

Mathematics during the 1800s up to the mid-1900s

Symbols and rules: In rapid succession the mathematics of George Boole (1847, 1854), Gottlob Frege (1879), and Giuseppe Peano (1888–1889) reduced arithmetic to a sequence of symbols manipulated by rules. Peano's The principles of arithmetic, presented by a new method (1888) was "the first attempt at an axiomatization of mathematics in a symbolic language".[35]

But Heijenoort gives Frege (1879) this kudos: Frege's is "perhaps the most important single work ever written in logic. ... in which we see a " 'formula language', that is a lingua characterica, a language written with special symbols, "for pure thought", that is, free from rhetorical embellishments ... constructed from specific symbols that are manipulated according to definite rules".[36] The work of Frege was further simplified and amplified by Alfred North Whitehead and Bertrand Russell in their Principia Mathematica (1910–1913).

The paradoxes: At the same time a number of disturbing paradoxes appeared in the literature, in particular the Burali-Forti paradox (1897), the Russell paradox (1902–03), and the Richard Paradox.[37] The resultant considerations led to Kurt Gödel's paper (1931) — he specifically cites the paradox of the liar—that completely reduces rules of recursion to numbers.

Effective calculability: In an effort to solve the Entscheidungsproblem defined precisely by Hilbert in 1928, mathematicians first set about to define what was meant by an "effective method" or "effective calculation" or "effective calculability" (i.e., a calculation that would succeed). In rapid succession the following appeared: Alonzo Church, Stephen Kleene and J.B. Rosser's λ-calculus[38] a finely honed definition of "general recursion" from the work of Gödel acting on suggestions of Jacques Herbrand (cf. Gödel's Princeton lectures of 1934) and subsequent simplifications by Kleene.[39] Church's proof[40] that the Entscheidungsproblem was unsolvable, Emil Post's definition of effective calculability as a worker mindlessly following a list of instructions to move left or right through a sequence of rooms and while there either mark or erase a paper or observe the paper and make a yes-no decision about the next instruction.[41] Alan Turing's proof of that the Entscheidungsproblem was unsolvable by use of his "a- [automatic-] machine"[42] – in effect almost identical to Post's "formulation", J. Barkley Rosser's definition of "effective method" in terms of "a machine".[43] S. C. Kleene's proposal of a precursor to "Church thesis" that he called "Thesis I",[44] and a few years later Kleene's renaming his Thesis "Church's Thesis"[45] and proposing "Turing's Thesis".[46]

Emil Post (1936) and Alan Turing (1936–7, 1939)

Here is a remarkable coincidence of two men not knowing each other but describing a process of men-as-computers working on computations—and they yield virtually identical definitions.

Emil Post (1936) described the actions of a "computer" (human being) as follows:

"...two concepts are involved: that of a symbol space in which the work leading from problem to answer is to be carried out, and a fixed unalterable set of directions.

His symbol space would be

"a two way infinite sequence of spaces or boxes... The problem solver or worker is to move and work in this symbol space, being capable of being in, and operating in but one box at a time.... a box is to admit of but two possible conditions, i.e., being empty or unmarked, and having a single mark in it, say a vertical stroke.

"One box is to be singled out and called the starting point. ...a specific problem is to be given in symbolic form by a finite number of boxes [i.e., INPUT] being marked with a stroke. Likewise the answer [i.e., OUTPUT] is to be given in symbolic form by such a configuration of marked boxes....

"A set of directions applicable to a general problem sets up a deterministic process when applied to each specific problem. This process will terminate only when it comes to the direction of type (C) [i.e., STOP]".[47] See more at Post–Turing machine

Alan Turing's work[48] preceded that of Stibitz (1937); it is unknown whether Stibitz knew of the work of Turing. Turing's biographer believed that Turing's use of a typewriter-like model derived from a youthful interest: "Alan had dreamt of inventing typewriters as a boy; Mrs. Turing had a typewriter; and he could well have begun by asking himself what was meant by calling a typewriter 'mechanical'".[49] Given the prevalence of Morse code and telegraphy, ticker tape machines, and Teletypes we might conjecture that all were influences.

Turing—his model of computation is now called a Turing machine — begins, as did Post, with an analysis of a human computer that he whittles down to a simple set of basic motions and "states of mind". But he continues a step further and creates a machine as a model of computation of numbers.[50]

"Computing is normally done by writing certain symbols on paper. We may suppose this paper is divided into squares like a child's arithmetic book....I assume then that the computation is carried out on one-dimensional paper, i.e., on a tape divided into squares. I shall also suppose that the number of symbols which may be printed is finite....

"The behavior of the computer at any moment is determined by the symbols which he is observing, and his "state of mind" at that moment. We may suppose that there is a bound B to the number of symbols or squares which the computer can observe at one moment. If he wishes to observe more, he must use successive observations. We will also suppose that the number of states of mind which need be taken into account is finite...

"Let us imagine that the operations performed by the computer to be split up into 'simple operations' which are so elementary that it is not easy to imagine them further divided".[51]

Turing's reduction yields the following:

"The simple operations must therefore include:

"(a) Changes of the symbol on one of the observed squares

"(b) Changes of one of the squares observed to another square within L squares of one of the previously observed squares.

"It may be that some of these change necessarily invoke a change of state of mind. The most general single operation must therefore be taken to be one of the following:

"(A) A possible change (a) of symbol together with a possible change of state of mind.

"(B) A possible change (b) of observed squares, together with a possible change of state of mind"

"We may now construct a machine to do the work of this computer".[51]

A few years later, Turing expanded his analysis (thesis, definition) with this forceful expression of it:

"A function is said to be "effectively calculable" if its values can be found by some purely mechanical process. Although it is fairly easy to get an intuitive grasp of this idea, it is nevertheless desirable to have some more definite, mathematical expressible definition . . . [he discusses the history of the definition pretty much as presented above with respect to Gödel, Herbrand, Kleene, Church, Turing and Post] . . . We may take this statement literally, understanding by a purely mechanical process one which could be carried out by a machine. It is possible to give a mathematical description, in a certain normal form, of the structures of these machines. The development of these ideas leads to the author's definition of a computable function, and to an identification of computability † with effective calculability . . . .

"† We shall use the expression "computable function" to mean a function calculable by a machine, and we let "effectively calculable" refer to the intuitive idea without particular identification with any one of these definitions".[52]

J. B. Rosser (1939) and S. C. Kleene (1943)

J. Barkley Rosser boldly defined an 'effective [mathematical] method' in the following manner (boldface added):

"'Effective method' is used here in the rather special sense of a method each step of which is precisely determined and which is certain to produce the answer in a finite number of steps. With this special meaning, three different precise definitions have been given to date. [his footnote #5; see discussion immediately below]. The simplest of these to state (due to Post and Turing) says essentially that an effective method of solving certain sets of problems exists if one can build a machine which will then solve any problem of the set with no human intervention beyond inserting the question and (later)

reading the answer. All three definitions are equivalent, so it doesn't matter which one is used. Moreover, the fact that all three are equivalent is a very strong argument for the correctness of any one." (Rosser 1939:225–6)
Rosser's footnote #5 references the work of (1) Church and Kleene and their definition of λ-definability, in particular Church's use of it in his An Unsolvable Problem of Elementary Number Theory (1936); (2) Herbrand and Gödel and their use of recursion in particular Gödel's use in his famous paper On Formally Undecidable Propositions of Principia Mathematica and Related Systems I (1931); and (3) Post (1936) and Turing (1936–7) in their mechanism-models of computation.
Stephen C. Kleene defined as his now-famous "Thesis I" known as the Church–Turing thesis. But he did this in the following context (boldface in original):
"12. Algorithmic theories... In setting up a complete algorithmic theory, what we do is to describe a procedure, performable for each set of values of the independent variables, which procedure necessarily terminates and in such manner that from the outcome we can read a definite answer, "yes" or "no," to the question, "is the predicate value true?"" (Kleene 1943:273)
History after 1950
A number of efforts have been directed toward further refinement of the definition of "algorithm", and activity is on-going because of issues surrounding, in particular, foundations of mathematics (especially the Church–Turing thesis) and philosophy of mind (especially arguments around artificial intelligence). For more, see Algorithm characterizations.

4.1.2 Data base model

A database model is a theory or specification describing how a database is structured and used.
Several such models have been suggested.
A database model is the theoretical foundation of a database and fundamentally determines in which manner data can be stored, organized and manipulated in a database system. It thereby defines the infrastructure offered by a particular database system. The most popular example of a database model is the relational model.

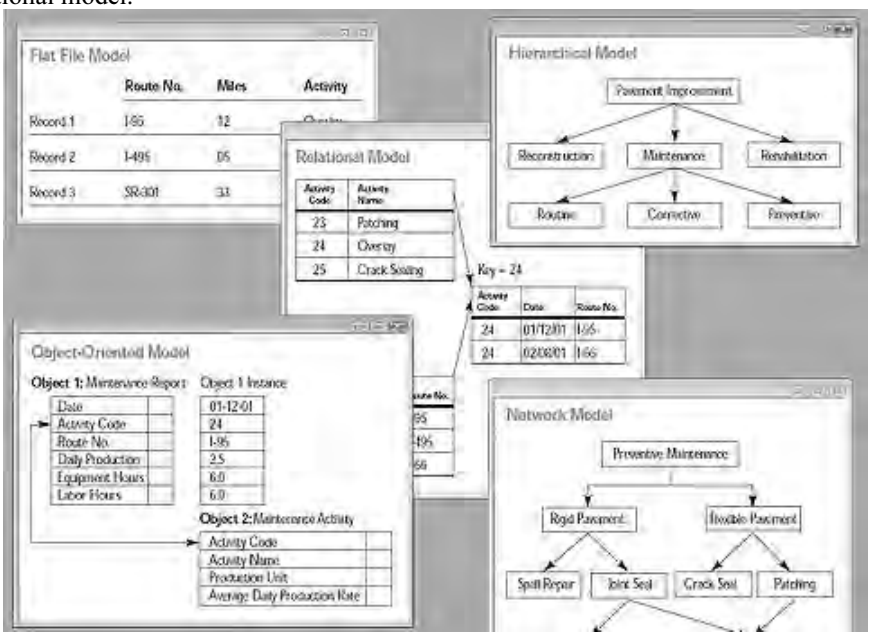


Fig. 4 Collage of five types of database models.

Common models include:

- Hierarchical model
- Network model
- Relational model
- Entity-relationship
- Object-relational model
- Object model

A data model is not just a way of structuring data: it also defines a set of operations that can be performed on the data. The relational model, for example, defines operations such as select, project, and join. Although these operations may not be explicit in a particular query language, they provide the foundation on which a query language is built.

Models

Various techniques are used to model data structure. Most database systems are built around one particular data model, although it is increasingly common for products to offer support for more than one model. For any one logical model various physical implementations may be possible, and most products will offer the user some level of control in tuning the physical implementation, since the choices that are made have a significant effect on performance. An example of this is the relational model: all serious implementations of the relational model allow the creation of indexes which provide fast access to rows in a table if the values of certain columns are known.

Flat model

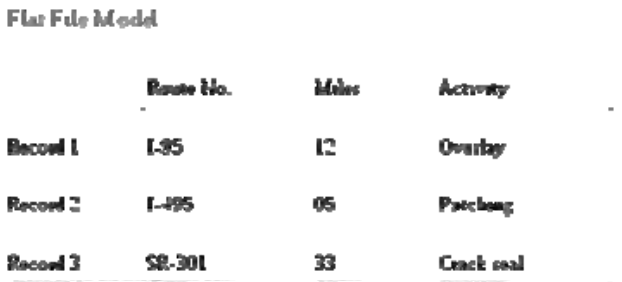


Fig. 5 Flat File Model.

The flat (or table) model consists of a single, two-dimensional array of data elements, where all members of a given column are assumed to be similar values, and all members of a row are assumed to be related to one another. For instance, columns for name and password that might be used as a part of a system security database. Each row would have the specific password associated with an individual user. Columns of the table often have a type associated with them, defining them as character data, date or time information, integers, or floating point numbers. This may not strictly qualify as a data model, as defined above.

Hierarchical model

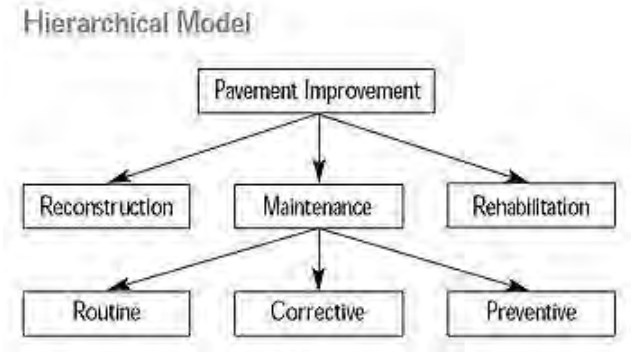


Fig. 6 Hierarchical Model.

In a hierarchical model, data is organized into a tree-like structure, implying a single upward link in each record to describe the nesting, and a sort field to keep the records in a particular order in each same-level list. Hierarchical structures were widely used in the early mainframe database management systems, such as the Information Management System (IMS) by IBM, and now describe the structure of XML documents. This structure allows one 1:N relationship between two types of data. This structure is very efficient to describe many relationships in the real world; recipes, table of contents, ordering of paragraphs/verses, any nested and sorted information. However, the hierarchical structure is inefficient for certain database operations when a full path (as opposed to upward link and sort field) is not also included for each record.
Parent–child relationship: Child may only have one parent but a parent can have multiple children. Parents and children are tied together by links called "pointers". A parent will have a list of pointers to each of their children.
Network model

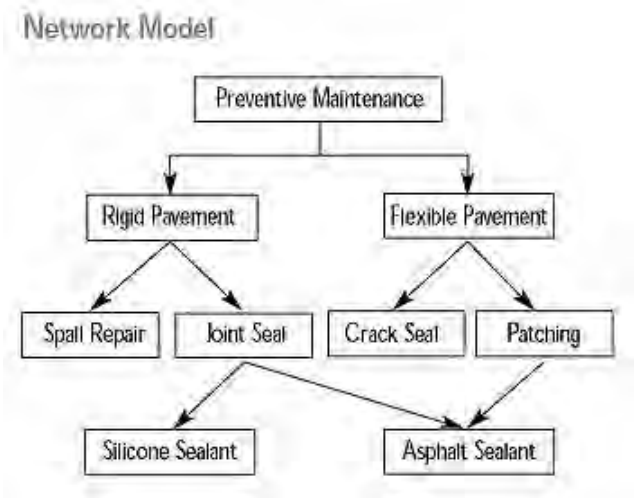


Fig. 7 Network Model.

The network model (defined by the CODASYL specification) organizes data using two fundamental constructs, called records and sets. Records contain fields (which may be organized hierarchically, as in the programming language COBOL). Sets (not to be confused with mathematical sets) define one-to-many relationships between records: one owner, many members. A record may be an owner in any number of sets, and a member in any number of sets.
The network model is a variation on the hierarchical model, to the extent that it is built on the concept of multiple branches (lower-level structures) emanating from one or more nodes (higher-level structures), while the model differs from the hierarchical model in that branches can be connected to multiple nodes. The network model is able to represent redundancy in data more efficiently than in the hierarchical model.
The operations of the network model are navigational in style: a program maintains a current position, and navigates from one record to another by following the relationships in which the record participates. Records can also be located by supplying key values.
Although it is not an essential feature of the model, network databases generally implement the set relationships by means of pointers that directly address the location of a record on disk. This gives excellent retrieval performance, at the expense of operations such as database loading and reorganization.
Most object databases use the navigational concept to provide fast navigation across networks of objects, generally using object identifiers as "smart" pointers to related objects. Objectivity/DB, for instance, implements named 1:1, 1:many, many:1 and many: many named relationships that can cross databases. Many object databases also support SQL, combining the strengths of both models.

Relational model

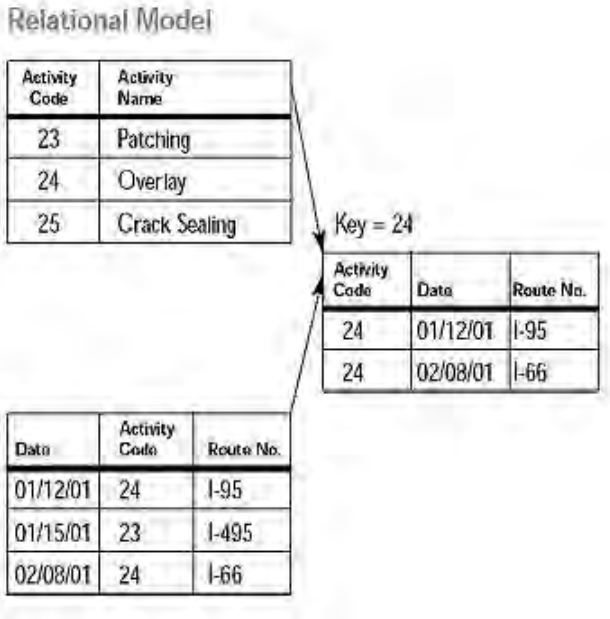


Fig. 8 Example of a Relational Model.

The relational model was introduced by E.F. Codd in 1970[1] as a way to make database management systems more independent of any particular application. It is a mathematical model defined in terms of predicate logic and set theory.

The products that are generally referred to as relational databases in fact implement a model that is only an approximation to the mathematical model defined by Codd. Three key terms are used extensively in relational database models: relations, attributes, and domains. A relation is a table with columns and rows. The named columns of the relation are called attributes, and the domain is the set of values the attributes are allowed to take.

The basic data structure of the relational model is the table, where information about a particular entity (say, an employee) is represented in rows (also called tuples) and columns. Thus, the "relation" in "relational database" refers to the various tables in the database; a relation is a set of tuples. The columns enumerate the various attributes of the entity (the employee's name, address or phone number, for example), and a row is an actual instance of the entity (a specific employee) that is represented by the relation. As a result, each tuple of the employee table represents various attributes of a single employee.

All relations (and, thus, tables) in a relational database have to adhere to some basic rules to qualify as relations. First, the ordering of columns is immaterial in a table. Second, there can't be identical tuples or rows in a table. And third, each tuple will contain a single value for each of its attributes.

A relational database contains multiple tables, each similar to the one in the "flat" database model. One of the strengths of the relational model is that, in principle, any value occurring in two different records (belonging to the same table or to different tables), implies a relationship among those two records. Yet, in order to enforce explicit integrity constraints, relationships between records in tables can also be defined explicitly, by identifying or non-identifying parent-child relationships characterized by assigning cardinality (1:1, (0)1:M, M:M). Tables can also have a designated single attribute or a set of attributes that can act as a "key", which can be used to uniquely identify each tuple in the table.

A key that can be used to uniquely identify a row in a table is called a primary key. Keys are commonly used to join or combine data from two or more tables. For example, an Employee table may contain a column named Location which contains a value that matches the key of a Location table. Keys are also critical in the creation of indexes, which facilitate fast retrieval of data from large tables.

Any column can be a key, or multiple columns can be grouped together into a compound key. It is not necessary to define all the keys in advance; a column can be used as a key even if it was not originally intended to be one.
A key that has an external, real-world meaning (such as a person's name, a book's ISBN, or a car's serial number) is sometimes called a "natural" key. If no natural key is suitable (think of the many people named Brown), an arbitrary or surrogate key can be assigned (such as by giving employees ID numbers). In practice, most databases have both generated and natural keys, because generated keys can be used internally to create links between rows that cannot break, while natural keys can be used, less reliably, for searches and for integration with other databases. (For example, records in two independently developed databases could be matched up by social security number, except when the social security numbers are incorrect, missing, or have changed.)
Dimensional model
The dimensional model is a specialized adaptation of the relational model used to represent data in data warehouses in a way that data can be easily summarized using OLAP queries. In the dimensional model, a database consists of a single large table of facts that are described using dimensions and measures. A dimension provides the context of a fact (such as who participated, when and where it happened, and its type) and is used in queries to group related facts together. Dimensions tend to be discrete and are often hierarchical; for example, the location might include the building, state, and country. A measure is a quantity describing the fact, such as revenue. It's important that measures can be meaningfully aggregated - for example, the revenue from different locations can be added together.
In an OLAP query, dimensions are chosen and the facts are grouped and added together to create a summary.
The dimensional model is often implemented on top of the relational model using a star schema, consisting of one table containing the facts and surrounding tables containing the dimensions. Particularly complicated dimensions might be represented using multiple tables, resulting in a snowflake schema.
A data warehouse can contain multiple star schemas that share dimension tables, allowing them to be used together. Coming up with a standard set of dimensions is an important part of dimensional modeling.

Objectional database models

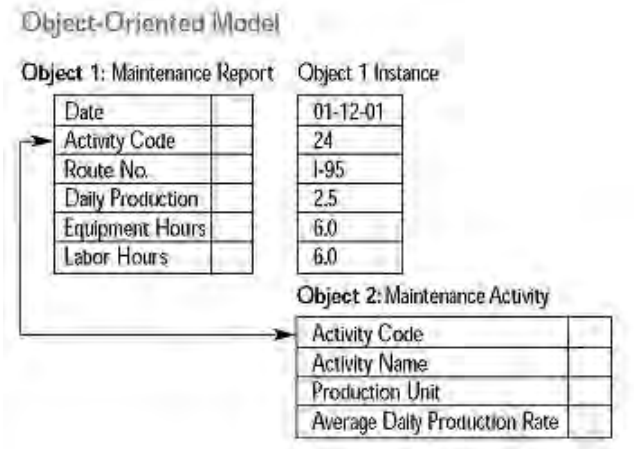


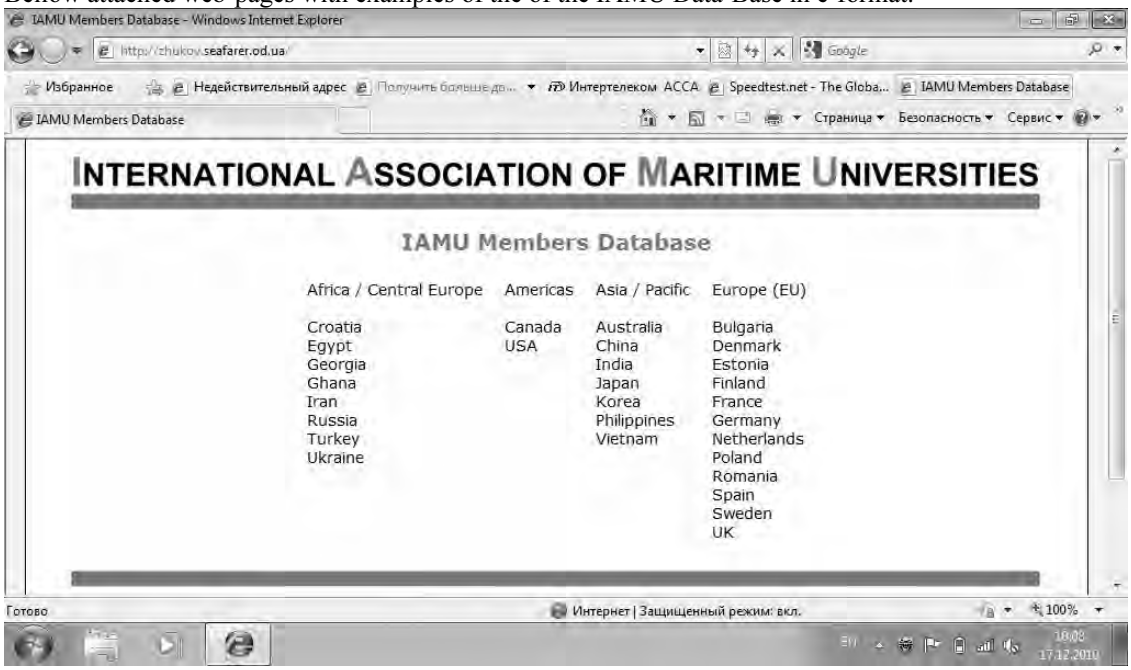
Fig. 9 Example of a Object-Oriented Model.

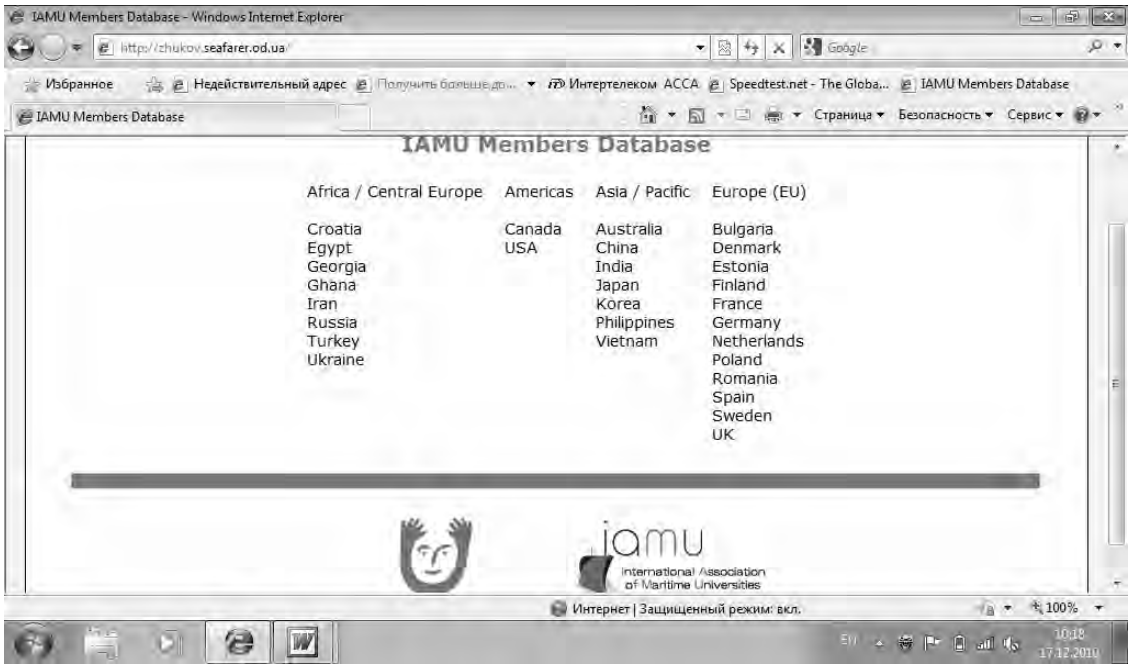
In recent years, the object-oriented paradigm has been applied to database technology, creating a new programming model known as object databases. These databases attempt to bring the database world and the application programming world closer together, in particular by ensuring that the database uses the same type system as the application program. This aims to avoid the overhead (sometimes referred to as the impedance mismatch) of converting information between its representation in the database (for example as rows in tables) and its representation in the application program (typically as

objects). At the same time, object databases attempt to introduce the key ideas of object programming, such as encapsulation and polymorphism, into the world of databases.
A variety of these ways have been tried for storing objects in a database. Some products have approached the problem from the application programming end, by making the objects manipulated by the program persistent. This also typically requires the addition of some kind of query language, since conventional programming languages do not have the ability to find objects based on their information content. Others have attacked the problem from the database end, by defining an object-oriented data model for the database, and defining a database programming language that allows full programming capabilities as well as traditional query facilities.
Object databases suffered because of a lack of standardization: although standards were defined by ODMG, they were never implemented well enough to ensure interoperability between products. Nevertheless, object databases have been used successfully in many applications: usually specialized applications such as engineering databases or molecular biology databases rather than mainstream commercial data processing. However, object database ideas were picked up by the relational vendors and influenced extensions made to these products and indeed to the SQL language.

4.1.3 IAMU Database Model in e-format

IAMU DATA BASE web-address: http://zhukov.seafarer.od.ua/
Bellow attached web-pages with examples of the of the IAMU Data-Base in e-format.




IAMU Members Database - Windows Internet Explorer
IAMU Members Database
IAMU Members Database
Africa / Central Europe
Croatia
Egypt
Georgia
Ghana
Iran
Russia
Turkey
Ukraine
Americas
Canada
USA
Asia / Pacific
Australia
China
India
Japan
Korea
Philippines
Vietnam
Europe (EU)
Bulgaria
Denmark
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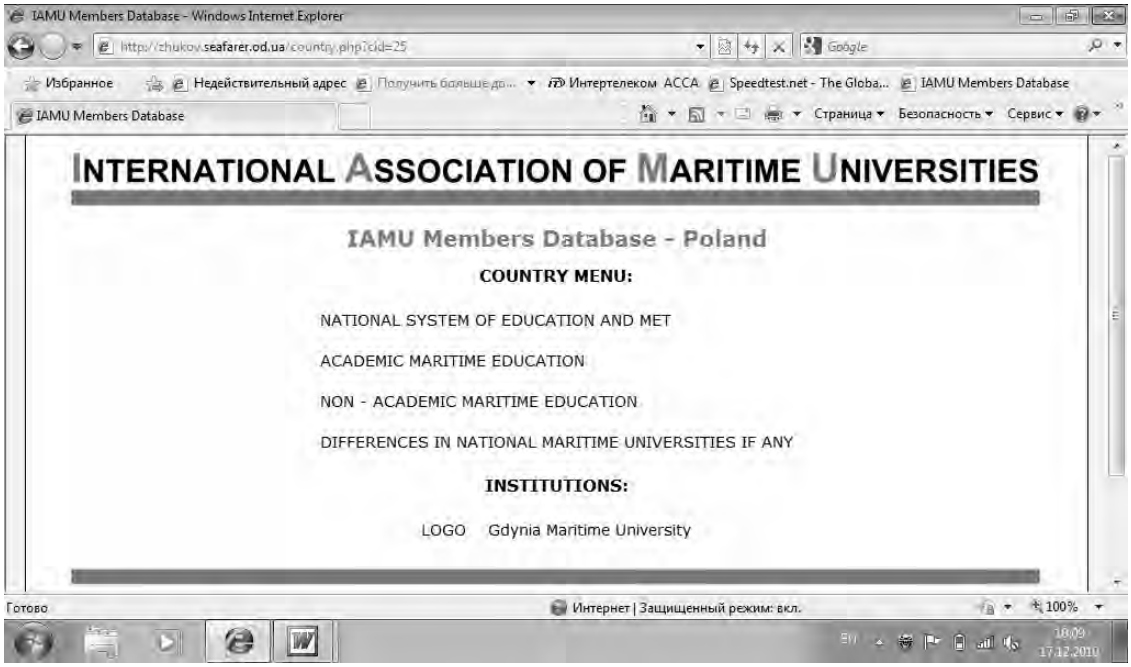
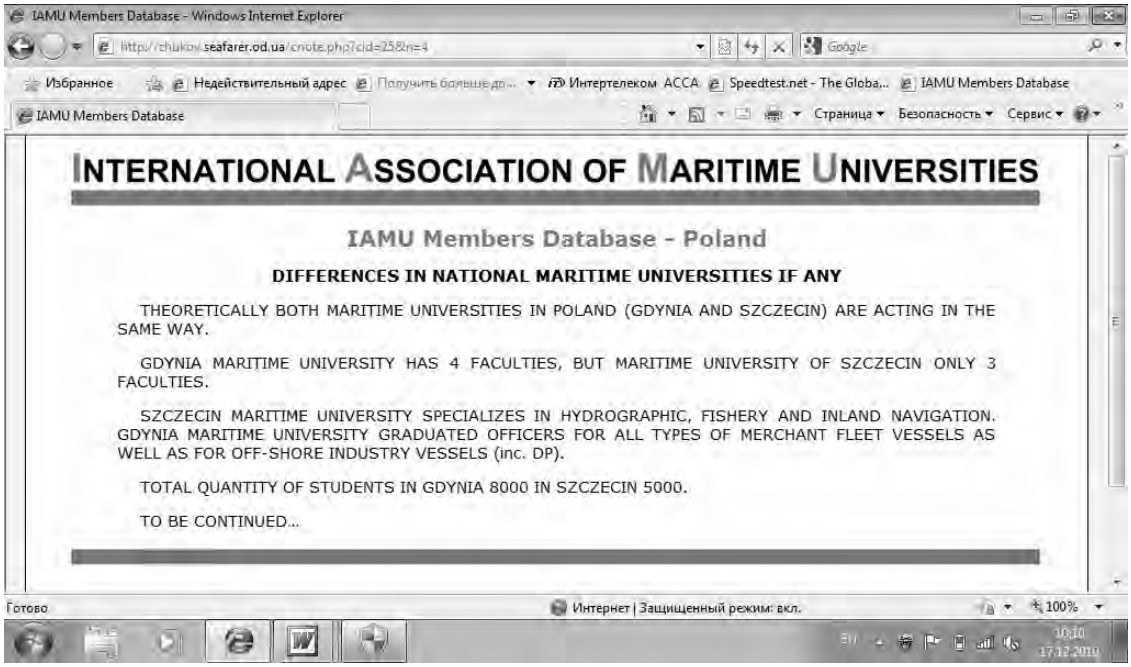
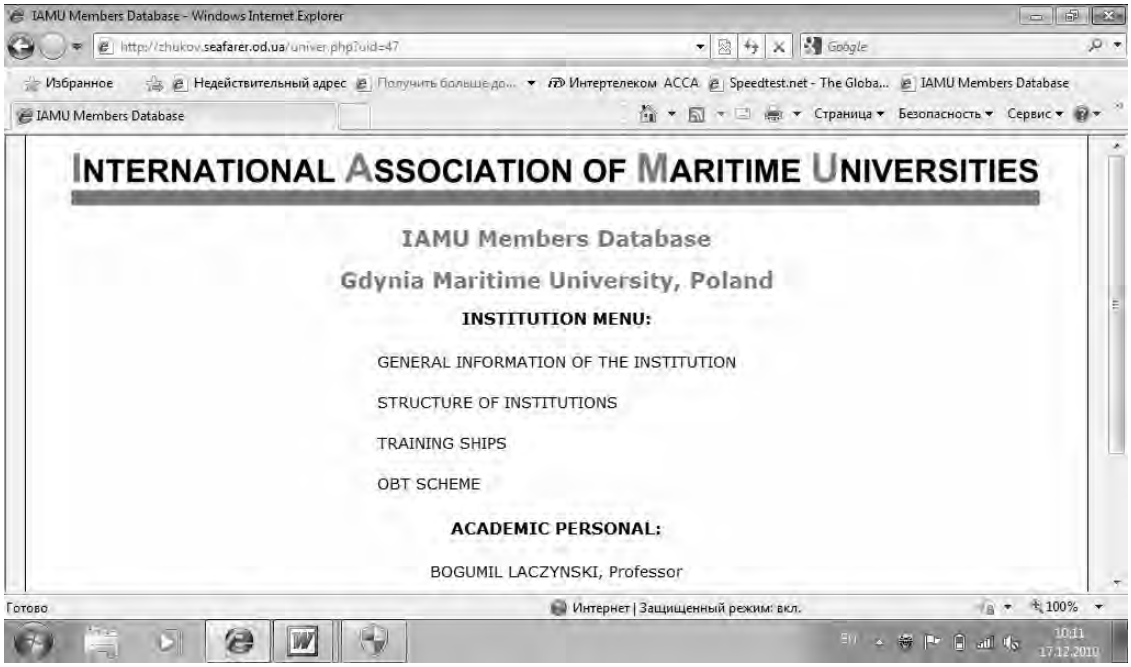
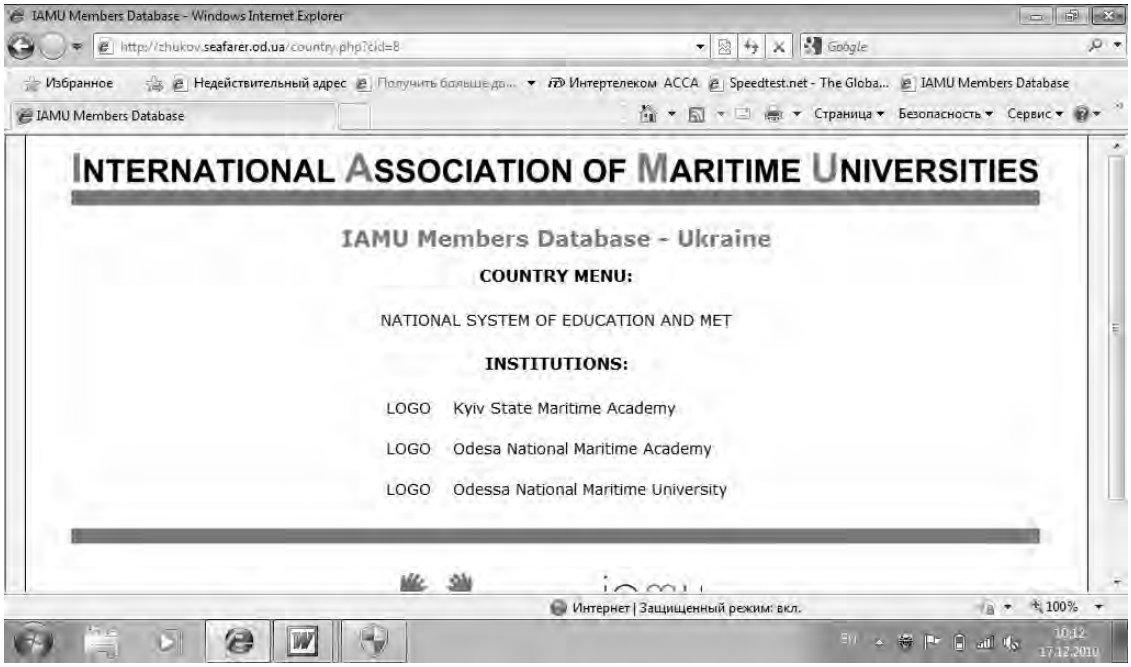
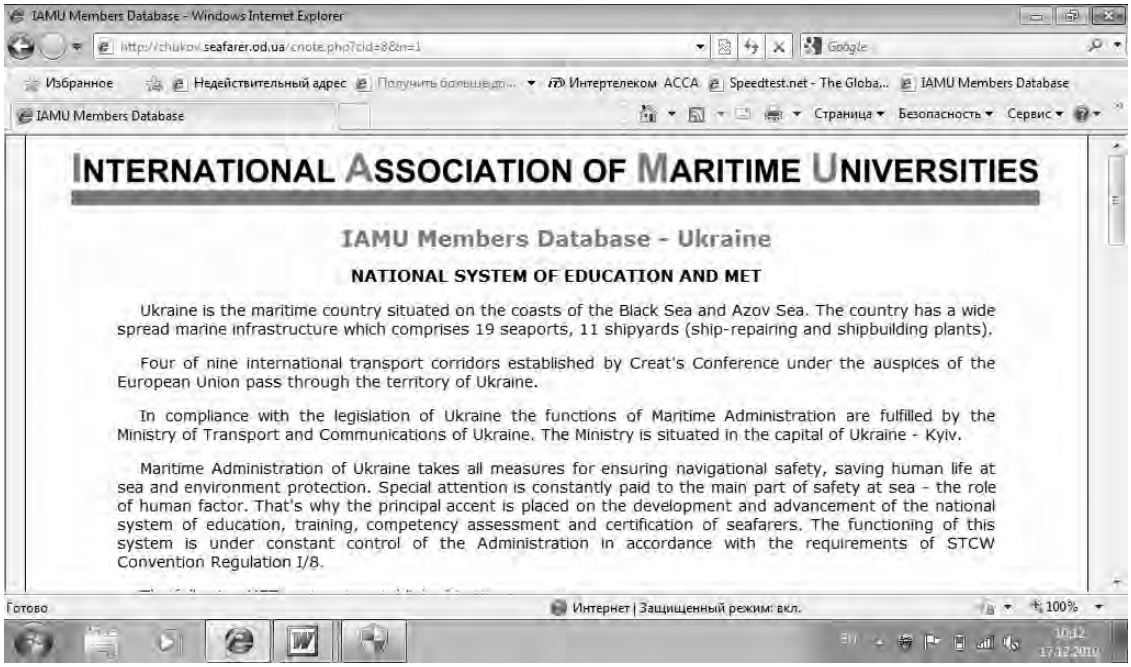
Finland
France
Germany
Netherlands
Poland
Romania
Spain
Sweden
UK
iamu
International Association of Maritime Universities

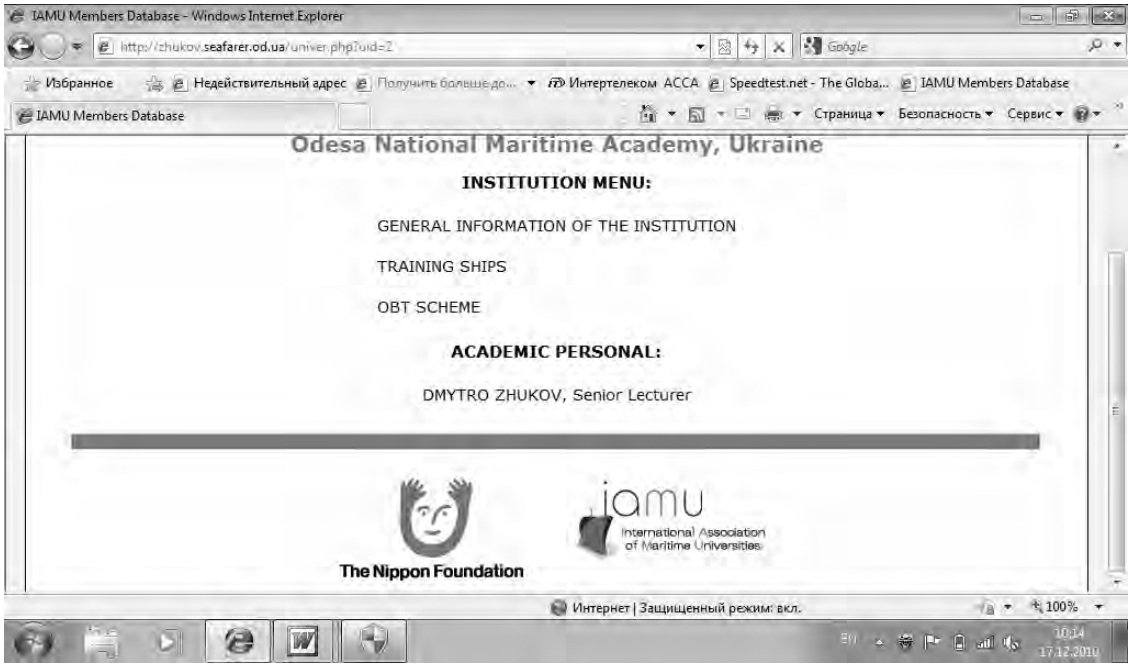

IAMU Members Database - Windows Internet Explorer
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database - Poland
COUNTRY MENU:
NATIONAL SYSTEM OF EDUCATION AND MET
ACADEMIC MARITIME EDUCATION
NON - ACADEMIC MARITIME EDUCATION
DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY
INSTITUTIONS:
LOGO Gdynia Maritime University


IAMU Members Database - Windows Internet Explorer
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database - Poland
DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY
THEORETICALLY BOTH MARITIME UNIVERSITIES IN POLAND (GDYNIA AND SZCZECIN) ARE ACTING IN THE SAME WAY.
GDYNIA MARITIME UNIVERSITY HAS 4 FACULTIES, BUT MARITIME UNIVERSITY OF SZCZECIN ONLY 3 FACULTIES.
SZCZECIN MARITIME UNIVERSITY SPECIALIZES IN HYDROGRAPHIC, FISHERY AND INLAND NAVIGATION. GDYNIA MARITIME UNIVERSITY GRADUATED OFFICERS FOR ALL TYPES OF MERCHANT FLEET VESSELS AS WELL AS FOR OFF-SHORE INDUSTRY VESSELS (inc. DP).
TOTAL QUANTITY OF STUDENTS IN GDYNIA 8000 IN SZCZECIN 5000.
TO BE CONTINUED...


IAMU Members Database - Windows Internet Explorer
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database
Gdynia Maritime University, Poland
INSTITUTION MENU:
GENERAL INFORMATION OF THE INSTITUTION
STRUCTURE OF INSTITUTIONS
TRAINING SHIPS
OBT SCHEME
ACADEMIC PERSONAL:
BOGUMIL LACZYNSKI, Professor


IAMU Members Database - Windows Internet Explorer
http://zhukov.seafarer.od.ua/country.php?cid=8
IAMU Members Database
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database - Ukraine
COUNTRY MENU:
NATIONAL SYSTEM OF EDUCATION AND MET
INSTITUTIONS:
LOGO Kyiv State Maritime Academy
LOGO Odesa National Maritime Academy
LOGO Odessa National Maritime University


IAMU Members Database - Windows Internet Explorer
http://zhukov.seafarer.od.ua/cnote.php?cid=8&n=1
IAMU Members Database
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database - Ukraine
NATIONAL SYSTEM OF EDUCATION AND MET
Ukraine is the maritime country situated on the coasts of the Black Sea and Azov Sea. The country has a wide spread marine infrastructure which comprises 19 seaports, 11 shipyards (ship-repairing and shipbuilding plants).
Four of nine international transport corridors established by Creat's Conference under the auspices of the European Union pass through the territory of Ukraine.
In compliance with the legislation of Ukraine the functions of Maritime Administration are fulfilled by the Ministry of Transport and Communications of Ukraine. The Ministry is situated in the capital of Ukraine - Kyiv.
Maritime Administration of Ukraine takes all measures for ensuring navigational safety, saving human life at sea and environment protection. Special attention is constantly paid to the main part of safety at sea - the role of human factor. That's why the principal accent is placed on the development and advancement of the national system of education, training, competency assessment and certification of seafarers. The functioning of this system is under constant control of the Administration in accordance with the requirements of STCW Convention Regulation I/8.


IAMU Members Database - Windows Internet Explorer
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Избранное
Недействительный адрес
Получить больше до...
Интертелеком ACCA
Speedtest.net - The Globa...
IAMU Members Database
Страница
Безопасность
Сервис
Odesa National Maritime Academy, Ukraine
INSTITUTION MENU:
GENERAL INFORMATION OF THE INSTITUTION
TRAINING SHIPS
OBT SCHEME
ACADEMIC PERSONAL:
DMYTRO ZHUKOV, Senior Lecturer
The Nippon Foundation
iamu
International Association of Maritime Universities
Интернет | Защищенный режим: вкл.
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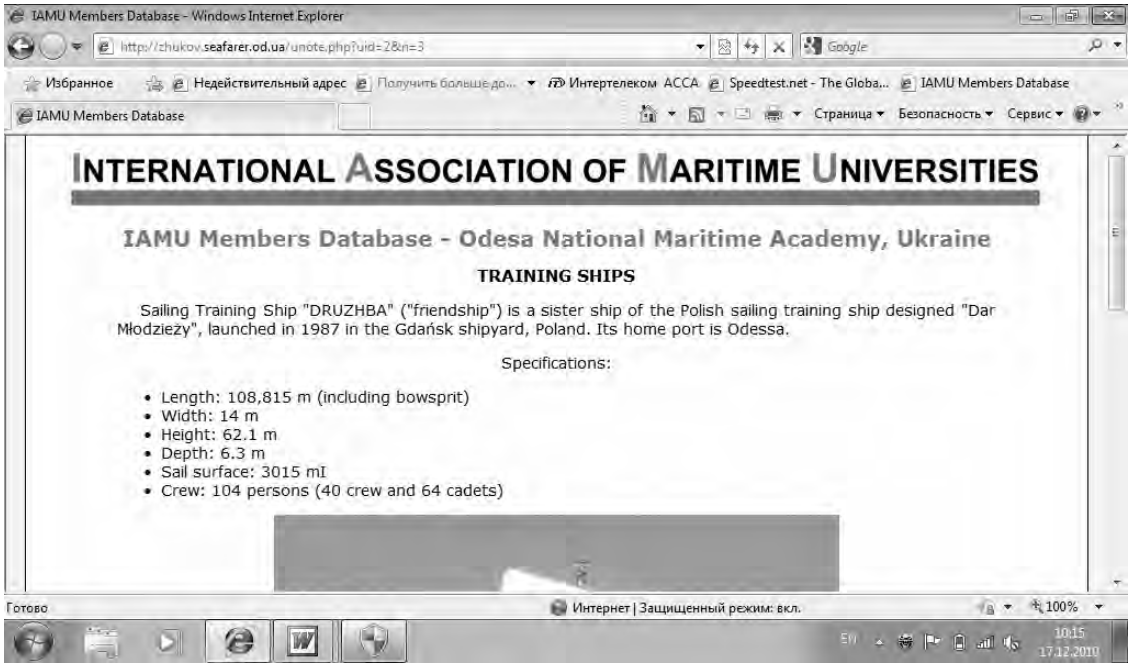
IAMU Members Database - Windows Internet Explorer
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Избранное
Недействительный адрес
Получить больше до...
Интертелеком ACCA
Speedtest.net - The Globa...
IAMU Members Database
Страница
Безопасность
Сервис
INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES
IAMU Members Database - Odesa National Maritime Academy, Ukraine
TRAINING SHIPS
Sailing Training Ship "DRUZHBA" ("friendship") is a sister ship of the Polish sailing training ship designed "Dar Młodzieży", launched in 1987 in the Gdańsk shipyard, Poland. Its home port is Odessa.
Specifications:
Length: 108,815 m (including bowsprit)
Width: 14 m
Height: 62.1 m
Depth: 6.3 m
Sail surface: 3015 mI
Crew: 104 persons (40 crew and 64 cadets)
Готово
Интернет | Защищенный режим: вкл.
100%

References

1. (1959) On a Subrecursive Hierarchy and Primitive Recursive Degrees, Transactions of the American Mathematical Society 92, pp. 85–105
2. Bell, C. Gordon and Newell, Allen (1971), Computer Structures: Readings and Examples, McGraw-Hill Book Company, New York. ISBN 0-07-004357-4}.
3. Blass, Andreas; Gurevich, Yuri (2003). "Algorithms: A Quest for Absolute Definitions". Bulletin of European Association for Theoretical Computer Science 81. http://research.microsoft.com/~gurevich/Opera/164.pdf. Includes an excellent bibliography of 56 references.
4. Boolos, George; Jeffrey, Richard (1974, 1980, 1989, 1999). Computability and Logic (4th ed.). Cambridge University Press, London. ISBN 0-521-20402-X.: cf. Chapter 3 Turing machines where they discuss "certain enumerable sets not effectively (mechanically) enumerable".
5. Burgin, M. Super-recursive algorithms, Monographs in computer science, Springer, 2005. ISBN 0-387-95569-0
6. Campagnolo, M.L., Moore, C., and Costa, J.F. (2000) An analog characterization of the subrecursive functions. In Proc. of the 4th Conference on Real Numbers and Computers, Odense University, pp. 91–109
7. Church, Alonzo (1936a). "An Unsolvable Problem of Elementary Number Theory". The American Journal of Mathematics 58 (2): 345–363. doi:10.2307/2371045. http://jstor.org/stable/2371045. Reprinted in The Undecidable, p. 89ff. The first expression of "Church's Thesis". See in particular page 100 (The Undecidable) where he defines the notion of "effective calculability" in terms of "an algorithm", and he uses the word "terminates", etc.
8. Church, Alonzo (1936b). "A Note on the Entscheidungsproblem". The Journal of Symbolic Logic 1 (1): 40–41. doi:10.2307/2269326. http://jstor.org/stable/2269326. Church, Alonzo (1936). "Correction to a Note on the Entscheidungsproblem". The Journal of Symbolic Logic 1 (3): 101–102. doi:10.2307/2269030. http://jstor.org/stable/2269030. Reprinted in The Undecidable, p. 110ff. Church shows that the Entscheidungsproblem is unsolvable in about 3 pages of text and 3 pages of footnotes.
9. Daffa', Ali Abdullah al- (1977). The Muslim contribution to mathematics. London: Croom Helm. ISBN 0-85664-464-1.
10. Davis, Martin (1965). The Undecidable: Basic Papers On Undecidable Propositions, Unsolvable Problems and Computable Functions. New York: Raven Press. ISBN 0486432289. Davis gives commentary before each article. Papers of Gödel, Alonzo Church, Turing, Rosser, Kleene, and Emil Post are included; those cited in the article are listed here by author's name.
11. Davis, Martin (2000). Engines of Logic: Mathematicians and the Origin of the Computer. New York: W. W. Nortion. ISBN 0393322297. Davis offers concise biographies of Leibniz, Boole, Frege, Cantor, Hilbert, Gödel and Turing with von Neumann as the show-stealing villain. Very brief bios of Joseph-Marie Jacquard, Babbage, Ada Lovelace, Claude Shannon, Howard Aiken, etc.
12. This article incorporates public domain material from the NIST document "algorithm" by Paul E. Black (Dictionary of Algorithms and Data Structures).
13. Dennett, Daniel (1995). Darwin's Dangerous Idea. New York: Touchstone/Simon & Schuster. ISBN 0684802902.
14. Yuri Gurevich, Sequential Abstract State Machines Capture Sequential Algorithms, ACM Transactions on Computational Logic, Vol 1, no 1 (July 2000), pages 77–111. Includes bibliography of 33 sources.
15. Kleene C., Stephen (1936). "General Recursive Functions of Natural Numbers". Mathematische Annalen 112 (5): 727–742. doi:10.1007/BF01565439. Presented to the American Mathematical Society, September 1935. Reprinted in The Undecidable, p. 237ff. Kleene's definition of "general recursion" (known now as mu-recursion) was used by Church in his 1935 paper An Unsolvable Problem of Elementary Number Theory that proved the "decision problem" to be "undecidable" (i.e., a negative result).

16. Kleene C., Stephen (1943). "Recursive Predicates and Quantifiers". American Mathematical Society Transactions 54 (1): 41–73. doi:10.2307/1990131. http://jstor.org/stable/1990131. Reprinted in The Undecidable, p. 255ff. Kleene refined his definition of "general recursion" and proceeded in his chapter "12. Algorithmic theories" to posit "Thesis I" (p. 274); he would later repeat this thesis (in Kleene 1952:300) and name it "Church's Thesis"(Kleene 1952:317) (i.e., the Church thesis).
17. Kleene, Stephen C. (First Edition 1952). Introduction to Metamathematics (Tenth Edition 1991 ed.). North-Holland Publishing Company. ISBN 0720421039. Excellent—accessible, readable—reference source for mathematical "foundations".
18. Knuth, Donald (1997). Fundamental Algorithms, Third Edition. Reading, Massachusetts: Addison–Wesley. ISBN 0201896834.
19. Kosovsky, N. K. Elements of Mathematical Logic and its Application to the theory of Subrecursive Algorithms, LSU Publ., Leningrad, 1981
20. Kowalski, Robert (1979). "Algorithm=Logic+Control". Communications of the ACM 22 (7): 424–436. doi:10.1145/359131.359136. ISSN 0001-0782.
21. A. A. Markov (1954) Theory of algorithms. [Translated by Jacques J. Schorr-Kon and PST staff] Imprint Moscow, Academy of Sciences of the USSR, 1954 [i.e., Jerusalem, Israel Program for Scientific Translations, 1961; available from the Office of Technical Services, U.S. Dept. of Commerce, Washington] Description 444 p. 28 cm. Added t.p. in Russian Translation of Works of the Mathematical Institute, Academy of Sciences of the USSR, v. 42. Original title: Teoriya algerifmov. [QA248.M2943 Dartmouth College library. U.S. Dept. of Commerce, Office of Technical Services, number OTS 60-51085.]
22. Minsky, Marvin (1967). Computation: Finite and Infinite Machines (First ed.). Prentice-Hall, Englewood Cliffs, NJ. ISBN 0131654497. Minsky expands his "...idea of an algorithm—an effective procedure..." in chapter 5.1 Computability, Effective Procedures and Algorithms. Infinite machines."
23. Post, Emil (1936). "Finite Combinatory Processes, Formulation I". The Journal of Symbolic Logic 1 (3): 103–105. doi:10.2307/2269031. http://jstor.org/stable/2269031. Reprinted in The Undecidable, p. 289ff. Post defines a simple algorithmic-like process of a man writing marks or erasing marks and going from box to box and eventually halting, as he follows a list of simple instructions. This is cited by Kleene as one source of his "Thesis I", the so-called Church–Turing thesis.
24. Rosser, J.B. (1939). "An Informal Exposition of Proofs of Godel's Theorem and Church's Theorem". Journal of Symbolic Logic 4. Reprinted in The Undecidable, p. 223ff. Herein is Rosser's famous definition of "effective method": "...a method each step of which is precisely predetermined and which is certain to produce the answer in a finite number of steps... a machine which will then solve any problem of the set with no human intervention beyond inserting the question and (later) reading the answer" (p. 225–226, The Undecidable)
25. Sipser, Michael (2006). Introduction to the Theory of Computation. PWS Publishing Company. ISBN 053494728X.
26. Stone, Harold S. (1972). Introduction to Computer Organization and Data Structures (1972 ed.). McGraw-Hill, New York. ISBN 0070617260. Cf. in particular the first chapter titled: Algorithms, Turing Machines, and Programs. His succinct informal definition: "...any sequence of instructions that can be obeyed by a robot, is called an algorithm" (p. 4).
27. Turing, Alan M. (1936–7). "On Computable Numbers, With An Application to the Entscheidungsproblem". Proceedings of the London Mathematical Society, Series 2 42: 230–265. doi:10.1112/plms/s2-42.1.230.. Corrections, ibid, vol. 43(1937) pp. 544–546. Reprinted in The Undecidable, p. 116ff. Turing's famous paper completed as a Master's dissertation while at King's College Cambridge UK.
28. Turing, Alan M. (1939). "Systems of Logic Based on Ordinals". Proceedings of the London Mathematical Society, Series 2 45: 161–228. doi:10.1112/plms/s2-45.1.161. Reprinted in The Undecidable, p. 155ff. Turing's paper that defined "the oracle" was his PhD thesis while at Princeton USA.
29. United States Patent and Trademark Office (2006), 2106.02 **>Mathematical Algorithms< - 2100 Patentability, Manual of Patent Examining Procedure (MPEP). Latest revision August 2006

5. Appendix

5.1 Project Meeting Minutes

5.1.1 Project Meeting # 1Minutes

15 -17 August 2010
Odessa National Maritime Academy
Venue: Odessa National Maritime Academy, Room 220

Project Title: "Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions"

Project Meeting Participants:

Prof. M. Miyusov, ONMA Rector
Prof. M. Tsimbal, Dean maritime Navigation Faculty, ONMA
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, Kobe University, Graduate School of Maritime Sciences
Professor Bogumil Laczynski, Gdynia Maritime University

Project Questionnaire and Project Flow – Chart Algorithm have been prepared by Meeting Participants.
In accordance with prepared Questionnaires and Flow – Chart Algorithm by Meeting participants it is agreed to prepare Pilot information about their Maritime Universities (ONMA, KU GSMS and GMU). After comparing and correcting, these materials should be sent by e-mail to IAMU Members by the 30th of September 2010. Also this pilot information together with Questionnaires and Flow – Chart Algorithm should be printed in small booklet form and distributed during AGA 11 in Korea Maritime University to all IAMU delegates, 15-17 October 2010. Every IAMU Member kindly ask to appoint a contact person for this project, fill in and send the necessary forms to Project Coordinator by the 30th of November 2010. At the middle of December 2010 Project's participants have to organize meeting to analyze obtained information from IAMU Members. Additional meeting may be required at the end of the January 2011.

Final analyse of the materials will be published in 60 copies by the 28th of February 2011.

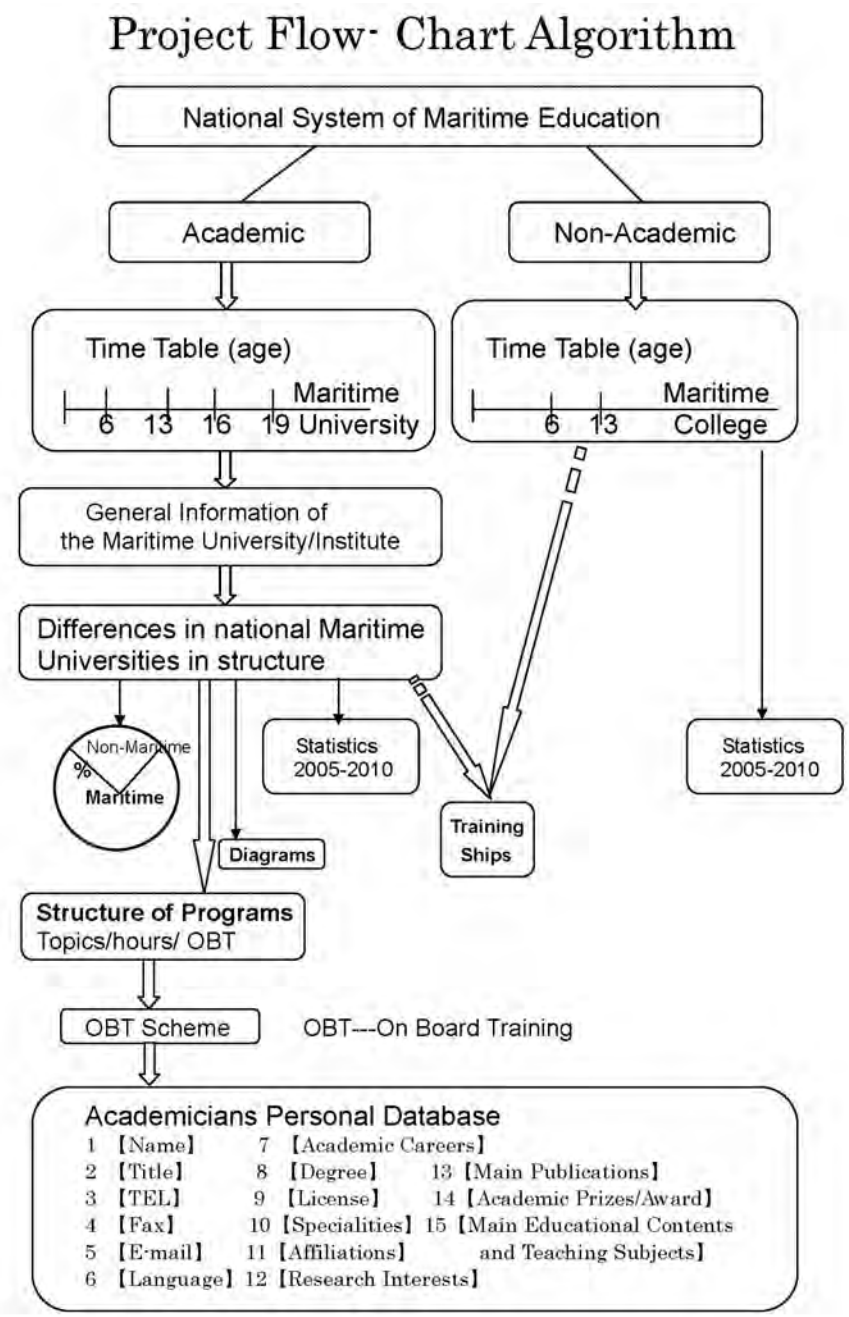


Fig. 1 Project's collecting information Algorithm

Project Questionnaire:

6. National system of the education and MET in the Country.
7. General information of the Institution
   - Name of the Institution:
     President:
     Address:

Phone/fax numbers:
Fax:
URL:

- Structure of the Institution
- Teaching Staff Total quantity (Professor, PHD, Lecturers, Instructor)
  - Name
  - Title
  - TEL
  - FAX
  - E-mail
  - Language
  - Academic Careers
  - Degree
  - License
  - Specialities
  - Affiliations
  - Research Interests
  - Main Publications
  - Academic Prizes/Award
  - Main Educational Contents and Teaching Subjects
- Students/Cadets total quantity and separate by Faculties

8. Structure of Programs(Topics/Hours/OBT)
9. Training ship, if yes please insert particulars.
10. OBT Scheme

5.1.2 Project Meeting # 2 Minutes

16.10.2010
Korea Maritime University
Venue: Korea Maritime University, International Meeting Room

Project Title: "Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions"

Project Participants Meeting
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, KU GSMS
Professor Bogumil Laczynski, GMU
Associate Professor Xu Bin, DMU
Professor Jin Soo Park, KMU

During the Meeting was discused the Project Algorithm and Questionaire.
Capt. D. Zhukov presented to Meeting Partisipant PPT Presentation"Research on algorithm of collecting valuable information MET system and Human Resource Database in IAMU Members Universities/Institution". This PPT Presentation was present to all AGA 11 delegates on the last day of AGA 11.
It was mentioned that without support from all IAMU Members it's impossible to complete IAMU Database.

5.1.3 Project Meeting # 3 (Final Meeting) Minutes

16 -18 December 2010
Gdynia Maritime University
Venue: Radisson Blu Hotel
Gdynia Maritime University Room 129

Project Title: “Research of algorithm of collect valuable information MET system IAMU Members Institution and Human Resource Database in IAMU member Universities/Institutions”

Participants Meeting
Professor Romuald Cwilewich, GMU Rector
Professor Adam Weintrit, Dean Navigational Faculty, GMU
Capt. Dmytro Zhukov, ONMA
Professor Masao Furusho, KU GSMS
Professor Bogumil Laczynski, GMU

Support staff:
Joanna Mollin, GMU
Anjey Starosta, GMU

During Project meeting were analyze and discuse the Project Results.
It was mentioned that all Project work has done in accordance with Project Shcedule.

There are 54 IAMU members University/Institution:

Region 1 (Asia/Pacific)
AMET University (India)
Australian Maritime College (Australia)
Dalian Maritime University (China)
Jimei University (China)
John B.Lacson Foundation Maritime Univirsity (Philippines)
Kobe University, Graduate School of Maritime Sciences (Japan)
Korea Maritime University (Korea)
Mokpo National Maritime University (Korea)
Shanghai Maritime University (China)
Tianjin University of Technology (China)
Tokyo University of Marine Science and Technology, Faculty of Marine Technology(Japan)
University of Transport in Ho Chi Minh City(Vietnam)
Vietnam Maritime University (Vietnam)

Region 2 (Europe(EU))
Constanta Maritime University(Romania)
Danish Maritime University(Denmark)
Ecole Nationale de la Marine Marchande de Marseille (France)
Estonian Maritime Academy(Estonia)
Gdynia Maritime University (Poland)
Liverpool John Moores University (UK)
Hochschule Wismar, University of Applied Sciences - Technology, Business and Design (Germany)
Maritime Institute Willem Barentsz of the Northern University of Professional Education Leeuwarden(Netherlands)
Nicola Y. Vaptsarov Naval Academy(Bulgaria)
Polytechnical University of Catalonia, Faculty of Nautical Studies (Spain)
Satakunta University of Applied Sciences(Finland)
Southampton Solent University(UK)
Szczecin Maritime University (Poland)
University of Applied Sciences Oldenburg/Ostfriesland/Wilmshaven, Department of Maritime Studies(Germany)
University of Cantabria - Escuela Tecnica Superior de Nautica (Spain)
Wismar University of Technology, Business and Design (Germany)
World Maritime University (Sweden)

Region 3 (Americas)
Fisheries and Marine Institute of Memorial University of Newfoundland (FMIMUN)
Maine Maritime Academy (USA)
Massachusetts Maritime Academy (USA)
State University of New York Maritime College (USA)
Texas A&M University at Galveston (USA)
The California Maritime Academy (USA)
US Merchant Marine Academy (USA)

Region 4 (Africa/Central Europe)
Admiral Makarov State Maritime Academy (Russia)
Admiral Ushakov Maritime StateAcademy (Russia)
Arab Academy for Science & Technology and Maritime Transport(Egypt)
Baltic Fishing Fleet State Academy (Russia)
Batumi State Maritime Academy(Georgia)
Dokuz Eylul University, Maritime Faculty(Turkey)
Far Eastern State Technical Fisheries University/ Dalrybvtuz (Russia)
IRISL Maritime Training Institute (Iran)
Istanbul Technical University, Maritime Faculty (Turkey)
Karadeniz Technical University,Faculty of Marine Science (Turkey)
Kyiv State Maritime Academy (Ukraine)
Maritime State University named after Admiral G.I. Nevelskoy(Russia)
Odesa National Maritime Academy (Ukraine)
Odessa National Maritime University(Ukraine)
Regional Maritime University(Ghana)
University of Rijeka, Faculty of Maritime Studies(Croatia)

Special Member
The Nippon Foundation(Japan)

We have received 13 reports with necessary information from following IAMU members :

Region 1 (Asia/Pacific)
Kobe University, Graduate School of Maritime Sciences (Japan), prepared by Prof. Furusho
Tokyo University of Marine Science and Technology, Faculty of Marine Technology(Japan)(Joint report with Kobe University, Graduate School of Maritime Sciences)

Region 2 (Europe(EU))
Gdynia Maritime University (Poland), prepared by Prof. Laczynski
Polytechnical University of Catalonia, Faculty of Nautical Studies (Spain),
prepared by Prof. De Melo
Szczecin Maritime University (Poland)(Joint report with Gdynia Maritime University)

Region 3 (Americas)

Region 4 (Africa/Central Europe)
Admiral Makarov State Maritime Academy (Russia), prepared by Ms. Kozlova
Admiral Ushakov Maritime StateAcademy (Russia), prepared by Prof. Faivisovich
Batumi State Maritime Academy(Georgia), prepared by Prof. Gegenava
Istanbul Technical University, Maritime Faculty (Turkey), prepared by Prof. Güller
Karadeniz Technical University,Faculty of Marine Science (Turkey), prepared by Prof. Duzgunes
Kyiv State Maritime Academy (Ukraine), prepared by Prof. Nosovskyy
Odessa National Maritime Academy (Ukraine), prepared by Capt. Zhukov
University of Rijeka, Faculty of Maritime Studies(Croatia), prepared by Prof. Pritchard

Response ratio is:

13 / 54 x 100% = 24%

24% response ratio(quarter of all IAMU Members) – is a very good result for such short time term of the collecting MET information.

During the Meeting the e-version of the Project Database was presented by D. Zhukov.
Web-address of the database is http://zhukov.seafarer.od.ua/
All above information, reseived from IAMU members will be inserting in e-version of the IAMU databases.
Few response from IAMU Members were very disappointed with capacity of the work of the prepare such MET information for IAMU Database.

Meetings participants noted that it is necesary to istablish more productive system of the collecting information for the Fase 2 of the Project fo IAMU FY2011. Region coordinators should organize necessary quantity of the bisness trips for collecting MET information from region institutions.
Project participants kindly ask IAMU IEB to determine the time period of the upgrading IAMU Database information and recommend all IAMU Members to appoint the responsible person for future collecting and upgrade IAMU information.
It was noted that all future information should be prepared by responsible persons from IAMU Members in accordance with "Proposed format of the collecting information" (Sea Para 5.2.12).

5.2 Database information

5.2.1 Kobe University, Graduate School of Maritime Sciences (Japan)

1. GENERAL INFORMATION OF THE INSTITUTION

Kobe University, in recognition of its particular mission and responsibility to the people of Japan as a national university, as well as its social, historical and regional roles as an institution of higher education, hereby adopts this Kobe University Charter on Education.

Educational Philosophy : In order to contribute to the advancement of learning, happiness of humankind, preservation of the global environment and to world peace, Kobe University establishes as its fundamental educational philosophy the provision of education meeting the highest of international standards at both the undergraduate and graduate levels.

Educational Principle: In order to help students realize their individual goals, become responsible members of society, and develop to their full potential, Kobe University adopts as its basic educational principle the provision of education which emphasizes individuality and diversity while respecting the independence and autonomy of each student.

Educational Goals: Based on the above Philosophy and Principle, Kobe University, taking full advantage of the open and cosmopolitan environment in which it is located, will provide education in keeping with the following objectives:

(1) Education of Whole Person: To foster individuals who have high ethical standards, a good balance of intellect, reason and emotion, and rich understanding of culture and humanity.

(2) Education to Promote Originality: To foster individuals capable of passing on traditional thought and methodology from a critical perspective, while at the same time having ability to creatively set and fulfill new goals.

(3) Education to Promote International Awareness: To foster individuals who have an appreciation for diverse values, deep understanding of other cultures and excellent communication skills.

(4) Education to Promote Expertise: To foster individuals who have deep knowledge and ability to fulfill leadership roles in their professional and/or academic fields.

Educational Structure: Responsibility for fulfilling the above Educational Philosophy, Principle and Goals will be shared within a university-wide structure.

Evaluation: In order to determine the extent to which the above Educational Philosophy, Principle and Goals are being fulfilled, Kobe University will conduct regular assessments and evaluations, and continuously striving for improvement.

Brief history: Kobe University's inception can be traced back to March 1902 with the establishment of Kobe Higher Commercial School. In April 1929, the School was renamed Kobe University of Commerce, and in October 1944, it became Kobe University of Economics. In May 1949, Hyogo Normal School, Hyogo Junior Normal School, Kobe Technical College, Himeji High School, and Kobe University of Economics were brought together to form Kobe University. In the initial stage, Kobe University began with six faculties. Since then, new faculties and graduate schools were added, as well as reorganized for the enhancement of its academic environment. In October 1992, the Division of Liberal Arts and the Faculty of Education were reformed, resulting in the creation of the Faculty of Intercultural Studies, the Faculty of Human Development, and the Research Institute for Higher Education. At the same time, the Graduate School of International Cooperation Studies was newly established.

In October 2003, Kobe University of Mercantile Marine (KUMM which was founded as the Kawasaki Merchant Marine School in 1917, Kobe Nautical College in 1920) was integrated into Kobe University.

In April 2004, Kobe University was incorporated in accordance with the Japanese government's National University Corporation Bill. According to this integration, Faculty of Maritime Sciences, Sea Training Course and Maritime Sciences Division were established. In October 2007, Graduate School of Maritime Sciences was newly established.

Today, each faculty has its own graduate program, which promotes a better academic environment for students and researchers.

The programs of studies satisfy both the Japanese university establishment standards provided by the MEXT (Ministry of Education, Culture, Sports, Science and Technology) and also the Act on Ships' Officers and Boats' Operators provided by the Ministry of Land, Infrastructure, Transport and Tourism according to the minimum requirements of the International Maritime Organization (IMO). Over 90 % of the academic staff members are provided doctor degree of engineering, science, and maritime sciences.

The Maritime University actively co-operates in the conduct of joint research projects, such as International Association of Maritime Universities (IAMU) which was established as a member of incorporator in 1999.

Kobe University, Graduate school of Maritime Sciences

658-0022, 5-1-1, Fukaeminami, Higashinada

Kobe, Hyogo

JAPAN

Phone: +81 78 431 6200

http://www.maritime.kobe-u.ac.jp/index_e.html

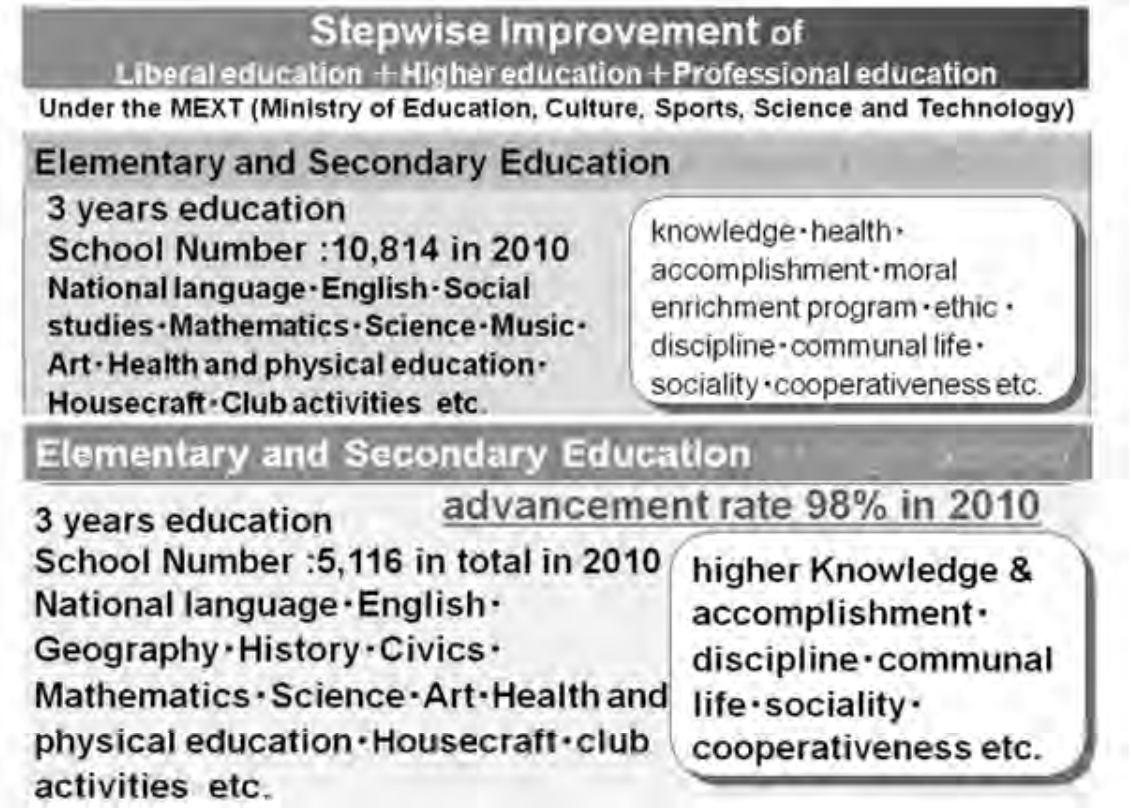


Fig. 1 Elementary and Secondary Education in Japan

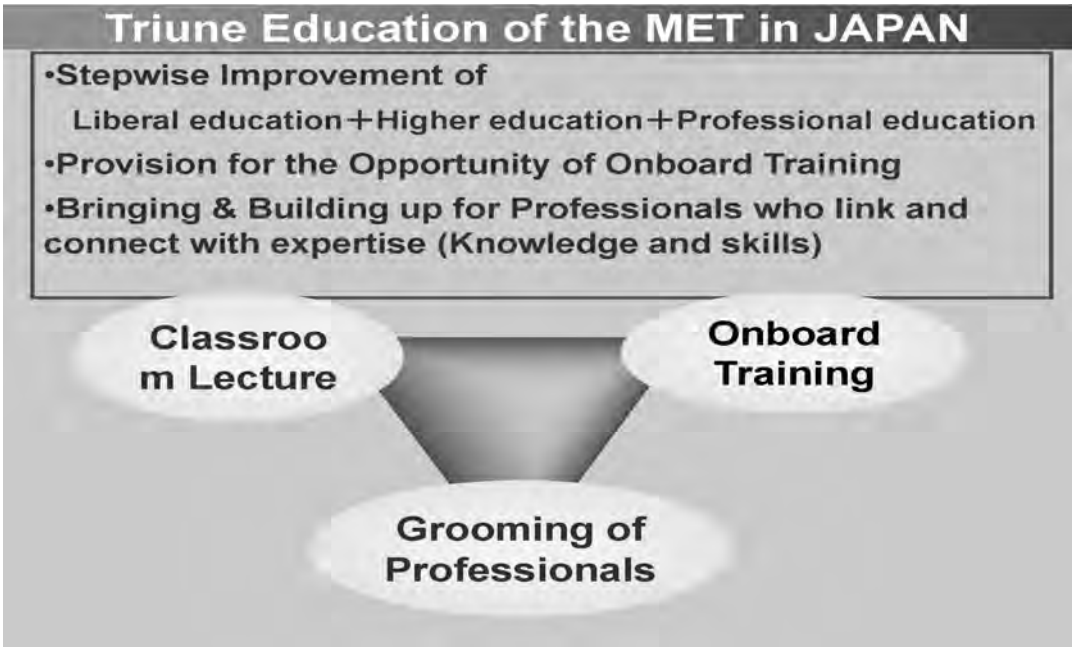


Fig. 2 Maritime Education and Training System in JAPAN

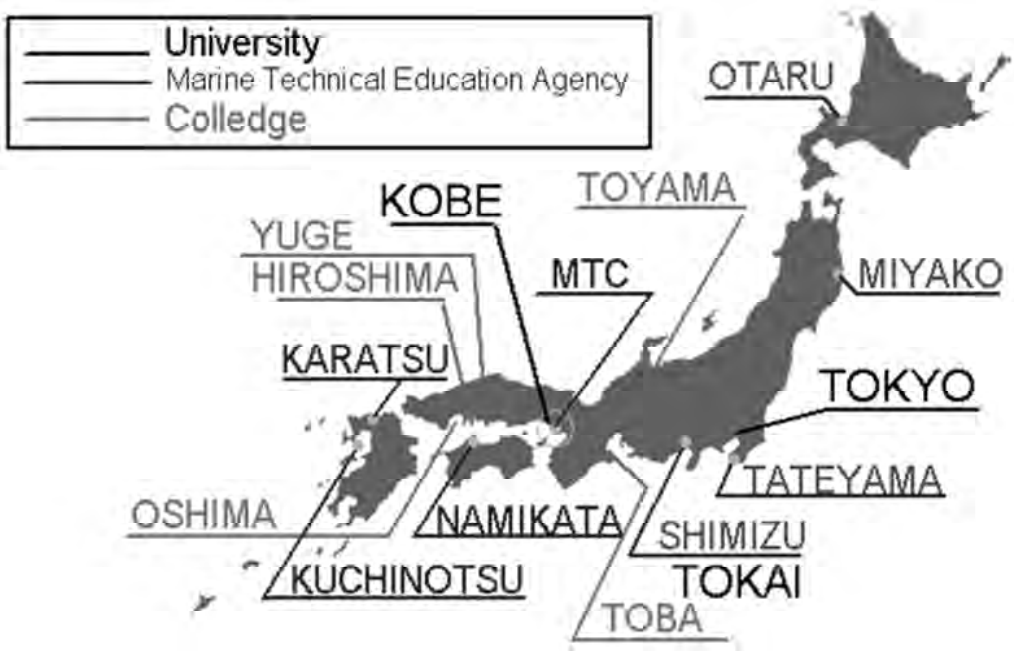


Fig. 3 Triune Education of the MET in JAPAN

3. ACADEMIC MARITIME EDUCATION

Fig.4 Maritime Higher Education & Professional Education in Japan

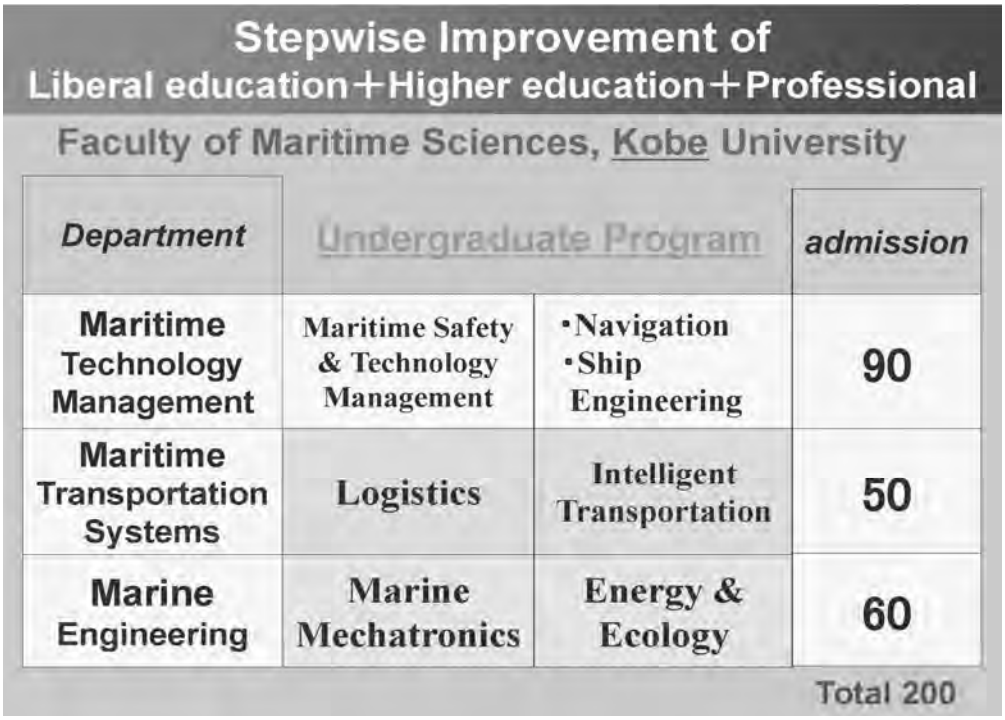


Fig.5 Undergraduate Program in Kobe

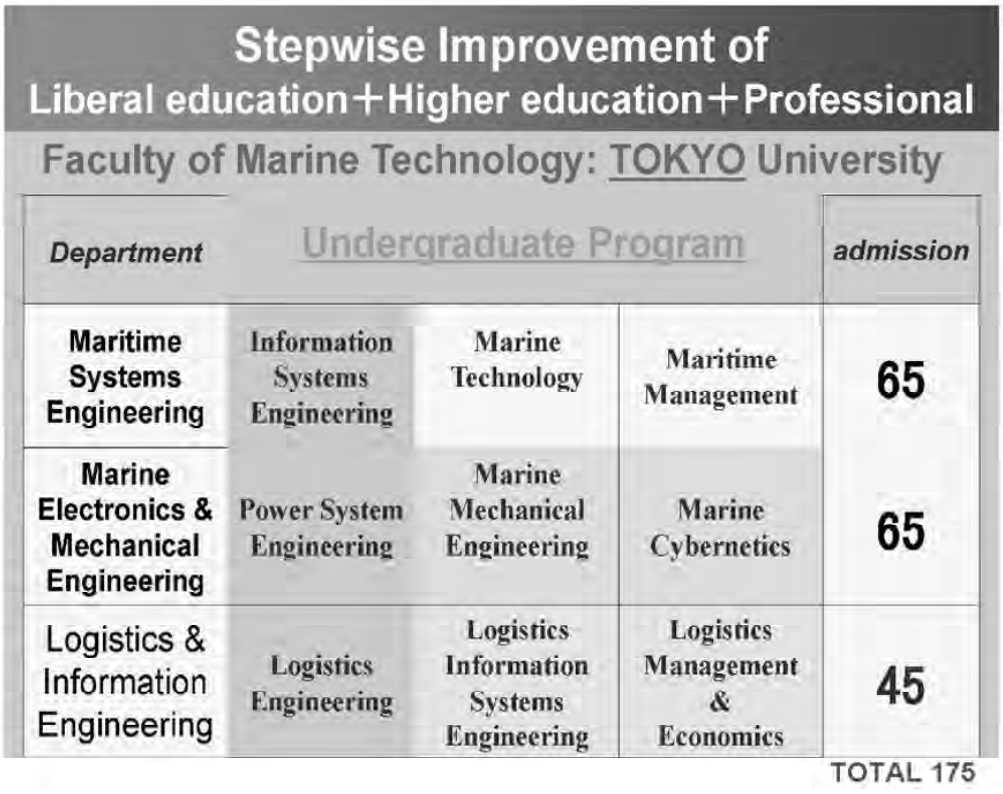
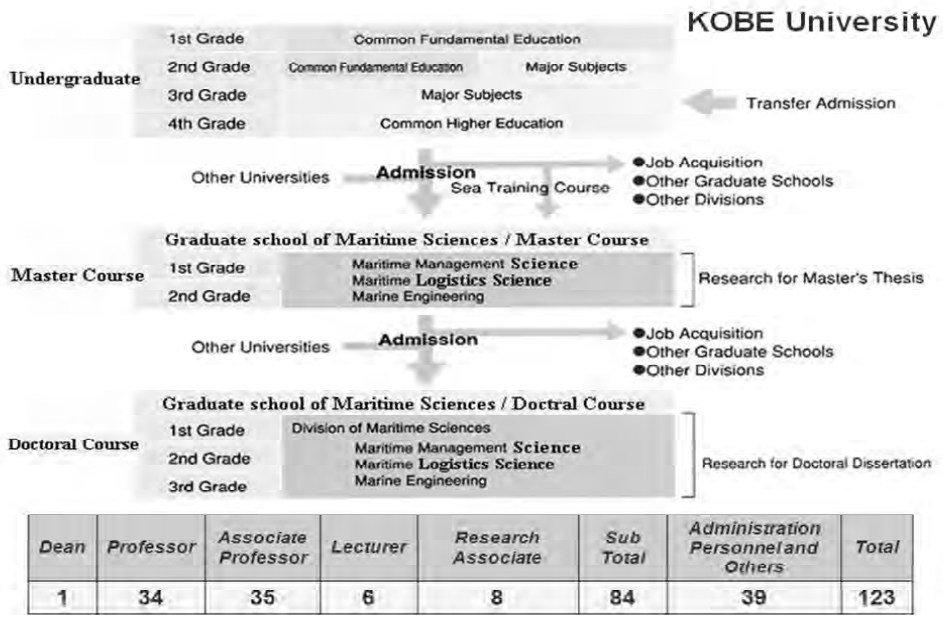


Fig.6 Undergraduate Program in Tokyo



Dean	Professor	Associate Professor	Lecturer	Research Associate	Sub Total	Administration Personnel and Others	Total
1	34	35	6	8	84	39	123

Fig.7 Course Structure in Kobe University, Graduate School Maritime Sciences

4. NON - ACADEMIC MARITIME EDUCATION

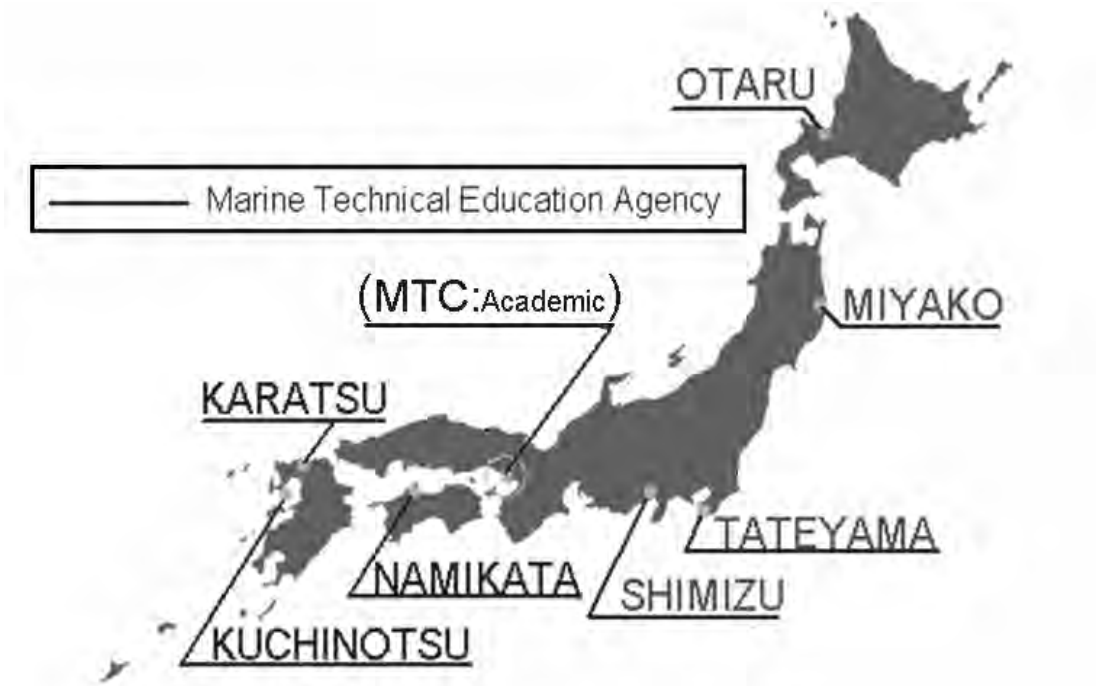


Fig.8 Non-Academic Maritime Education in JAPAN

5. STRUCTURE OF INSTITUTIONS

President

Organization

Administrative Office

Kobe University Libraries

Faculties, Schools →Faculty of Letters, Intercultural Studies, Human Development, Law, Economics, **School of Business Administration, Science, Medicine, Engineering, Maritime Sciences**

Graduate Schools →Graduate School of Humanities, Intercultural Studies, Law, Economics, Business Administration, Medicine, Health Sciences, Engineering, Agricultural Science, **International Maritime Education and Research Center, Training Ship "Fukae-maru",** International Cooperation Studies

Sea Training Course, Research Institute, Common-Use Facilities, Medical Center for Student Health, Career Center, Other Organizations

6. DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY

THEORETICALLY BOTH MARITIME UNIVERSITIES IN JAPAN (TOKYO AND KOBE) ARE ACTING IN THE SAME WAY.

7. STATISTICS OF NATIONAL MET

Under construction

8. TRAINING SHIPS

National Institute for Sea Training (NIST)

The NIST provides the students with on-board education and training on the training ship fleet which consists of 5 training ships in total;
2 sailing ships, Nippon Maru and Kaiwo Maru,
1 turbine engine ship, Taisei Maru,
2 diesel engine ships, Ginga Maru & Seiun Maru.

The NIST offers a training to 1,800 students per year approximately.
The total number of students in 62 years from 1943 to 2005 amounts to 126,939.

Training Ships operated by the NIST

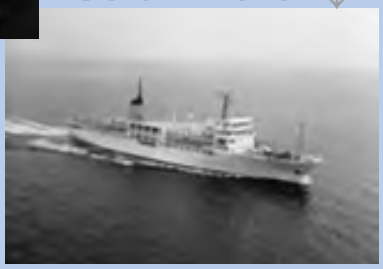
Nippon Maru ↑

Kaiwo Maru ↑

Taisei Maru↑

Ginga Maru ↓

Seiun Maru ↓



Hull and Engines	
Register	Tokyo
Kind of ship	Sailing ship
Shipyard	Sumitomo Heavy Industry
Date of Built	14-Sep-84
Code of Signals	JFMC
Loa * Breadth * Depth	110.09 m * 13.80 m * 10.71 m
Gross Tonnage	2,570 ton
Main Engine and powers	4 cycle diesel engines (2 sets) 3,000 PS (2,206 KW)
Fuel Oil(100%)	502.9 m3
Fresh Water	884 m3
Maximum / Sea speed	14.33 kn / 13.20 kn
range	9,800 miles (18,150 Km)
Complement	190 persons

Rigs	
Type of Rig	Four Masted Barque
Mast height and rake	Fore Mast : 42 m / 3.5 deg Main Mast : 43.5 m / 4.0 deg Mizzen Mast : 43 m / 5.0 deg Jigger Mast : 34 m / 5.5 deg Bow Sprit : 16.5 m / 17.5 deg (Hight is the length from Superstructure Deck to Track)

Hull and Engines	
Register	Tokyo
Kind of ship	Sailing ship
Shipyard	Sumitomo Heavy Industry
Date of Built	12-Sep-89
Code of Signals	JMMU
Loa * Breadth * Depth	110.09 m × 13.80 m × 10.71 m
Gross Tonnage	2,556 ton
Main Engine and powers	4 cycle diesel engines (2 sets) 3,000 PS (2,206 KW)
Fuel Oil(100%)	511.9 m3
Fresh Water	865 m3
Maximum / Sea speed	14.09 kn / 12.95 kn
range	9,800 miles (18,150 Km)
Complement	199 persons

Rigs	
Type of Rig	Four Masted Barque
Mast height and rake	Fore Mast : 42 m / 3.5 deg Main Mast : 43.5 m / 4.0 deg Mizzen Mast : 43 m / 5.0 deg Jigger Mast : 34 m / 5.5 deg Bow Sprit : 16.5 m / 17.5 deg (Hight is the length from Superstructure Deck to Track)

Hull and Engines	
Register	Tokyo
Kind of ship	Turbine Engine ship
Shipyard	Tsurumi Shipyard, N.K.K.
Date of Built	16-Mar-81
Code of Signals	JLPY
Loa * Breadth * Depth	124.84 m * 17.00 m * 10.50 m
Gross Tonnage	5,886.73 ton
Main Engine and powers	Turbine engine (1 sets) 7,000 PS (5,148 KW)
Fuel Oil(100%)	1,966 m3
Fresh Water	1,219 m3
Maximum / Sea speed	19.22 kn / 17.9 kn
range	12,600 miles (23,335 Km)
Complement	214 persons

Hull and Engines	
Register	Tokyo
Kind of ship	Diesel Engine ship
Shipyard	Mitsui Engineering & Shipping Co.,Ltd.,Chiba Works
Date of Built	15-Jun-04
Code of Signals	JFFP
Loa * Breadth * Depth	116.40 m * 18.00 m * 10.50 m
Gross Tonnage	6,185 ton
Main Engine and powers	Diesel engine (1 sets) 9,000 PS (6,600 KW)
Fuel Oil	1,698.51 m3
Fresh Water	833 m3
Maximum / Sea speed	20.50 kn / 18.65 kn
range	11,000 miles (20,372 Km)
Complement	246 persons

Hull and Engines	
Register	Tokyo
Kind of ship	Diesel Engine ship
Shipyard	Uraga Shipyard, Sumitomo Heavy Industries, Ltd.
Date of Built	25-Sep-97
Code of Signals	JLLY
Loa * Breadth * Depth	116.00 m * 17.90 m * 10.80 m
Gross Tonnage	5,890 ton
Main Engine and powers	Diesel engine (1 sets) 10,500 PS (7,723 KW)
Fuel Oil	1,641.07 m3
Fresh Water	1,357.32 m3
Maximum / Sea speed	21.0 kn / 19.5 kn
range	15,000 miles (27,780 Km)
Complement	252 persons

Provision for the Opportunity of
On-board Training & Research Activities

SHIOJI Maru
425GT: TOKYO

FUKAE Maru
449GT: KOBE

WAKASHIO Maru
231GT: TOYAMA

HIROSHIMA Maru
234GT: HIROSHIMA

KAIGI Maru
157GT: MTC

OSHIMA Maru
220GT: OSHIMA

9. STRUCTURE OF MARITIME PROGRAMS

Undergraduate Program Kobe University, Faculty of Maritime Sciences, JAPAN

Course Structure

Followings are the list of classes conducted in Undergraduate Program.

INTRODUCTORY SUBJECT
Maritime Sports and Boat Handling Aquatic Sports
Computer Literacy General Study 1 Communication English 1
Learn from the Sea

FUNDAMENTAL SUBJECT
Applied Mathematics 1 Oceanography Meteorology
Introduction to Transportation and the Environment
Introduction to the Study of Transportation
Basic Experiments of Maritime Science 1&2
On-board Training 1,2 & 3 On-board Seminar for Maritime Science
General Study 2 Leadership

COMMON SPECIALIZED SUBJECT

International Radio Communication and Regulations at Sea
Satellite Oceanography Chemical Oceanography
Materials and Environmental Engineering
Marine Environment Technology
Natural Energy Conversion Engineering
Maritime International Law
Economics of Maritime Industry
Safety Engineering Coastal Zone Environmental Chemistry
Marine Environmental Monitoring
Maritime Labor Law
Marine Sanitation

SPECIALIZED SUBJECT (Department of Maritime Technology Management)

(Group of Maritime Safety/Engineering Management)
Information Processing
Statistics
Introduction to Applied Mechanics
Maintenance Metrology
Introduction to Marine Environmental Management
Marine Environmental Life Engineering
Operations Research
Transportation Vehicle Engineering
Maritime Management Science
Maritime Technical Evaluation Theory
Methods of Reliability Theory
Risk Analysis of Ship Handling
Risk Analysis of Ship Hull
Marine Traffic Safety Management
Human Information Processing
Risk Management
Management of Technology Systems
Marine Casualties
Ports and Harbors Design
Fleet Management System
Native English

(Group of Nautical Science)
Fix and Sailing
Celestial Navigation
Exercise in Navigation
Ship Handling 1 and 2
Marine Electronics
Navigational Aids
Naval Architecture
Dynamics of Ship Motion
Good Seamanship for Maritime Safety
Rules of the Maritime Road
Maritime Laws
Navigation Information
Marine Meteorology
Laboratory in Navigation 1 ,2 and 3
Ship Management Practice 1, 2 and 3
Maritime English

Industrial maritime affairs social circumstances
(Group of Marine Engineering)
Manufacturing Practice
Engineering Thermodynamics
General Electric Circuits
Strength of Materials
Fluid Mechanics
Fluid Machinery
Manufacturing Processes
Naval Architecture
Control Theory
Heat Engine
Electromagnetic Machinery
Drawing Exercise
English for Marine Engineering
Propulsion Engineering
Fuel Combustion & Lubricating Theories
Management of Ship's Machinery
Ship Management Practice
Exercise in Marine Engineering
Marine Engineering Laboratory

SPECIALIZED SUBJECT (Department of Maritime Logistics)
(Group of Transportation Science)
Transportation Economics
Cargo Management
Statistics
Introduction to Applied Mechanics
International Transportation Economics
Behavior in Transportation
Strength of Materials for Packaging
Material Handling
Operations Research
Logistics Systems Planning
Terminal Planning
Maritime Cargo Transportation
Planning of Ports and Harbors Cargoes
Transportation Planning
Transportation Systems Analysis
Packaging Materials
Material Chemistry
Transportation Engineering for Dangerous Cargo
Ship Management Practice
Lab. in Maritime Transportation Systems
Advanced Exercise in Systems Science
English of Science & Technology

(Group of Intelligent Transportation)
Discrete Mathematics
Introduction to Artificial Intelligence
Information Processing
Computer System
Advanced Information Processing
Program Design

Exercise in Program Design
Marine Information Processing
Marine Meteorology Information
Marine Pollution
Ship's Navigation
Marine Instrumentation
Ship's Navigation System
Communication Systems for Marine
Theory of Communication Networks
Outline of Maritime Engineering
Introduction of Marine Transportation System
Introduction to System Technologies

SPECIALIZED SUBJECT (Department Marine Engineering)

(Group of Marine Mechatronics)
Electrical Circuit
Applied Mathematics 2
Applied Mathematics 3
Strength of Materials
Simulation Engineering
Manufacturing Processes
Mechanical Drawing
Manufacturing Practice
Kinematics of Machine
Machine Design
Control Theory
Electronic Circuits
Electrical and Electronic Materials
Electromagnetic Machinery
Power Electronics
Mechanical Vibration
Strength and Fracture of Materials
Metals and Alloys
Fluid Machinery
Superconductor Technology
Exercise in Marine-Mechatronics

(Group of Ecological Energy)
Engineering Thermodynamics
Information Processing
Fluid Mechanics
Materials Science
Statistical Mechanics
Physics of Atoms
Electromagnetic Energy
Introductory Quantum Energetics
Heat Transfer
Thermofluid Analysis
Refrigeration Engineering
Internal Combustion Engines
Energy Plant Engineering
Fuel Combustion & Lubricating Theories
Atomic Energy Engineering
Hydrogen Energy Engineering

Elementary Sub-atomic Science Technical English Marine Engineering Laboratory Ship Management Practice Exercise in Eco-Energy Engineering

10. OBT SCHEME

UNDERGRADUATE STUDY

NIST onboard TRAINING ships	a)	1 Month OBT 1st Year
	b)	1 Month OBT 2nd Year
	c)	1 Month OBT 3rd Year
	d)	3 Months OBT by Sailing Ship 4th Year
After Graduation		
NIST onboard TRAINING ships	e)	6 Months OBT in the **Sea Training Course**
Or OBT on the Merchant Training ships		
TOTAL		12 MONTHS

11. ACADEMIC PERSONAL DATABASE

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>FURUSHO</td><td>MASAO</td><td>Dr. (Psychology)</td><td>Master Mariner</td><td>Professor</td></tr>
<tr><td rowspan="4">TEL. +81 78 431 6246
FAX + 81 78 431 6246
MOBILE +81 90 5362 2858
EMAIL
furusho@maritime.kobe-u.ac.jp

ADDRESS: 658-0022, 5-1-1, Fukaeminami,
HigashinadaKobe, Hyogo, JAPAN</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. English</td><td colspan="3">1. Seamanship
2.Management in Safety Ship’s Operation
3. Human Factors</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Safety in Navigation

2. Visual Perception

3. Human Element/ Human Error</td><td colspan="2">1. Seamanship

2. Traffic Psychology at Sea

3. Human Interface</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1. “Maritime Law, Seizando Publish Company, 2010
2. “For the Safety at Sea Based on the IM Model, Masao FURUSHO, The Proceedings of the 8th Annual Conference of the Asia Maritime & Fisheries Universities Forum (AMFUF), KOREA Maritime University , pp.61-66, 2009
3. “Voluntary Management for the Effective Use of the Area at Near Shore Waters, The Journal of JAPAN INSTITUTE of NAVIGATION, No.120, pp.45-50, 2009, ISSN 0388-74057
4. Investigation on the Factors of VTS Operators's Mental Workload: Case of Turkish Operators, The Proceedings of International Maritime Lecturers' Association 16th Conference on MET, 2008, pp.335-345, Dokuz Eylul university Publications, ISBN 978-975-441-256-7
5. “ Field Factor in the Sea Traffic Related Human Factors” Proceedings of CIEVol.2, pp.D4-46-49CIE(Commission Internationale Bureau De L'eclairage) Central, 2007. ISBN 978 3 901 906 59 6</td></tr>
</table>

5.2.2 Gdynia Maritime University (Poland)

1. GENERAL INFORMATION OF THE INSTITUTION

Gdynia Maritime University is the largest state school of higher maritime education in Poland and one of the largest in Europe. Since 1920 the University has been preparing graduates for officer positions on board merchant marine vessels and for managerial positions at the land-based institutions and companies representing the maritime industry and seaside regions. The University four Faculties offer degree in Navigation, Marine Engineering, Marine Electrical Engineering and Business Administration. At present Gdynia Maritime University provides studies for 8000 students.

The programs of studies satisfy both Polish educational standards provided by the Ministry of Education and also the requirements of the International Maritime Organization – IMO. The academic staff – representing doctor of science degree and scientific titles of a professor accompanied, in many cases, by the highest marine diplomas of a Master Mariner, Chief Engineer Officer and Shipboard Electrical Engineer – supported by the laboratory facilities offering 25 specialised simulators and ISO 9001 education quality management system implemented by the University.

The Maritime University actively co-operates in the conduct of joint research projects, preparation of young generation academic staff and in the exchange of students with 18 maritime institutions of higher education within international organisations such as: European University Association (EUA) and International Association of Maritime Universities (IAMU).

The new strategy for further growth and development adopted by the Senate of Gdynia Maritime University will ensure the strengthening of the University role as a worldwide marineoriented centre of studies and training preparing professionals – citizens of the World.

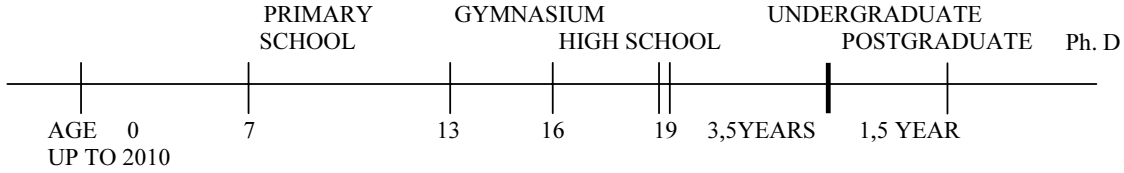
Gdynia Maritime University

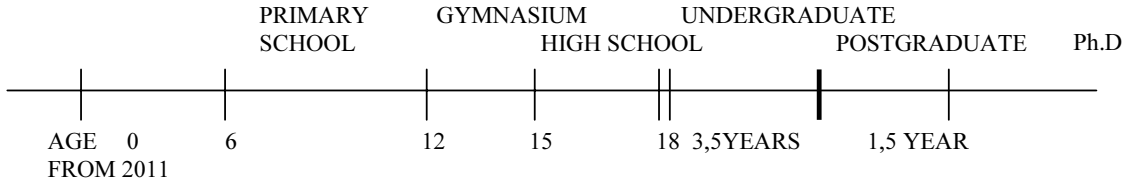
81-87 Morska St.
81-225 Gdynia
Poland

Phone: +48 58-621-70-41
Numbers information: +48 58-6901-292
Navigation Faculty
Phone: +48 58-620-13-01
Number information: +4858-6901-121
Fax: +48 58-620-67-01

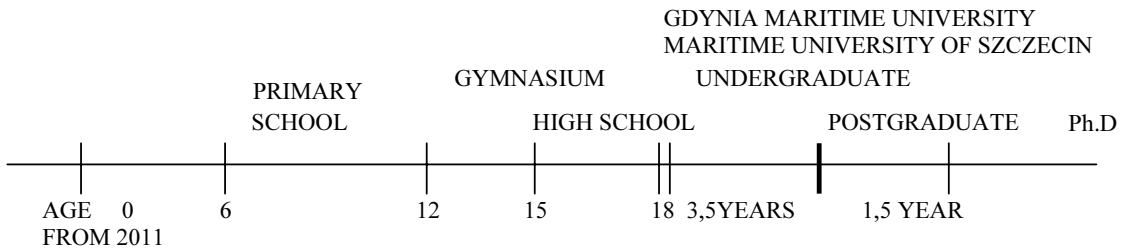
www.am.gdynia.pl

2. NATIONAL SYSTEM OF THE EDUCATION AND MET





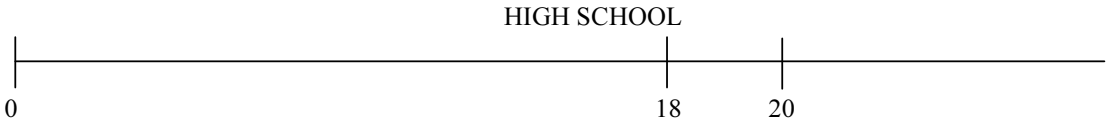
3. ACADEMIC MARITIME EDUCATION



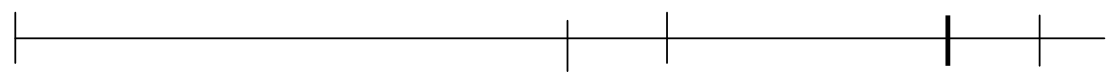
4. NON - ACADEMIC MARITIME EDUCATION

1. PRIVATE GDYNIA MARITIME

2. GDYNSKA MARITIME SCHOOL
3. SZCZECIN MARITIME SCHOOL

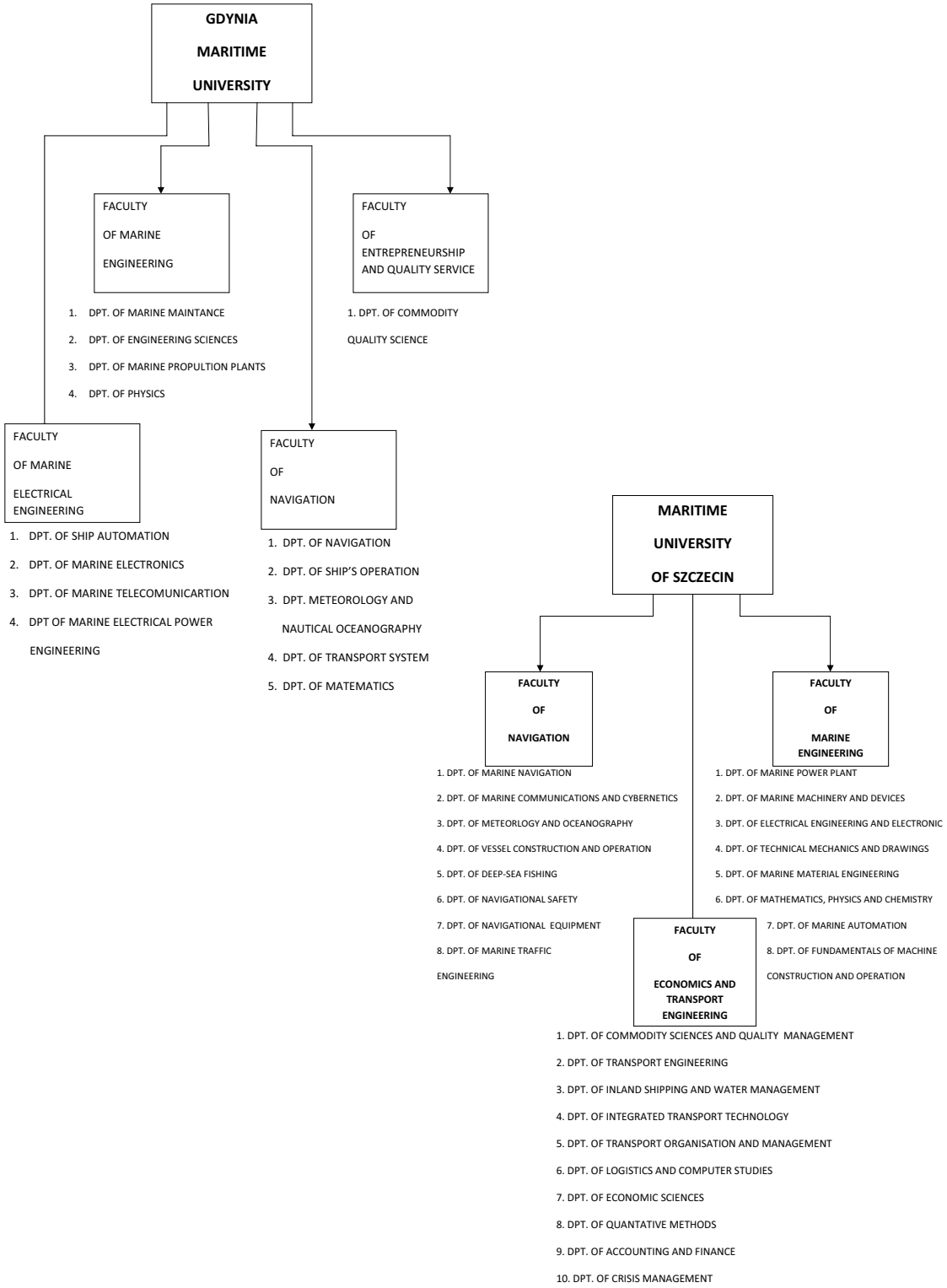


4 MARITIME SECONDARY SCHOOL
DARLOWO
SWINOUJSCIE
KOLOBRZEG
GDANSK



(ONMA)

5. STRUCTURE OF INSTITUTIONS



6. DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY

THEORETICALLY BOTH MARITIME UNIVERSITIES IN POLAND (GDYNIA AND SZCZECIN) ARE ACTING IN THE SAME WAY.
GDYNIA MARITIME UNIVERSITY HAS 4 FACULTIES, BUT MARITIME UNIVERSITY OF SZCZECIN ONLY 3 FACULTIES.

SZCZECIN MARITIME UNIVERSITY SPECIALIZES IN HYDROGRAPHIC, FISHERY AND
INLAND NAVIGATION. GDYNIA MARITIME UNIVERSITY GRADUATED OFFICERS FOR ALL TYPES OF MERCHANT FLEET VESSELS AS WELL AS FOR OFF-SHORE INDUSTRY VESSELS (inc. DP).

TOTAL QUANTITY OF STUDENTS IN GDYNIA 8000 IN SZCZECIN 5000.
TO BE CONTINUED…

7. STATISTICS OF NATIONAL MET

To be continued

8. TRAINING SHIPS

Dar Młodzieży ("the gift of youth") is a Polish sailing training ship designed by Zygmunt Choreń and launched in 1982 in the Gdańsk shipyard, Poland. Its home port is Gdynia (Poland). It has replaced *Dar Pomorza*.

Specifications:

- Length: 108,815 m (including bowsprit)
- Width: 14 m
- Height: 62.1 m
- Depth: 6.3 m
- Sail surface: 3015 m²
- Crew: 176 persons (40 crew and 136 cadets)

Detailed Specifications:

• Type of ship: Sailing-school, Three mast frigate • Flag: Poland • Port of Registry:Gdynia • Year, place and symbol of the construction: 1982, Gdansk Shipyard, B95 / 1 • Call sign: SQLZ • Class PRS: A 16 hp 1 sp • Height to main deck: 7.815 m • Height to upper deck: 10.05 m • Sail area of the basic: 3015 sq. m • Elevation masts: 49.5 m 49.5 m 46.5 m • RTD: 2384.85 t • NRT: 335.37 t • Displacement: 2946 t • Speed Sailing: • Highest daily mileage: 264.7 Nm (average speed 11.29 knots) • Maximum instantaneous speed: 16.5 knots • Main engine: Cegielski - Sulzer type 8 AL 20/24, 2 * 750 PS (552 kW) • The speed of the engine: Economic speed: 9 knots • Maximum speed: 12 knots • The crew: 40 • Apprentices: 136

Horyzont II

Length	56.34 m
Breadth	11.35 m
Draft	5.33 m
Tonnage	1321 BRT
Max No Persons	57
Crew	14
Cadets	43
Engine type	1280 kW
Speed	12.0 kn
Flag	Polish
Port of registry	Gdynia
Build	Poland 2000

FACULTY OF NAVIGATION

Summer semester (II); SUM of ECTS: 30

No.	Course title	Description	A	C	L	ECTS	Unit
1	Basic Principle Of Electronics	Basic principle of electronics	15		15	2	1
2	Physics	Lectures: Introduction to modern physics. Relativity,the wave nature of particles,quantum mechanics, atomic structure, nuclear and particle physics. Laboratory: performing physics experiments according to the subject of lectures.	15		15	3	12
3	Informatics	Data representation. Programming in Pascal. Introduction to object programming.	30		30	4	1
4	English	General English: Maritime English- Meteorological Terms. Safety Equipment. Charts. Aids to Navigation. Lines and Ropes. SMCP		45		2	24
5	Machine Design & Engineering Graphic	The chosen fundamentals problems of statics and strength of machine elements. The basis of engineering drawing.	15	15	15	3	9
6	Mathematics	Multidimensional mathematical analysis: differential calculus of functions of several variables, multiple integrals. Sequences, numerical and function series. Spherical trigonometry. Elements of probability calculus.	45	45		4	5
7	Meteorology And Oceanography	Oceanography: marine sediments, geology and the coastal regions, sea temperature, salinity, density, sea ice, ship icing, ocean waves, sea state, ocean circulation, seiche, surze. Meteorology: radiation, energy balance, air temperature, evaporation, humidity, atmospheric instability, clouds, precipitation, fog, visibility	30		15	3	3
8	Navigation	Mercator Projection, Gnomonic projection, transverse Mercator Projection, Dead Reckoning, Charts Corrections, Notices to Mariners, Navigational Warnings, Hydrographic Publications Correction, Information from charts, list of lights and other publications, Electronic Navigational Chart and ECDIS, Chartwork Exercises.	15		30	2	1
9	Navigational Equipment	Marine logs. Gyrocompass. Autopilots.	15		15	2	13
10	Sports	Swimming-pool: Teaching to swim freestyle. Gym hall: Improvement of skills in team oriented games (basketball, volleyball, football etc.).		30			23
11	Basic Sea Practice					5	1

FACULTY OF NAVIGATION

Fall semester (III); SUM of ECTS: 30

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	The determination of position At sea from altitudes and azimuths of celestial bodies. The calculation of angles and Times of astronomical phenomena with help of The Nautical Almanac.	15		30	3	1
2	Construction And Stability Of Ship	Dimensions and hydrostatic dates, calculation of ship parameters, construction of ship.	30		30	4	2
3	English	General English: Maritime English- Weather Forecasts. Electronic Aids to Navigation. Navigating Techniques and Instruments. Types of Cargo. SMCP		45		2	24
4	Meteorology And Oceanography	Meteorology: atmospheric pressure, winds, circulation within the troposphere (Hadley and polar cells), air masses, highs, fronts, lows, trades, ITCZ, monsoon, tropical cyclone.	30		15	5	3
5	Navigation	Dead Reckoning, Coastal Navigation, Position lines and Positions, Sailings, Information from charts, list of lights and other publications, Chartwork Exercises.	15		30	3	1
6	Control Engineering	Models for dynamical systems, analysis and design methods for continous-time and nonlinear systems, PID control, relay regulators, digital control, optimal, adaptive and game control systems, automation of ship control processes, artificial intelligence methods in marine navigation.	30		30	5	13
7	Marine Power Plants	Marine power plants functioning principles and construction:-power plants layout and configuration; -propulsion systems; -main engines; -diesel generators; -auxiliary equipment (steering gears, controllable pitch propellers, bow thrusters, steam boilers, pumps, compressors, biological savage treatment plants, oily water separators, fresh water generators, fuel oil separators).	30			2	6
8	Information Technology	Introduction to Database Management Systems.Word processing. E-mail Technology. Introduction to Computer Networks.	15		30	2	1
9	Navigational Equipment	Satellite Navigation Systems: GPS, DGPS, SBAS, GLONASS, Galileo Compass, Terrestrial Radionavigation Systems ? Loran C. Reference Coordinate Systems, Time, Hydroacoustics, Echosounder.	30		30	4	1
10	Sports	Teaching to swim butterfly.		15			23

Summer semester (IV); SUM of ECTS: 30

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	The algorithmization of computations on celestial navigation. The estimation of accuracy of astronomical observations and calculation of precision of celestial fix.	10	10		4	1
2	Construction And Stability Of Ship	Ship strength, ship equipment.	20		10	3	2
3	Maritime Transport Economics	Maritime transport and its functions in the global economy. Costs in maritime transport companies and their classifications. Charging schemas and practices; freight indices. Freight markets - their dynamic and methods of their analyses. Shipping policy and regulation schemas in maritime sector.	20			1	4
4	English	General English: Maritime English- Cargo Handling Gear. Containerization. Standard Marine Communication Phrases. MarEng. SMCP		30		2	24
5	Navigation	Great Circle, Rhumb Line, Accuracy Standards for Navigation, Chartwork Exercises.	10		20	3	1
6	Sea Enviromental Protection	Sea Environments Protection' course gives overview of the situation of sea ecosystems and how to manage and protect it.	20			1	14
7	Maritime Law	Public maritime law. Maritime administration, (maritime office), maritime chambers, safety at sea, protection and preservation of marine environment. Maritime labour law. Elements of polish labour law, International Labour Organization, conventions ILO. International law of the sea (UNCLOS, territorial sea, innocent passage, straits, e. e. z, high sea area).	30			2	2
8	Cargo Handling And Stowage	The technical application of transportation science based on current trends is presented. During the lectures the most important properties of some group of cargoes connected with their safe transportation are discussed.	20		20	3	2
9	GIS - ECDIS	GIS - Definition, Vector Data versus Raster Data, Data Display, International standards for ECDIS, main Types of ECS, ECDIS Data, main Functions of ECDIS, Presentation of ENC, Navigational sensors, Route Planning, Route Monitoring, Special Functions, Data Updating, Alarms and Indications, Malfunction of ECDIS, System Integrity, Back-up Arrangements, System Limitations.	10		20	2	1
10	Navigational Equipment	Basic radar principles, radar system – operational principles and controls, false and unwanted radar responses. Radar navigation, radar beacons, passive and active radar reflectors	20		10	3	1
11	Sports	Teaching water life-saving techniques.		10			23
12	Navigational Practice					6	1

FACULTY OF NAVIGATION

Fall semester (V); SUM of ECTS: 30

No.	Course title	Description	A	C	L	ECTS	Unit
1	Construction And Stability Of Ship	Statical and dynamical stability of merchant ships.	30		30	4	2
2	English	General English: Maritime English - Tides. Ship's Deck Log Book. Collision Regulations. Ship's Safety Equipment-Alarms and Drills. Sea Environment – Pollution Prevention. SMCP		45		2	24
3	Sea Communication	Principles and Basic feature of the maritime mobile service, The Inmarsat system (standard B,C,M, Fleet F77), Global Maritime Distress and Safety System	30		30	3	2
4	Shiphandling	Basic maneuverability theory, ship maneuverability characteristics, major rules of shiphandling, IMO maneuverability standards.	30		30	3	2
5	Navigation	Magnetic Compass compensation, magnetic Variation, Tides and Tidal Streams, Definition – Earth, Charts, Datums, Compass correction, Distances, Chartwork Exercises.	30	30		4	1
6	Maritime Law	Maritime civil law. Seagoing vessel, polish nationality of vessel, registers of ships, maritime liens, mortgages, shipmaster, ship's operator and his liability, maritime contracts (carriage of cargo, carriage of passengers, time-charter, ship's agent, shipbroker, towage, pilotage, maritime salvage). General average, collision of vessels, recovery of property from the sea, wrecks removal. Maritime insurance (contract of marine insurance, floating insurance, insurance cargo, casco, P&I clubs).	30			2	2
7	Cargo Handling And Stowage	Carriage of goods and port operations of bulk (Dry and Liquid) cargoes.	30		30	4	2
8	Ship Safety Management And Operation	LSA Code, Ship Grounding Analysis, Underway Shipboard Emergencies: Fire, Abandon Ship, Man Overboard, Drills at Sea, Search and Rescue.	30		30	3	2
9	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.		15		1	-
10	Navigational Equipment	Target detection and radar range equation. Use of radar for anti-collision purposes, radar plotting aids, ARPA and ATA – specified and additional facilities.	30		30	4	1
11	Sports	Long distance swimming.		15			23

Summer semester (VI); SUM of ECTS: 30							
No.	**Course title**	**Description**	**A**	**C**	**L**	**ECTS**	**Unit**
1	Construction And Stability Of Ship	Damage stability of ship.	26		26	3	2
2	English	General English: Letter Writing. Maritime English- Electronic Charts. Medical Service at Sea. Communication-GMDSS. IMDG Code. Ports and Cargo Handling Facilities. SMCP		39		2	24
3	Sea Communication	Maritime Safety Information, GMDSS satellite distress urgency and safety communication procedure, GMDSS terrestrial, distress, urgency and safety communication procedures.	26		26	3	2
4	Colreg	Remaining Colreg Rules regarding relations between ships in good and restricted visibility, examples of ships collisions, structure and methods of works sea courts (also in Poland), exercises on the simulator – application Colreg rules in sea passage.	26		13	2	1
5	The Humanities	Elements of management psychology and sociology: The psycho-sociological background of the functioning of a sea-going vessel crew; avoiding and solving interpersonal conflicts. Corporate behaviours: Corporate culture – the external and internal determinants of individuals' behaviours in an organisation. Human resource management (management style, authority, influences, leadership).	26			2	18
6	Navigation	Route Planning, Ocean Routes, Weather Navigation, Voyage Passage, Checklists, Restricted Waters, Route Optimization, Navigational Calculations, WGS-84, Integrated Navigational Systems.	26		26	3	1
7	Cargo Handling And Stowage	Stowage and securing different cargoes (general cargo, ro-ro, container's specialized cargoes, etc.) on board specialized vessel and organization of loading/discharging operations.	26		26	3	2
8	B.Sc. Thesis Seminar	Logic structure of B.Sc. thesis. Goal definition. Source search. Partial and final presentation.			13	1	-
9	Navigational Equipment	Use of radar for SAR purposes. INS, IBS and (S)VDR. VTS and SMS.	13		26	2	1
10	Basic Seamanship	Ship's cargo handling appliances, deck openings, maintenance, routine and emergency procedures	13			1	2
11	Monographic Lecture - Navigation		26			1	1
12	Ship Management	Ship documents, ship operation.	26	13		3	2
13	Shiphandling Practice					4	1

FACULTY OF NAVIGATION

Fall semester (VII); SUM of ECTS: 31

No.	Course title	Description	A	C	L	ECTS	Unit
1	Celestial Navigation	Raport about sea practice.			10	2	1
2	Construction And Stability Of Ship	Raport about sea practice.			10	2	2
3	Meteorology And Oceanography	Raport about sea practice.			10	2	3
4	Colreg	Practical application of Colreg rules, basis on the students' reports from onboard training, study of Collision reports.			10	2	1
5	Navigation	Raport about sea practice.			10	2	1
6	Thesis					15	-
7	Cargo Handling And Stowage	Raport about sea practice.			10	2	2
8	Navigational Equipment	Raport about sea practice.			10	2	1
9	Ship Management	Raport about sea practice.			10	2	2

PLAN STUDIÓW 2009
KIERUNEK: NWIGACJA
SPECJALNOŚĆ: TRANSPORT MORSKI
STUDIA STACJONARNE I STOPNIA
(Zatwierdzony przez RWN w dniu 19.03.2009 r., ze zmianami zatwierdzonymi przez RWN w dniu 17.09.2009 r.)

Lp	PRZEDMIOTY	GODZINY							ROZKŁAD ZAJĘĆ PROGRAMOWYCH																									
		SUMA	NA UCZELNI			PRAKTYCKI MORSKIE I ZGRUPOWANIA				SEMESTR I				SEMESTR II				SEMESTR III				SEMESTR IV				SEMESTR V				SEMESTR VI				SEMESTR VII				SEMESTR VIII			
										15 tyg.				15 tyg.				15 tyg.				14 tyg.				15 tyg.				13 tyg.				15 tyg.				13 tyg.			
										LICZBA GODZIN W SEMESTRZE																													
			A	C	L	ROK I	ROK II	ROK III	ROK IV	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS	A	C	L	ECTS
PRZEDMIOTY OGÓLNE		462	77	264	28																																				
1	JĘZYK ANGIELSKI	240		240						45			2	45			2	45			2	30			2	45			2	30			2								
2	WYCIEGWANIE FIZYCZNE	100		100						30				30				15				10				15															
3	EKONOMIA	45	30	15						30	15		2																												
4	NAUKI HUMANISTYCZNE	26	26																											26			2								
5	TECHNOLOGIA INFORMACYJNA	45	15		30													15		30	3																				
PRZEDMIOTY PODSTAWOWE		480	225	90	165																																				
6	MATEMATYKA	165	90	75						45	30		5	45	45		6																								
7	FIZYKA	75	30		45					15		30	4	15		15	3																								
8	INFORMATYKA	60	30		30									30		30	4																								
9	ELEMENTY ELEKTRONIKI	30	15		15									15		15	2																								
10	PODSTAWY AUTOMATYKI	60	30		30													30		30	4																				
11	KONSTRUKCJA MASZYN I GRAFIKA INŻYNIERSKA	45	15	15	15									15	15	15	4																								
12	EKLEKTROTECHNIKA OKRĘTOWA	45	15		30					15		30	4																												
PRZEDMIOTY KIERUNKOWE		2052	540	25	432																																				
13	NAWIGACJA	312	111	36	151	10	10			15	15	15	3	15		30	2	15		30	5	10		20	2	30	15	15	4	26		26	3			3	4			10	1
14	ASTRONAWIGACJA	90	25	10	45		10											15		30	4	10	10		2											3	4			10	2
15	MPDM	99	45		43	5		10		15		15	2																	26		13	3			3	4			10	2
16	URZĄDZENIA NAWIGACYJNE	281	121		140		30	10						15		15	2	30		30	3	20		10	4	30		30	4	26			3			3	4			50	2
17	METEOROLOGIA I OCEANOGRAFIA	120	60		45	5	10							30		15	3	30		15	4															3	4			10	2
18	BUDOWA I STATECZNOŚĆ STATKU	227	106		111			10										30		30	3	26		10	4	30		30	4	26		26	3			3	4			10	2
19	PRZEWOZY MORSKIE	167	76		91																	70		20	5	30		30	4	26		26	3			3	4			10	1
20	ZARZĄDZANIE STATKIEM	97	26	6	41																									26		26	2			3	4			10	1
21	EKONOMIKA TRANSPORTU MORSKIEGO	26	26																			26			1																
22	PRAWO MORSKIE	66	66																			30			2	36			2												
23	MANEWROWANIE STATKIEM	72	32		30			10																		32		30	4												
24	RATOWNICTWO MORSKIE	110	30		30	20			30																	30		30	3												
25	ŁĄCZNOŚĆ MORSKA	157	71		71		5	10		15		15	4													30		30	2	26		26	2								
26	SILOWNIE OKRĘTOWE	30	30															30			2																				
27	OCHRONA ŚRODOWISKA MORSKIEGO	20	20																			20			1																
28	BEZPIECZEŃSTWO I HIGIENA PRACY	15	15							15			2																												
29	WIEDZA OKRĘTOWA	45	24			10	5			15			2																	13			1								
30	SYSTEMY INFORMACJI PRZESTRZENNEJ	30	30		30																	10		20	2																
31	WYKŁAD MONOGRAFICZNY	26	26																											26			1								
32	SEMINARIUM DYPLOMOWE	29		15	14				21																			15		1		13	1					1	2
33	SZKOLENIE MEDYCZNE	33				12			21																																
34	OCHRONA PRZECIWPOŻAROWA	54				18			36																																
35	BEZ. OSOBISTE I ODPOW. WSPÓLNA	23				23																																		
36	PRACA DYPLOMOWA																																							
37	PRAKTYKA MORSKA																6												6				6								15
	RAZEM:	3630	1266	569	1627	163	55	50	87	180	135	165	30	180	135	135	26	195	60	195	30	160	55	80	25	242	90	195	30	247	39	156	26			90	32			121	30
			2746			290																																		
KURSY PODSTAWOWE I SPECJALISTYCZNE		310																																						
37	INDYWIDUALNE TECHNIKI RATOWNICZE	20																																						
38	PIERWSZA POMOC MEDYCZNA ST. PODST	11																																						
39	PODSTAWOWY KURS PRZECIWPOŻAROWY	16																																						
40	BEZ. WŁASNE I ODPOW. WSPÓLNA	23																																						
41	RATOWNIK MORSKI	30																																						
42	GMDSS	116																																						
43	RADAR + ARPA	160																																						
44	PIERWSZA POMOC MEDYCZNA ST. WYŻSZY	21																																						
45	WYŻSZY KURS PRZECIWPOŻAROWY	33																																						
PRAKTYKI																																								
46	DAR MŁODZIEŻY	1 m											4																												
47	DAR MŁODZIEŻY	2 m																			5																				
48	HORYZONT II	0,5 m																											5												
49	STATKI EKSPLOATACYJNE	7																																						
LICZBA GODZIN W TYGODNIU										28				27				28				28				29				26								16			
LICZBA EGZAMINÓW										3				3				3				3				4				4								0			
LICZBA ZALICZEŃ										8				8				7				8				7				8								8			

10. OBT IN GDYNIA MARITIME UNIVERSITY SCHEME

UNDERGRADUATE STUDY

HORYZONT TRAINING VESSEL	a)	2 WEEKS RADAR OBSERVER COURSE
	b)	2 WEEKS MANOEUVRIBILITY COURSE
DAR MLODZIEZY SAILING	a)	1 MONTH
TRAINING SHIP	b)	2 MONTHS
AFTER COMPLETING 3 YEARS AT SCHOOL		
TRAINING ON CARGO SHIPS		8 MONTHS

TOTAL 12 MONTHS

11. ACADEMIC PERSONAL DATABASE

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	**NAME**	**DEGREE**	**MARITIME LICENSE**	**ACADEMIC POSITION**
FURUSHO	**MASAO**	**Dr. (Psychology)**	**Master Mariner**	**Professor**

TEL. +81 78 431 6246 FAX + 81 78 431 6246 MOBILE +81 90 5362 2858 EMAIL furusho@maritime.kobe-u.ac.jp ADDRESS: 658-0022, 5-1-1, Fukaeminami, HigashinadaKobe, Hyogo, JAPAN	**LANGUAGE**	**SPECIALITIES**
	1. English	1. Seamanship 2.Management in Safety Ship's Operation 3. Human Factors
	RESEARCH INTERESTS	**TEACHING SPECIALITIES**
	1. Safety in Navigation 2. Visual Perception 3. Human Element/ Human Error	1. Seamanship 2. Traffic Psychology at Sea 3. Human Interface

PUBLICATIONS (5 ONLY AFTER 2005)

1. "Maritime Law, Seizando Publish Company, 2010
2. "For the Safety at Sea Based on the IM Model, Masao FURUSHO, The Proceedings of the 8th Annual Conference of the Asia Maritime & Fisheries Universities Forum (AMFUF), KOREA Maritime University , pp.61-66, 2009
3. "Voluntary Management for the Effective Use of the Area at Near Shore Waters, The Journal of JAPAN INSTITUTE of NAVIGATION, No.120, pp.45-50, 2009, ISSN 0388-74057
4. Investigation on the Factors of VTS Operators's Mental Workload: Case of Turkish Operators, The Proceedings of International Maritime Lecturers' Association 16th Conference on MET, 2008, pp.335-345, Dokuz Eylul university Publications, ISBN 978-975-441-256-7
5. " Field Factor in the Sea Traffic Related Human Factors" Proceedings of CIEVol.2, pp.D4-46-49CIE(Commission Internationale Bureau De L'eclairage) Central, 2007. ISBN 978 3 901 906 59 6

5.2.3 Polytechnical University of Catalonia, Faculty of Nautical Studies (Spain)

MENU :

1. GENERAL INFORMATION OF THE INSTITUTION
2. NATIONAL SYSTEM OF EDUCATION AND MET
3. ACADEMIC MARITIME EDUCATION
4. NON - ACADEMIC MARITIME EDUCATION
5. STRUCTURE OF INSTITUTIONS
6. DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY
7. STATISTICS OF NATIONAL MET
8. TRAINING SHIPS
9. STRUCTURE OF MARITIME PROGRAMS
10. OBT IN GDYNIA MARITIME UNIVERSITY SCHEME
11. ACADEMIC PERSONAL DATABASE

THE INSTITUTION:

FACULTY OF NAUTICAL STUDIES OF BARCELONA

1. INTRODUCTION

The Faculty of Nautical Studies of Barcelona (FNB) is a dynamic, modern research and teaching centre that has high-end facilities and a multidisciplinary team of experts in the fields of naval and maritime engineering and the nautical sciences.

The Faculty belongs to one of the most prestigious universities in Europe, the Polytechnic University of Catalonia (UPC).

The Faculty is now days the oldest of all the maritime schools and faculties of Spain.

The programs of studies satisfy both Spanish educational standards and the requirements of the Ministry according to the International Maritime Organization regulation.

2. NATIONAL SYSTEM OF THE EDUCATION AND MET

From the moment the Faculty was integrated into the UPC, the access to the different degrees taught is governed by the general rules in force in the country concerning the access to university.

The UPC academic and administrative standards of admission, registration, recognition and retention of students are applied.

The national system of education is as follows:

Infant Education		Primary school		
1st cycle	2nd cycle	1st cycle	2nd cycle	3rd cycle
3	6	8	10	12

Ages

Secondary school		High school	Pre-registration	
1st cycle	2nd cycle		Exam to access	
14	16	18		UNIVERSITY
	Or	Professional school		
	16	Maritime trying cycle		

From 2010, with the adaptation to the European Higher Education Area:

UNIVERSITY		
Degree 1st cycle	Master 2nd cycle	Ph. D
4	2	

YEARS

3. GENERAL INFORMATION OF THE INSTITUTION

The Faculty of Nautical Studies (FNB) is located in a central place next to the port of Barcelona, which constitutes an excellent location. The Faculty includes three buildings NT1, NT2 and NT3.

The main building (NT1) address is:
Pla de Palau,18
08003 Barcelona

Phone: 93.401.19.36
Fax: 93.401.79.10

E-Mail: informacio@fnb.upc.edu
Web Site www.fnb.upc.edu

The dock building (NT2) address is:
Marina Port Vell
08003 BARCELONA

And the attached building (NT3) address is:
Carrer Escar 6-8
08039 BARCELONA

The Faculty of Nautical Studies of Barcelona also has its own facilities in addition to those available in the rest of UPC.
These facilities include:

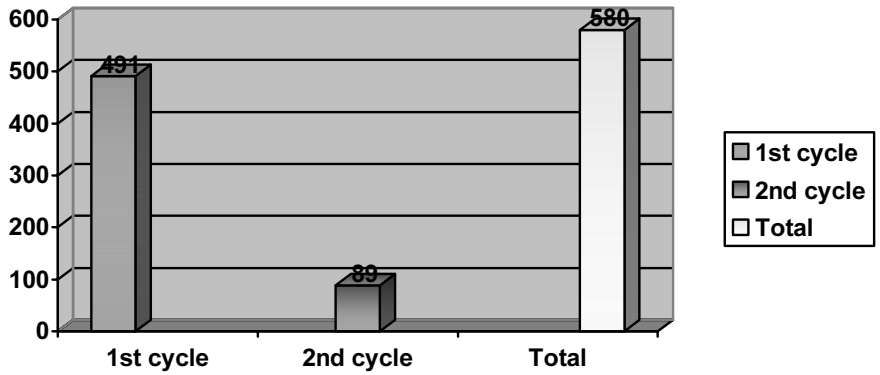
- Calculation centre
- Materials and chemistry laboratory
- Non-destructive test laboratory
- Electricity and electronics laboratory
- Mechanical technology workshop
- Machine room simulator
- Manoeuvring simulator
- Navigation simulator
- Special transport simulator
- Electronic Chart Display and Information System (ECDIS)
- FNB-CIMNE research room
- RADAR and ARPA simulators
- GMDSS radio communications simulator
- Auxiliary vessels and vessels for practical lessons
- Planetarium

There are ten teacher departments assigned to the Faculty, of which only the Department of Maritime Science and Engineering is based in the Faculty.

Those departments are:

- Department of Electrical Engineering (with 4 teaching staff)
- Department of Electronic Engineering (with 3 teaching staff)
- Department of Chemical Engineering (with 5 teaching staff)
- Department of Applied Physics (with 3 teaching staff)
- Department of Applied Mathematics (with 5 teaching staff)
- Department of Engineering Projects (with 2 teaching staff)
- Department of Systems Engineering, Automatic Control and Industrial Informatics (with 7 teaching staff)
- Department of Transport and Land Infrastructure (with 4 teaching staff)
- Department of Business Management (with 4 teaching staff)
- Department of Maritime Science and Engineering (with 38 teaching staff)

About the number of students, following the 2009 figures by cycle, about 580 students were registered in total as follows:



4. ACADEMICIANS PERSONAL DATABASE

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
DE MELO	GERMAN	Ph D	CHIEF ENGINEERING	PROFESSOR
PH:+34 93 4017777 EMAIL: demelo@fnb.upc.edu	Department of Maritime Science and Engineering			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
BOSCH	RICARD			PROFESSOR
PH:+34 93 4017913 EMAIL: bosch@ee.upc.edu	Department of Electrical Engineering			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
CLOSAS	LLUIS			PROFESSOR
PH:+34 93 4017916 EMAIL:closas@eel.upc.edu	Department of Electronic Engineering			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
ALEMAN	CARLOS E.			PROFESSOR
PH:+34 93 4017915 EMAIL: carlos.aleman@upc.edu	Department of Chemical Engineering			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
ISALGUE	ANTONI			PROFESSOR
PH:+34 93 4017914 EMAIL: antonio.isalgue@upc.edu	Department of Applied Physics			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
MACIA	RAMON			PROFESSOR
PH:+34 93 4017912 EMAIL: ramon.macia@upc.edu	Department of Applied Mathematics			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
HERNANDEZ	JOSE LUIS			PROFESSOR
PH:+34 93 4017919 EMAIL: jhernandez@pe.fnb.upc.edu	Department of Engineering Projects			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
MONTSENY	EDUARD			PROFESSOR
PH:+34 93 4017911 EMAIL: eduard.montseny@upc.edu	Department of Systems Engineering, Automatic Control and Industrial Informatics			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
ROBUSTE	FRANCESC			PROFESSOR
PH:+34 93 4017104 EMAIL: frobuste@upc.edu	Department of Transport and Land Infrastructure			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
SANCHEZ	ANNA M			PROFESSOR
PH:+34 93 4054446 EMAIL: anna.m.sanchez@upc.edu	Department of Business Management			

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	NAME	DEGREE	MARITIME LICENSE	ACADEMIC POSITION
RODRIGUEZ-MARTOS	RICARD	Ph D		PROFESSOR
PH:+34 93 4017932 EMAIL: rrodriguez@cen.upc.edu	Department of Maritime Science and Engineering			

5. MET PROGRAMS

The academic year 2010-2011 the Faculty of Nautical Studies of Barcelona begins with the new degrees adapted to the European Higher Eduaction Area.
They are the following:

■Degree in Nautical Engineering and Maritime Transport
■Degree in Marine Engineering
■Degree in Systems and Marine Engineering Technology

These new degrees will replace the 2000 curriculum degrees listed below:

■Diploma in Maritime Navigation (at the end of a first three-year cycle)
■Diploma in Marine Engineering (at the end of a first three-year cycle)
■Diploma in Ship Systems and Propulsion (at the end of a first three-year cycle)
■Bachelor's degree in Nautical Studies and Maritime Transport (at the end of a second two-year cycle)
■Bachelor's degree in Marine Engineering (at the end of a second two-year cycle)

The new courses by semesters will be as follows:

DEGREE IN NAUTICAL ENGINEERING AND MARITIME TRANSPORT

	Subjects	ECTS
Q1	Fundamentals of mathematics I	6
	Physics	9
	Graphic expression	6
	Computer science	6
	Maritime law	3
	TOTAL	30
Q2	Fundamentals of mathematics II	6
	Business management and organisation	6
	Chemistry	6
	Maritime technical English	6
	Maritime economy, shipping business and on board human resource management	6
	TOTAL	30
Q3	Coastal navigation	6
	Electricity and naval electronics	6
	Maritime medicine	3
	Technical English for maritime navigation	9
	Naval construction	6
	TOTAL	30
Q4	Ship stability	6
	Automatic regulation and control	4,5
	On board electronics aids to navigation	7,5
	Stowage	12
	TOTAL	30
Q5	Naval construction and ship stability	9
	Maritime safety and security	6
	Marine pollution prevention and sustainability	6
	Regulation, ship operation and logistics	9
	TOTAL	30
Q6	Astronomical navigation	6
	Radiocommunication	6
	Manoeuvring and regulations	9
	Routes and compasses	4,5
	Health and safety at work	4,5
	TOTAL	30
Q7	Transport of dangerous, hazardous and harmful goods	4,5
	Nautical meteorology and oceanography	7,5
	Optional credits	6
	Final thesis	12
	TOTAL	30
Q8	External training	30
	TOTAL	30

DEGREE IN MARINE ENGINEERING

	Subjects	ECTS
Q1	Fundamentals of mathematics I	6
	Physics	9
	Graphic expression	6
	Computer science	6
	TOTAL	27
Q2	Fundamentals of mathematics II	6
	Business management and organisation	6
	Chemistry	6
	Maritime technical English	6
	Mechanics and material resistance	9
	TOTAL	33
Q3	Mathematical methods for engineering	9
	Applied thermodynamics and thermotechnics	6
	Electricity and electrotechnics	6
	Mechanics technology	6
	Maritime medicine	3
	TOTAL	30
Q4	Materials science and technology	6
	Ship theory	6
	Fluid mechanics	6
	Naval construction	6
	Naval electronics	6
	TOTAL	30
Q5	Maritime Safety and security	6
	Marine pollution prevention and sustainability	6
	Automatic regulation and control	6
	Refrigerated and air conditioning installations	4,5
	Propulsion	4,5
	TOTAL	30
Q6	Marine turbomachines and steam generators	9
	Internal combustion engines	9
	Operation and maintenance of marine engines and systems	6
	Optional credits	6
	TOTAL	30
Q7	Transport of dangerous, hazardous and harmful goods	4,5
	Installations and maintenance	4,5
	Inspection and non-destructive testing	4,5
	Electric propulsion and power electronics	4,5
	Final thesis	12
	TOTAL	30
Q8	External training	30
	TOTAL	30

DEGREE IN SYSTEMS AND MARINE ENGINEERING TECHNOLOGY

	Subjects	ECTS
Q1	Fundamentals of mathematics I	6
	Physics	9
	Graphic expression	6
	Computer science	6
	TOTAL	27
Q2	Fundamentals of mathematics II	6
	Business management and organisation	6
	Chemistry	6
	Naval and mechanics technology	9
	Materials science and technology	6
	TOTAL	33
Q3	Mathematical methods for engineering	9
	Applied thermodynamics and thermotechnics	6
	Electricity and electrotechnics	6
	Mechanics applied to naval engineering	7,5
	TOTAL	28,5
Q4	Naval construction	6
	Ship stability	6
	Ship electric plant	4,5
	Naval equipment	3
	Fluid mechanics	6
	Naval electronics	6
	TOTAL	31,5
Q5	Propulsion	7,5
	Naval engines	9
	Structures applied to naval engineering	6
	Production organisation and project management	7,5
	TOTAL	30
Q6	Materials in the naval industry	7,5
	Naval structure numerical methods	4,5
	Quality management, safety, environment and sustainability	4,5
	Regulation and automatic control	4,5
	Naval system design	9
	TOTAL	30
Q7	Ship and naval artefacts design	9
	Installations and maintenance	4,5
	Inspection and non-destructive testing	4,5
	Optional credits	12
	TOTAL	30
Q8	Optional credits	6
	Final thesis	24
	TOTAL	30

The programme of the studies carried out the current year is as follows:

DEGREE IN NAUTICAL ENGINEERING AND MARITIME TRANSPORT

Q1	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics I	Mathematics in the engineering field: vectors, linear transformations, trigonometry, probability.	6	6		
	Physics	Modern physics: relativity, thermodynamic, electricity, magnetism.	9	9		
	Graphic expression	Technical representation of the ship. Cartography	6	6		
	Computer science	Data representation. Introduction to programming. Digital systems.	6	6		
	Maritime Law	International maritime law and administrative law	3	3		

Q2	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics II	Mathematical analysis: multiple integrals, sequences, numerical and function series, functions of several variables.	6	6		
	Business management and administration	Basic concepts of business and management techniques	6	6		
	Chemistry	Chemical elements, organic and inorganic compounds.	6	6		
	Maritime technical English	Maritime English: ship knowledge, safety equipment, charts, aids to navigation, ports.	6	6		
	Maritime economy, shipping and facilities management on board	Introduction to maritime economics, transport logistics and human resources in the shipping business	6	6		

DIPLOMA IN MARITIME NAVIGATION

Q3	Courses	Description	ECTS	Credits		
Code				Total	T	P
17336	Chemistry	Introduction to organic and inorganic chemistry		4,5	3	1,5
17337	Introduction to Automatic Control	Basic concepts and tools of naval automation systems		4,5	3	1,5
17338	Radio Communications	Maritime communications. Radiolocation systems. Satellite communications		6	3	3
17339	Ship Safety and Pollution Prevention	Shipboard emergencies. Drills. Search and rescue. Pollution prevention.		12	6	6
	Compulsory credits			27		
	Optional credits			4,5	3	1,5
	Elective credits			4,5	3	1,5
	TOTAL credits			36	21	15

Q4	Courses	Description	ECTS	Credits		
Code				Total	T	P
17340	Positional Astronomy and Astronomical Navigation	Determination of position at sea by use of celestial bodies. Calculation of angles and times of astronomical phenomena.		6	3	3
17341	Navigation Law	Legal system of freight transport, bill of lading, credits and insurances.		6	4,5	1,5
17342	Electrotechnics	Electrical circuit analysis. Protection of electrical installations		9	5	4
17343	Manoeuvring Codes and Regulations	Introduction to manoeuvre and government. Maritime rules and codes		7,5	4,5	3
	Compulsory credits			28,5		
	Optional credits			4,5	3	1,5
	Elective credits			6	3	3
	TOTAL credits			39	23	16

Q5	Courses	Description	ECTS	Credits		
Code				Total	T	P
17344	Naval Electronics	Ship's electronic systems. Analogical and digital circuits.		4,5	3	1,5
17345	Stowage	Carriage of goods and port operations. Special cargo handling.		6	3	3
17346	Navigation Instrumentation and Equipment	RADAR, ARPA, GPS		4,5	3	1,5
17347	Meteorology and Oceanography	Introduction to: atmosphere, temperature, depressions, humidity, currents, waves, ice.		7,5	4,5	3
	Compulsory credits			22,5		
	Optional credits			7,5	4,5	3
	Elective credits			7	4	3
	TOTAL credits			37	22	15

Q6	Courses	Description	ECTS	Credits		
Code				Total	T	P
17348	Onboard Practice	Training on board		12		12
17427	Final Project	Developing of main subjects		9		9
	Compulsory credits			21		
	Optional credits			5	3	2
	Elective credits			4,5	3	1,5
	TOTAL credits			30,5	6	24,5

	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Compulsary	34,5	39	27	28,5	22,5	21	172,5
Optional			4,5	4,5	7,5	5	21,5
Elective			4,5	6	7	4,5	22
TOTAL	34,5	39	36	39	37	30,5	216

DEGREE IN MARINE ENGINEERING

Q1	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics I	Mathematics in the engineering field: vectors, linear transformations, trigonometry, probability.	6	6		
	Physics	Modern physics: relativity, thermodynamic, electricity, magnetism.	9	9		
	Graphic expression	Technical representation of the ship. Parts and Mechanisms	6	6		
	Computer science	Data representation. Introduction to programming. Digital systems.	6	6		

Q2	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics II	Mathematical analysis: multiple integrals, sequences, numerical and function series, functions of several variables.	6	6		
	Business management and administration	Basic concepts of business and management techniques	6	6		
	Chemistry	Chemical elements, organic and inorganic compounds.	6	6		
	Mechanics and materials resistance	Introduction to mechanisms: balances, efforts, tensions and deformations	9	9		
	Maritime technical English	Maritime English: ship knowledge, safety, engineering and documents.	6	6		

DIPLOMA IN MARINE ENGINEERING

Q3	Courses	Description	ECTS	Credits		
Code				Total	T	P
17359	Fundamentals of Automatic Control	Basic concepts and tools of naval automation systems		4,5	3	1,5
17360	Fundamentals of Naval Construction	Identification of ship's elements and zones. Types of vessels. Mechanic propulsion. Cavitations		12	6	6
17361	Technology and Mechanical Processes	Get use to different tools, workshops, welding.		7,5	4,5	3
17362	Thermal Technology and Fluid Mechanics	Heat transfer. Thermal systems. Fluid dynamics.		6	4,5	1,5
17363	Steam and Gas Turbines	Steam and gas engines. Action and reaction turbines.		6	3	3
	Compulsory credits			36		
	Optional credits					
	Elective credits			4,5	2	2,5
	TOTAL credits			40,5	23	17,5

Q4	Courses	Description	ECTS	Credits		
Code				Total	T	P
17364	Maritime Law	International maritime law and administrative law		7,5	4,5	3
17365	Steam Generators	Type of steam generators, fuel, burners, marine boilers. Operation and maintenance		6	4,5	1,5
17366	Electric Machines and Installations	Operation of electric machines and different electric installations		4,5	3	1,5
17367	Internal Combustion Engines	Type of internal combustion engines and installations. Calculations		6	3	3
	Compulsory credits			24		
	Optional credits			10,5	5	5,5
	Elective credits			6	2	4
	TOTAL credits			40,5	22	18,5

Q5	Courses	Description	ECTS	Credits		
Code				Total	T	P
17368	Naval Electronics	Ship's electronic systems. Analogical and digital circuits.		4,5	3	1,5
17369	Refrigerated Installations	Refrigeration cycles, installations, cooling systems. Freezer ships		4,5	3	1,5
17370	Ship Maintenance and Auxiliary Systems	Maintenance of installations. Breakdowns. Auxiliary ship systems.		10,5	6	4,5
17371	Ship Safety and Pollution Prevention	Shipboard emergencies. Drills. Search and rescue. Pollution prevention.		9	7,5	1,5
	Compulsory credits			28,5		
	Optional credits			6	3	3
	Elective credits			6	3	3
	TOTAL credits			40,5	25,5	15

Q6	Courses	Description	ECTS	Credits		
Code				Total	T	P
17372	Onboard Practice	Training on board		6		6
17428	Final Project	Developing of main subjects		9		9
	Compulsory credits			15		
	Optional credits			6	3	3
	Elective credits			6	3	3
	TOTAL credits			27	6	21

	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Compulsary	39	31,5	36	24	28,5	15	174
Optional				10,5	6	6	22,5
Elective			4,5	6	6	6	22,5
TOTAL	39	31,5	40,5	40,5	40,5	27	219

DEGREE IN SYSTEMS AND MARINE ENGINEERING TECHNOLOGY

Q1	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics I	Mathematics in the engineering field: vectors, linear transformations, trigonometry, probability.	6	6		
	Physics	Modern physics: relativity, thermodynamic, electricity, magnetism.	9	9		
	Graphic expression	Technical representation of the ship. Parts and Mechanisms	6	6		
	Computer science	Data representation. Introduction to programming. Digital systems.	6	6		

Q2	Courses	Description	ECTS	Credits		
Code				Total	T	P
	Fundamentals of mathematics II	Mathematical analysis: multiple integrals, sequences, numerical and function series, functions of several variables.	6	6		
	Business management and administration	Basic concepts of business and management techniques	6	6		
	Chemistry	Chemical elements, organic and inorganic compounds.	6	6		
	Naval and Mechanics Technology	Manufacturing processes: metals, tools, metrology, welding, mechanization	9	9		
	Materials Science and Technology	Introduction to different materials, their selection and behaviour assessment	6	6		

DIPLOMA IN SHIP SYSTEMS AND PROPULSION

Q3	Courses	Description	ECTS	Credits		
Code				Total	T	P
17383	Fundamentals of Automatic Control	Basic concepts and tools of naval automation systems		4,5	3	1,5
17384	Fundamentals of Naval Construction	Identification of ship's elements and zones. Types of vessels. Mechanic propulsion. Cavitations		12	6	6
17385	Technology and Mechanical Processes	Get use to different tools, workshops, welding.		7,5	4,5	3
17386	Thermal Technology and Fluid Mechanics	Heat transfer. Thermal systems. Fluid dynamics.		6	4,5	1,5
17387	Steam and Gas Turbines	Steam and gas engines. Action and reaction turbines.		6	3	3
	Compulsory credits			36		
	Optional credits					
	Elective credits			4,5	2	2,5
	TOTAL credits			40,5	23	17,5

Q4	Courses	Description	ECTS	Credits		
Code				Total	T	P
17388	Maritime and Administrative Law	International maritime law and administrative law		7,5	4,5	3
17389	Steam Generators	Type of steam generators, fuel, burners, marine boilers. Operation and maintenance		6	4,5	1,5
17390	Electric Machines and Installations	Operation of electric machines and different electric installations		4,5	3	1,5
17391	Internal Combustion Engines	Type of internal combustion engines and installations. Calculations		6	3	3
	Compulsory credits			24		
	Optional credits			10,5	5	5,5
	Elective credits			4,5	2	2,5
	TOTAL credits			39	22	17

Q5	Courses	Description	ECTS	Credits		
Code				Total	T	P
17392	Naval Electronics	Ship's electronic systems. Analogical and digital circuits.		4,5	3	1,5
17393	Refrigerated Installations	Refrigeration cycles, installations, cooling systems. Freezer ships		4,5	3	1,5
17394	Ship Maintenance and Auxiliary Systems	Maintenance of installations. Breakdowns. Auxiliary ship systems.		10,5	6	4,5
17395	Projects	Ship's project techniques, form design, resistance, propulsion, stability.		6	3	3
	Compulsory credits			25,5		
	Optional credits			4,5	3	1,5
	Elective credits			9	6	3
	TOTAL credits			39	24	15

Q6	Courses	Description	ECTS	Credits		
Code				Total	T	P
17396	Maritime Safety	Shipboard emergencies. Drills. Search and rescue. Pollution prevention.		6	4,5	1,5
17397	Final Project	Developing of main subjects		16,5		16,5
	Compulsory credits			22,5		
	Optional credits			9	6	3
	Elective credits			4,5	3	1,5
	TOTAL credits			36	13,5	22,5

	Q1	Q2	Q3	Q4	Q5	Q6	TOTAL
Compulsary	39	31,5	36	24	25,5	22,5	178,5
Optional				10,5	4,5	9	24
Elective			4,5	4,5	9	4,5	22,5
TOTAL	39	31,5	40,5	39	39	36	225

DEGREE IN NAUTICAL STUDIES AND MARITIME TRANSPORT

Q1	Courses	Description	ECTS	Credits		
Code				Total	T	P
17398	Technical English for Maritime Navigation	Increase knowledge on English communication. Maritime insurance.		6	3	3
17399	Naval Automation	Automatic control, industrial control strategies		6	4,5	1,5
17400	Maritime Navigation	Magnetic compass, gyrocompass. Planning of routes		12	4,5	7,5
17401	Ship Theory	Buoyancy, stability, stranding, compartment, flooding.		9	4,5	4,5
17402	Maritime Transport and Stowage	Transport and handling of special goods		6	4,5	1,5
	Compulsory credits			39		
	Optional credits					
	Elective credits					
	TOTAL credits			39	21	18

Q2	Courses	Description	ECTS	Credits		
Code				Total	T	P
17403	Naval Construction and Mechanics	Ship structure. Naval construction. Maintenance		7,5	4,5	3
17404	Marine Vehicle Dynamics	Vibrations. Rolling and pitch. Control of ship behaviour		6	3	3
17405	Computing and Communications Networks	Communication and computing networks. Programming.		4,5	3	1,5
17406	Transport Navigation, Organization and Planning	Organization of transport and shipping company. Ship contracts		12	6	6
17407	Shipping Regulations and Operations	Seaworthiness concept. Environmental impact of maritime transport		6	4,5	1,5
	Compulsory credits			36		
	Optional credits					
	Elective credits			4,5	3	1,5
	TOTAL credits			40,5	24	16,5

Q3	Courses	Description	ECTS	Credits		
Code				Total	T	P
17408	Meteorological Analysis and Forecast	Interpretation of meteorological information. Turbulences, winds. Predictions		6	4,5	1,5
17409	Applied Manoeuvring	Design, planning and execution of manoeuvres. Critical situations.		6	3	3
17410	Radioelectronic Systems to aid Navigation	GPS and radionavigation systems: Omega, Decca, Loran C		6	3	3
17411	Maritime Safety and Pollution Prevention	Security policy at the EU. Protection of the ship and maritime installations		7,5	4,5	3
17431	Hydrodynamics, Resistance and Marine Propulsion	Friction resistance effects. Waves models. Restricted water effects. Propeller geometry.		6	3	3
	Compulsory credits			31,5		
	Optional credits					
	Elective credits			10,5	6	4,5
	TOTAL credits			42	24	18

Q4	Courses	Description	ECTS	Credits		
Code				Total	T	P
17412	Onboard Practice	Training on board		6		6
17429	Final project	Developing of main subjects		7,5		7,5
	Compulsory credits			13,5		
	Optional credits			15	8	7
	Elective credits					
	TOTAL credits			28,5	8	20,5

	Q1	Q2	Q3	Q4	TOTAL
Compulsary	39	36	31,5	13,5	120
Optional				15	15
Elective		4,5	10,5		15
TOTAL	39	40,5	42	28,5	150

DEGREE IN MARINE ENGINEERING

Q1	Courses	Description	ECTS	Credits		
Code				Total	T	P
17413	Applied Information Technology	Communication and computing at the ship. Programming		4,5	3	1,5
17414	Numerical Methods	Application of numerical methods. Mathematical modeling		6	3	3
17415	Maintenance Technology	Regulation and standardization. Machine elements calculation. Optimization		10,5	4,5	6
17416	Maritime Safety and Pollution Prevention	Security policy at the EU. Protection of the ship and maritime installations		6	4,5	1,5
17417	Onboard Electrical Systems	Electricity on board: from its generation to its consumption		7,5	4,5	3
	Compulsory credits			34,5		
	Optional credits			4,5	3	1,5
	Elective credits					
	TOTAL credits			39	22,5	16,5

Q2	Courses	Description	ECTS	Credits		
Code				Total	T	P
17418	Maritime Auxiliary Systems	Types of auxiliary systems and its elements. Functions		9	6	3
17419	Fluid Mechanics and Thermal and Hydraulic Turbomachines	Real steam cycles. Performance and lost in turbines. Optimization of steam installations		10,5	6	4,5
17420	Control and regulation of Electrical Machines	Automatic control, industrial control strategies.		9	4,5	4,5
17421	Onboard Electronic Systems	Electronic control of engines. Sensors. Maintenance		4,5	3	1,5
	Compulsory credits			33		
	Optional credits					
	Elective credits			6	3	3
	TOTAL credits			39	22,5	16,5

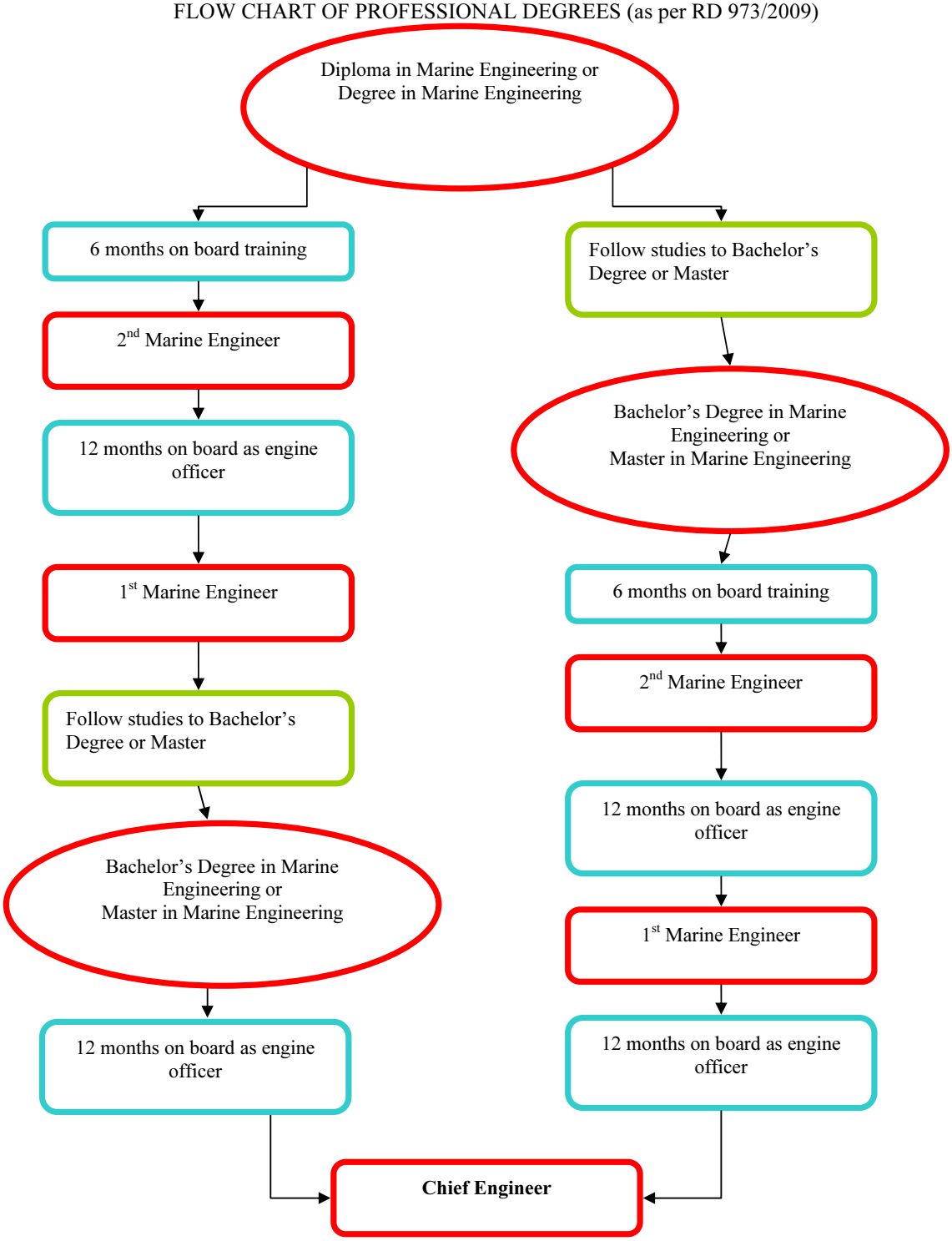
Q3	Courses	Description	ECTS	Credits		
Code				Total	T	P
17422	Business Management	Introduction to shipping business		4,5	3	1,5
17423	Heat Engines	Characteristics of heat engines. Performance and power		6	4,5	1,5
17424	Ship Administration and Maintenance	Maintenance organization. Non-destructive tests		10,5	6	4,5
17425	Onboard Energy Technology	Analysis of energy saving on ship installations. Energetic plants.		12	9	3
	Compulsory credits			33		
	Optional credits			6	3	3
	Elective credits					
	TOTAL credits			39	25,5	13,5

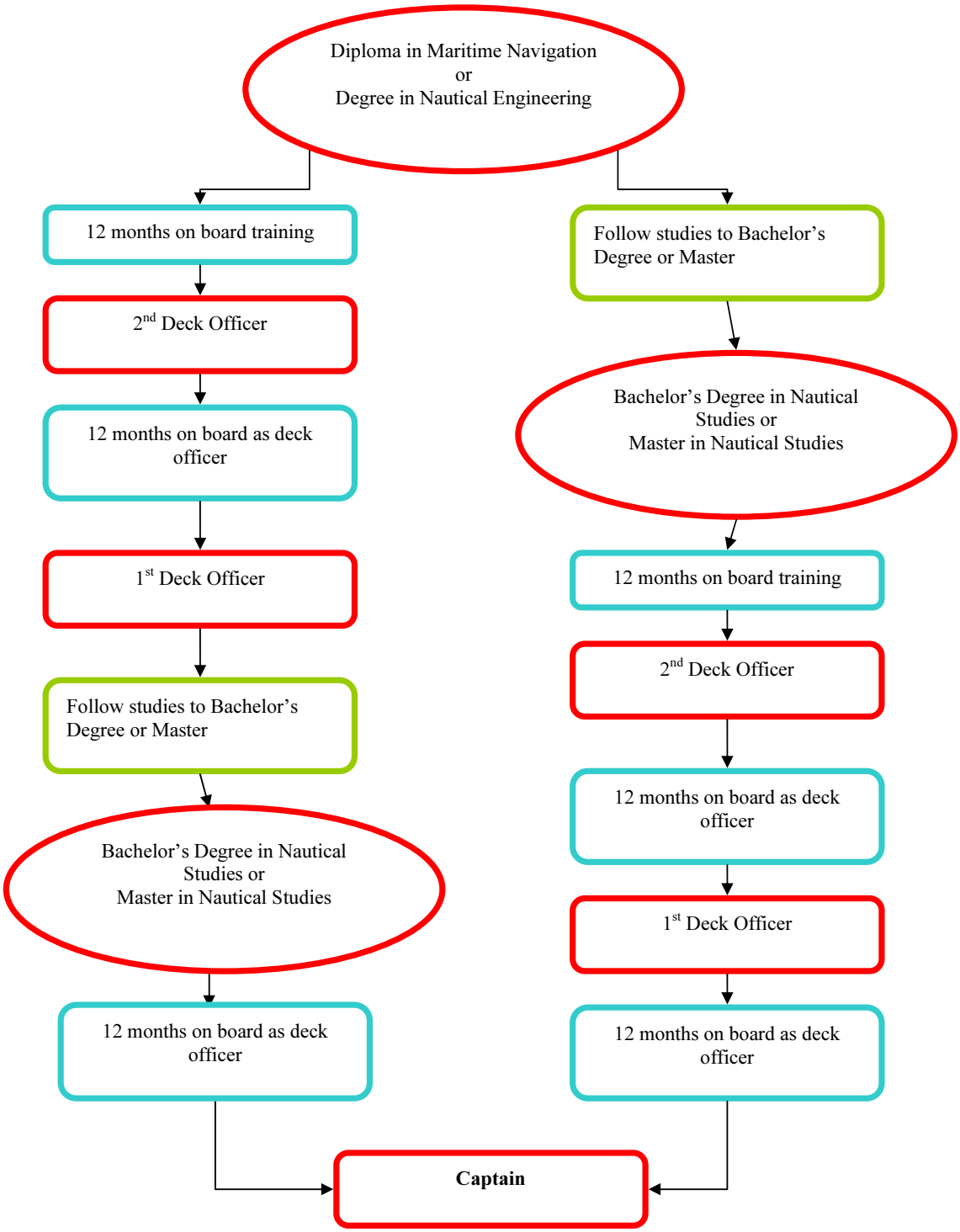
Q4	Courses	Description	ECTS	Credits		
Code				Total	T	P
17426	Onboard Practice	Training on board		12		12
17430	Final project	Developing of main subjects		7,5		7,5
	Compulsory credits			19,5		
	Optional credits			4,5	3	1,5
	Elective credits			9	6	3
	TOTAL credits			33	9	24

	Q1	Q2	Q3	Q4	TOTAL
Compulsary	34,5	33	33	19,5	120
Optional	4,5		6	4,5	15
Elective		6		9	15
TOTAL	39	39	39	33	150

6. OBT SCHEME

FLOW CHART OF PROFESSIONAL DEGREES (as per RD 973/2009)

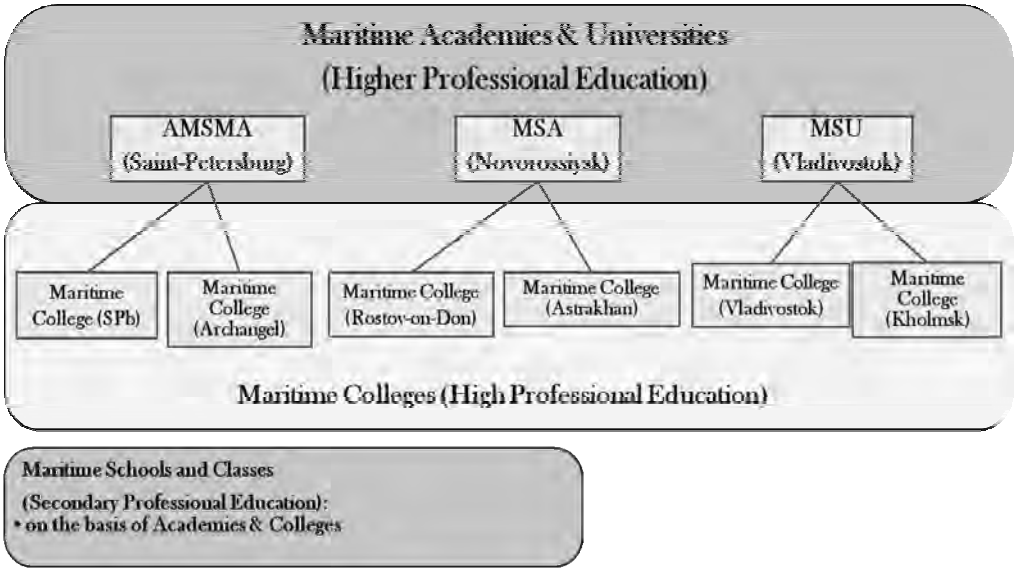



Diploma in Maritime Navigation
or
Degree in Nautical Engineering
12 months on board training
2nd Deck Officer
12 months on board as deck officer
1st Deck Officer
Follow studies to Bachelor's Degree or Master
Bachelor's Degree in Nautical Studies or Master in Nautical Studies
12 months on board as deck officer
Follow studies to Bachelor's Degree or Master
Bachelor's Degree in Nautical Studies or Master in Nautical Studies
12 months on board training
2nd Deck Officer
12 months on board as deck officer
1st Deck Officer
12 months on board as deck officer
Captain

5.2.4 Admiral Makarov State Maritime Academy (Russia)

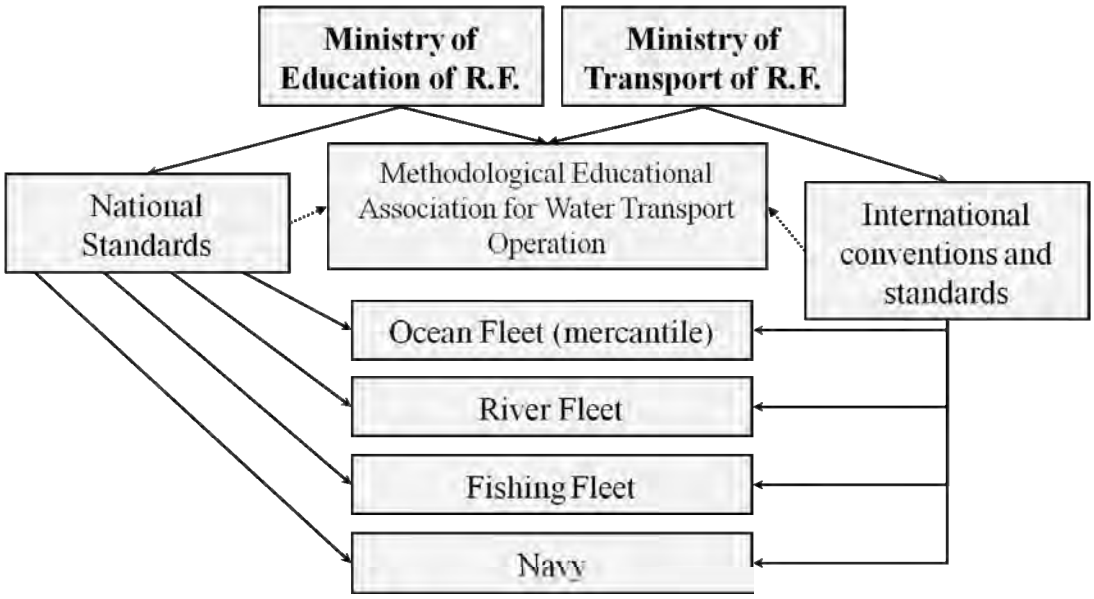
ADMIRAL MAKAROV STATE MARITIME ACADEMY
(AMSMA)

NATIONAL SYSTEM OF THE EDUCATION AND MET IN RUSSIA



TRAINING IN WATER TRANSPORT SPECIALITIES

The peculiarity of the Higher Maritime Educational Establishments is the so called double subordination. On the on hand in the area of general education there are subordinate to the Ministry of Education, which ensures that education meets national standards. On the other hand it is subordinate to the MoT, which ensures conformity of professional training to Int. conventions.



GENERAL INFORMATION OF AMSMA

Name of the Institution: Admiral Makarov State Maritime Academy
Rector: **Valery L. Mikheev**
Address: 15A Kosaya Linia, V.O., Saint Petersburg, 199106, Russia
Phone number: +7 812 322 06 82
Fax: +7 812 322 07 82
URL: http://www.gma.ru/
E-mail: oms@gma.ru

Federal State Educational Establishment of Higher Professional Education "**Admiral Makarov State Maritime Academy**" (AMSMA) conducts training programs of higher, secondary, postgraduate and additional professional education.

Admiral Makarov State Maritime Academy is the leading maritime educational institution in Russia, a major center of marine science, the acknowledged center of postgraduate education and professional training of seafarers. AMSMA, as a basic educational institution of the industry, not only trains specialists of the fleet, that is very significant itself, but also provides guidance on engineering degree for water transport.

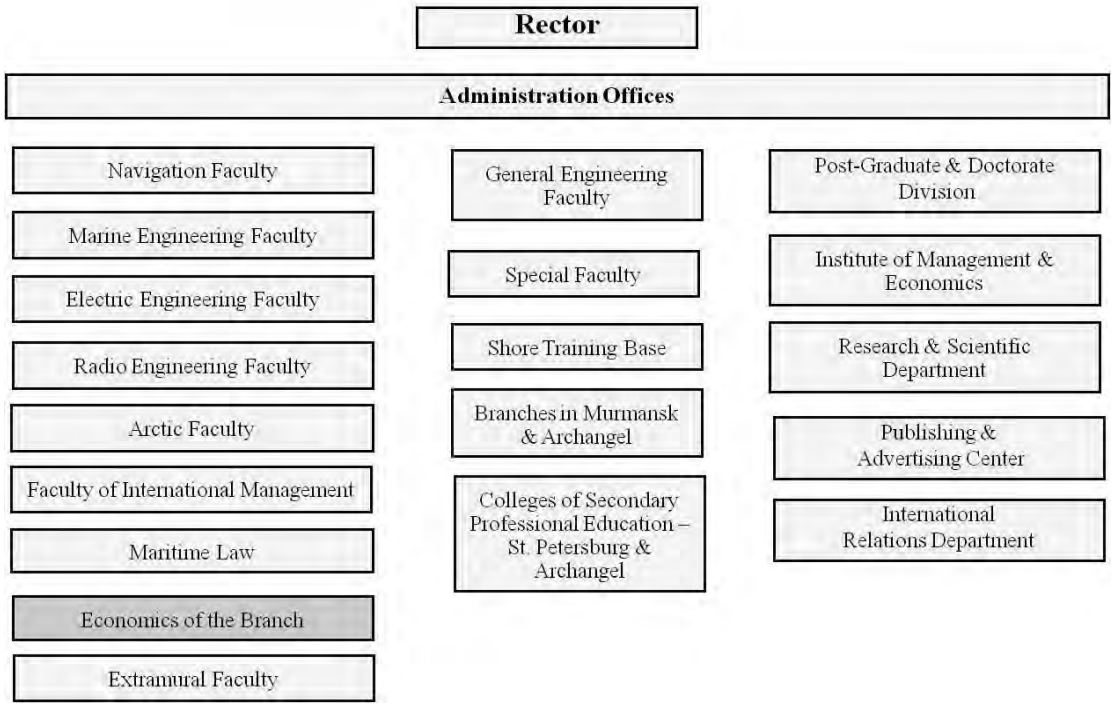
The specificity of our educational institution is that the training for maritime transport is conducted in accordance with State Educational Standards in compliance with the requirements of the Standards of Training, Certification and Watch-keeping (STCW 78/95) of the International Maritime Organization (IMO).

Training programs of AMSMA have an official international recognition. In 1994 the Academy passed the certification of the IMO Department of Education and Certification having got high ratings of the expert group. The departments and individual training courses are accredited by the Maritime Administration of Norway, the International Hydrographic Bureau Advisory Board FIG/IHB (Monaco). In 1998 the Academy joined the Association of Colleges of Marine Radio and Electronics UK. AMSMA is a member of the International Association of Maritime Universities (IAMU).

STRUCTURE OF AMSMA

Higher professional education

The Academy has eight faculties of higher professional education: Navigation, Marine Engineering, Electric Engineering, Radio Engineering, Arctic, International Transport Management, Economics, and Law.



LIST OF SPECIALTIES

Navigation Faculty trains engineers in specialty "Navigation". Graduates of the Faculty, according to the maritime community, get one of the best navigation training in the world. Practical training of navigators meets the requirements of the international conventions and national documents on marine education. Cadets, who successfully mastered the curriculum and program practices, get an engineering degree and the Certificate of Competence of an Officer in Charge of a Navigational Watch.
Duration of training - 5 years and 6 months.

Marine Engineering Faculty trains engineers specializing in operation of ship power plants. There are specializations: "Ship power plants operation" and "Nuclear power plants operation". The educational program in addition to the theoretical training includes the practice: technological and wiring at the Academy workshops, seagoing (total duration no less than 8 months).
All graduates of the Faculty receive an engineering degree and the Certificate of Competency of Officer of Engineering Watch of Category A, which has international status and enable to work on ships of Russian and foreign companies.
Higher education and practical training enable the graduates without additional training to hold the position of a watch engineer, second and chief engineer of large-capacity vessels, a position of technical superintendent of a shipping company.
Duration of training - 5 years and 6 months.

Electric Engineering Faculty trains electrical engineers in three specializations: "Operation of ship's electrical and automatic equipment", "Operation of electrical and automatic equipment on nuclear powered ships" and "Operation of measuring and control complexes on nuclear powered ships".
Future electrical engineers study the theoretical basis of electro technology, automation, electronics, computer engineering, electrical machinery, the theory of ship's electric power systems, marine power systems, and electrical propulsion plants operation. The level of theoretical and practical training enable graduates to obtain the Certificate of Competence of the Marine Electro-Engineer.
Duration of training - 5 years and 6 months.

Radio Engineering Faculty trains broad engineering specialists in the specialty: "Technical operation of transport radio equipment". The Faculty also offers narrower specializations such as: "International information and telecommunication transport systems" and "Radio communication and electroradionavigation in the merchant marine."
Future radio engineers, along with the technical disciplines, learn English, receive training in computer and telecommunication technologies, satellite communications and navigation, information support for transportation.
The level of theoretical and practical training allows the graduates of the Faculty, along with the degree of radio engineer to get the Certificate of Competence of the 2nd class Radio Operator.
Duration of training - 5 years and 6 months.

Arctic Faculty trains engineers specializing in hydrography and navigational support. Future engineers study hydrographs seabed, soils and other navigation objects, explore sea routes, ensure safety of navigation, prepare materials for the mapping and publication of nautical charts and other manuals, are engaged in environmental research in the seas and the environmental protection.
Duration of training - 5 years and 6 months.

Faculty of International Transport Management provides training of engineers specializing in organization of transport and transport management with specializations "Management of sea transport" and "Management of transport systems and logistics".
Academic curricula of the Faculty combine theoretical training and practical experience in transport companies and onboard the ships. During the training cadets study the operational, administrative and economic disciplines, allowing to obtain more in-depth training in the following areas: multi-modal transport and transport logistics, organization and management on sea transport, foreign trade

operations and transportation services, legal and commercial work on transport, transport policy and strategic management.
The graduates of the Faculty work in shipping, stevedoring, broker, surveyor, agents and freight forwarding companies, transportation departments of foreign trade companies and other enterprises related to the foreign trade transportation.
Duration of training - 5 years.

Faculty of Economics trains bachelors in economics and masters in programs “Economics of the firm and sectorial markets”, "International business and economics of water transport", "Economics of cruising”.
Duration of study:
- in the direction of bachelor’s degree in Economics - 4 years;
- in the direction of master’s degree in Economics - 2 years.

Faculty of Law was established in 2009 with the aim of specialists training in the field of transport and maritime law. Within the specialty "Jurisprudence" cadets (students) are trained in three specializations: international law, public law and civil law. Specialization begins from their third year of study.
Duration of full-time training - 5 years.
In the area of “Jurisprudence” (bachelor) the specializations are provided in accordance with the profiles.
Duration of study - 4 years.
The Special Branch "Second Higher Education" is designed for people with higher non-legal education.
Education period – 3 years and 6 months (7 semesters).
Types of study – evening (part-time) and correspondence.
The specialization starts from the 4th semester and includes in-depth study of the selected areas in special courses and seminars. The training is provided on a contractual basis. Contracts for specialists training may be concluded with the enterprises, institutions and organizations of any form of ownership, as well as citizens.

The cadets of the first and second courses of all specialties are trained together at **General Engineering Faculty**, which consists of seven departments: Higher Mathematics, Physics and Chemistry, Theoretical Mechanics, History and Culture, Philosophy and Psychology, English, Physical Education and Sport.

Students-foreigners entering Navigation, Marine Engineering, Electric Engineering, Radio Engineering, Arctic Faculties assume the obligation to issue the seaman's passport (seaman’s ID) required for sea service in the State of habitual residence. The terms of providing places for sea service are coordinated with a student-foreigner in the contract for admission to the Academy.

Extramural Faculty conducts training on the basis of full-time faculties of all maritime transport specialties.
Duration of training for all specialties – 6 years.

Secondary professional education

Training in the secondary professional education is carried out at **V.I.Voronin Arctic Maritime Institute** (branch of the Academy in Arkhangelsk) and **Maritime College** (St. Petersburg).

Arctic Marine Institute in Arkhangelsk trains: technicians-navigators with a degree in “Marine Navigation”, technicians-mechanics with a degree in “Operation of transport power plants”, technicians specializing in “Facilities of mechanization and automation”.
Duration of study:
- after 9-10 classes - 3 years and 10 months;

- after general secondary education - 2 years and 10 months.
The Institute also carries out a set of training program of higher education by correspondence courses in specialties: “Navigation”, “Operation of ship’s power plants”, “Operation of ship’s electrical and automatic equipment”, “Organization of transport and transport management”.

Maritime College provides training: technicians-navigators with a degree in “Marine Navigation”, technicians-mechanics of specialty “Operation of transport power plants”, technicians specializing in “Organization of transport and transport management”, technicians specializing in “Operation of ship’s electrical and automatic equipment”.
Duration of study:
- after 9-10 classes - 3 years and 10 months;
- after general secondary education - 2 years and 10 months.

Structure of Programs (Topics/Hours/OBT)

Curricula for 2009-2010 academic year at Admiral Makarov State Maritime Academy

Campus	Faculty	Course	Months	September					October				November				December				January					February				March				April				May					June					July				August				September				
			Monday	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27
			Saturday	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2
			Number of a week	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
			week	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e	o	e
Campus-4 (Strelna)	GEF 1st course	NF	С 111-116	о/п	о/п													X	X	X																					X	X	X	W	W	W	W	W	W	W	W									
		AF	Г-121, 122	о/п	о/п													X	X	X																					X	X	X	W	W	W	W	W	W	W										
		MEF	М 151-154(я)	о/п	о/п														X	X																					x	x	x							a	a	A	A	A	A					
		EEF	Э 131, 132	о/п	о/п														X	X																					x	x	x	a	a	A	A	A	A											
		REF	Р 141, 142	о/п	о/п														X	X																					x	x	X			Пк	Пк	Пк	Пк	Пк	Пк									
	GEF 2nd course	NF	С 211-216															X	X	X																		X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	
		AF	Г 221, 222															X	X	X																					X	X	X	W	W	W	W	W	W	W	W	W	W	W	W					
		MEF	М-251-254(я)															X	X	X																			X	X	W	W	W	W	W	W					W	W	W	W	W	W	W	W	W	W	W
		EEF	Э 231, 232															X	X	X																				X	X	X	W	W	W	W	W	М	М											
		REF	Р 241, 242															X	X	X																				X	X	X				W	W	W	W											
	AF	III	Г 321, 322																X	X																					X	X	X	W	W	W	W	W	W	W										
		IV	Г 421,422															X	X	X																					X	X	X	W	W	W	W	W	W	W	W	W								
		V	Г 521,522															X	X	X																					X	X	Гк	Гк	W	W	W	W	W	W	W									
		VI	Г 621		W	W	W	W	W	W	W	W	П	П	П	П	П	П	П	П	П	В																																					
Campus-1 (Kosaya Liniy	ITMF	I	У 161-164	о/п	о/п																			X	X	X																		X	X	X	A		A		A		A		A					
			У-165	о/п	о/п																			X	X																			X	X	X							A	A	A	A	A				
		II	У 261-264	A	A																			X	X	X																			X	X	X	W	W	W										
			У 265	A	A																			X	X	X																			X	X	X	W	W											
		III	У361-364																					X	X	X																			X	X	W	W	W	W	W	W								
			У 365																					X	X	X																			X	X	X	W	W											
		IV	У 461-464																					X	X	X																	X	X	X	W	W	W	W	W	W	W	W	W								
		V	У 561-563															X	X	X				Гк	W	W	W	W	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	Гк	Гк													
Campus- 2 (Okhta)	NF	III	С 311-315	W	W	W	W	W	W																					X	X	X																X	X	X	A									
		IV	С 411- 415															X	X	X																	X	X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W						
		V	С 511- 515																				X	X	X	Тп	Тп	Тп	Тп	Тп	Тп	П	П	П	П	П					W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W
		VI	С 611-614	W	W	W	W	W	W	П	П	П	П	Тп	Тп	Тп	Гк	Гк	Гк	Гк			П	П	Пт	Пт	Пт	Пт	В																															
	REF	III	Р 341															X	X	X																			X	X	X	W	W	W	W	W	W	W	W	W	W								
		III	Р 342															X	X	X																			X	X	X			W	W	W	W	W	W	W	W								
		IV	Р 441, 442																						X	X	X																			X	X	X												
		V	Р 541, 542																X	X			Гк	Гк																	X	X	X	W	W	W	W	W	W	W	W	W	W	W	W					
		VI	Р 641, 642				Гк	Гк	W	W	W	W	W	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	Гк	В																														
Campus- 3 (21st Liniya)	MEF	III	М 351-354(я)	W	W	W	W	W	W	W	W																		X	X	X																X	X	X											
		III	М 355у																							X	X	X																				X	X	X											
		IV	М 451-453																							X	X	X																				X	X	X											
		IV	М 454я																				X	X	X																		X	X	W	W	W	W	W	W	W	W									
		IV	М455-У											X	X	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	П	П	П	П	П	П	П	П	П	П	П	П	В											
		V	М 551-553																										X	X	X	X						W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	
		V	М 554я																												X	X	X	X						W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	
		VI	М 651- 654я	W	W	W	W	W	W	W	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	П	Гк	Гк	Гк	Гк																													
	EEF	III	Э 331, 332я																X	X																										X	X	X	W	W	W									
		IV	Э 431, 432я																								X	X	X																					X	X	X								
		V	Э 531, 532я	W	W	W	W	W	W																					X	X	X										X	X	Гк	Гк						W	W	W	W	W	W	W	W	W	W	W
		VI	Э 631, 632я	W	W	W	W	W	W	W	W	П	П	П	П	П	П	П	П	П	П	П	П	Гк	В																																		
Campus-5 (Maritime College)	NF	I	111,112																																						x	x																		
		II	121, 122																	X																			X	X	W	W	W	W	W	W	W	W	W	W									
		III	131, 132	W	W	W	W	W																			X												X	W	W	W	W	W	W	W	W	W	W	W	W									
		IV	141	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W													X	Тп	Тп	Тп	Тп	Тп	Тп	Тп	X	Гк	Гк	Гк														
	MEF	I	511																																						x	x																		
		II	521, 522																	X																							X	W	W	W	W	W	W											
		III	531																	X				W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W											
		IV	541, 542	W	W	W	W	W	W											X				W	W	W	W																X	X	Гк	Гк														
	ITMF	I	311																																						x	x																		
		II	321, 322																	X																		X			W	W	W	W	W	W	W	W	W	W	W								
		III	331, 332																	X																			X	W	W	W	W	W	W	W	W	W	W										
		IV	341, 342																	X				W	W	W	W	W	W	W	W	W								X	X	X	Гк	Гк																
Faculty		Course	Monday	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	26	27
			Saturday	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2
			Number of a week	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
			Month	September					October				November				December				January					February				March				April				May					June					July				August				September				

Semester · X Exams · W Practice · П Diploma work · Тп Simulator training

A Guard · Пк Admission Board · Vacations · Гк Final attestation · В Graduation

Head of Education Department Nikolay Bozhuk

Curriculum
Specialty "Navigation"

№	Disciplines	All disciplines are subjected to be studied on brief program (hour)
A set of the Humanities & social-economical disciplines		
1	English	340
2	Physical training	408
3	Russian History	84
4	Cultural studies	108
5	Law	56
6	Psychology, pedagogics	90
7	Philosophy	114
8	Economics	60
9	Maritime English	270
	Total:	**1530**

	1. Disciplines for choice	
1	Political science	90
2	Sociology	90
	Total:	**90**

	2. Disciplines for choice	
1	Psychological basis of collective management	90
2	Conflict management	90
	Total:	**90**

	3. Disciplines for choice	
1	Maritime law	90
2	Economy of shipping	90
	Total	**90**

	TOTAL IN THE BLOCK:	**1800**
A set of mathematics and natural science		
1	Mathematics	612
2	Computer and information science	204
3	Physics	425
4	Chemistry	136
5	Ecology	68

6	Mathematical fundamentals of specialty	150
	Total:	**1595**

	1. Disciplines for choice	
1	Geography of water ways	61
2	Ecological aspects of shipping	61
	Total:	**61**

	2. Disciplines for choice	
1	Computer science	61
2	Marine Information network	61
	Total	**61**

	TOTAL IN THE BLOCK:	**1717**
A set of general professional disciplines		
1	Descriptive geometry. Engineering graphics	120
2	Mechanics	172
3	Material Science. Technology of constructive materials	116
4	General Electrical Engineering & Electronics	130
5	Metrology, standardization and certification	100
6	Life safety	132
7	Ship's construction	130
8	Radio engineering	60
9	Service organization on vessels	50
	Total:	**1010**

	1. Disciplines for choice	
1	Ship power plant and electrical equipment	110
2	Nuclear power plant	110
		0
	Total	**110**

	TOTAL IN THE BLOCK:	**1120**
A set of special disciplines		
1	Navigation and pilotage	370
2	Maritime astronomy	162
3	Safety navigation	390
4	Radionavigation devices and radiocommunication	90
5	Technical facilities of navigation	300
6	Automatization navigation	104
7	Theory and ship's construction	130

8	Ship's steering	360
	Total:	**1906**

	TOTAL IN THE BLOCK:	**1906**
Disciplines of specialization		
1	Technology and cargo transportation by sea	270
2	Hydrological service of navigation	150
3	Marine radio and telecommunication	150
4	Fundamentals of specialty	47
5	Business English language	120
6	Safe tanker operation	100
	Total:	**837**

	TOTAL IN THE BLOCK:	**837**
Optional disciplines		
1	English of specialty	450
	Total:	**450**

	IN ALL:	**7830**

A TRAINING SHIP

The sail training ship "Mir" was built in Poland in 1987 and belongs to Admiral Makarov State Maritime Academy (St. Petersburg, Russia). The "Mir" is a three-masted sailing vessel, by rigging she is a sailing ship.
The STS “Mir” is a waterborne school for hundreds of cadets of Admiral Makarov State Maritime Academy, maritime educational establishments of Russia and other countries.
Since 1987 “Mir” takes on board cadets’ groups from Bulgaria, UK, Poland, Syria, USA, Sweden, Turkey giving them the possibility of not only professional practice experience but the check of character, sea skills, the first experience of the work in multinational crew, international friendship and mutual aid.
Since 1988 the STS "Mir" has been invariably taking part in International Tall Ships' races, arranged by Sail Training International (STI).
The STS "Mir" has unofficial title of "the fastest sailing ship of the Planet".
In 1998 the Governor of St. - Petersburg handed over the coat of arms and the flag of St. - Petersburg to the "Mir" thus awarding the official status of "St. - Petersburg's Envoy" to the ship.
www.tall-shipmir.com

The main characteristics of the ship:

overall length (with bowsprit)	110 m
beam	14 m
maximum draught	6.7 m
displacement	2256 tons
total power of engines	1100 hp
height of masts:	
foremast and mainmast	49.5 m
mizzenmast	46.5 m
sails area	2771 sq.m
crew (including cadets)	199 men
cadets	up to 144

OBT SCHEME

First year cadets of the sailing specialties have initial 8 week sea-going training on the island Zapadny Berezovy which is located in the gulf of Finland. Upon completion, the cadets get non-conventional SOLAS certificate, issued by the faculties and approved by Maritime Administration, and valid for passing shipboard training onboard STS “Mir”.
Deck and engine cadets of the 2nd year of study undergo shipboard training on STS “Mir”.
Senior cadets undergo sea service on the vessels of Russian and foreign shipping companies.
Thus, deck cadets should have, in total, 12 month of sea service, engine cadets - 8 months, electric and radio cadets – 10 months.

6. Academic Personal Database

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>Kozlova</td><td>Elena</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="4">TEL. +78123226083
FAX +78123227781
MOBILE +79219183206
EMAIL e.kozlova@gma.ru
ADDRESS: Admiral Makarov State Maritime Academy, 15-A Kosaya Liniya, V.O., Saint-Petersburg 199106, Russia</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Russian
2. English</td><td colspan="3">1. Academic maritime education
2. International projects in maritime education</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Marine and port management
2. International relations and communication
3. Intercultural awareness in maritime field</td><td colspan="2">-</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">-</td></tr>
</table>

5.2.5. Admiral Ushakov Maritime StateAcademy (Russia)

National System of Maritime Education and Training in Russia (MET)

The Scheme of maritime education and training

The system of maritime education and training in Russia is a part of entire national educational system. The rules and regulations of study in maritime institutions (MET), including scientific degrees, awarding academic certificates, diplomas and etc. are the same as those in national universities and technical colleges supervised by the Ministry of Education. The graduates of MET institutions can continue their education in the institutions and universities other than MET system. The Ministry of Transport together with Ministry of Education provide for necessary theoretical and practical knowledge in the curriculum for developing professional competence in accordance with STCW Conventions and Industry requirements.

Met in Russia is effected on three educational – qualification levels:
1. Secondary maritime training - provided by marine colleges and schools;
2. Professional university education – provided by maritime academies;
3. Higher scientific education – provided by maritime academies.

All MET institutions in Russia are state. There are no private MET institutions.

As to marine training, MET on the first level prepares students of auxiliary level (sailors) for work on board. However these sailors after marine service can enter maritime academy at the department of external education, which gives six year training. The curriculum includes 6-8 week studies, practical training twice a year and 6 months studies during the fourth academic year for obtaining the Certificate of Competence on the operational level and getting the Diploma.

Another scheme on level 1 provides for MET during three and a half years, it involves on board training. The graduates can serve on ships holding a position of senior auxiliary level. The students enter academy for a special short course of studies either just on graduating the first level education or

after the service on sea. After graduating the said course in MET a student is ready for performing the management level functions and getting a diploma, equivalent to diploma of full-time students.

Level 2 at the academies provides 5.5 years studies with academic diploma equivalent to the Master of Science and specialties: Navigator and Marine Engineer depending on the type of training. This level provides for 12 months on board training and obligatory short courses permitting to obtain Certificate of Competence on operational level and approval of the State Attestation Commission. As a result students finish higher MET education and obtain the right to perform managerial functions.

MET on level 3 is designated for higher scientific education and obtaining Diploma and Degree of Doctor.

There are 22 institutions providing MET on different levels for different purposes. Ten of these institutions, including three maritime academies, marine college and 6 marine schools, are under the supervision of "Department of marine education and training for sea-going fleet" (MPMSFD) and provide MET for sea-going fleet. The remaining twelve institutions MET provide training primarily for river fleet and are under the supervision of "Department of marine education and training for river fleet" (MPMRFD).
The Ministry of Education and Ministry of Transport defined seven specialties for navigators and engineers. These specialties are awarded code numbers which can be taken from Harbour Master to evaluate seafarers for obtaining Certificate of Competence.

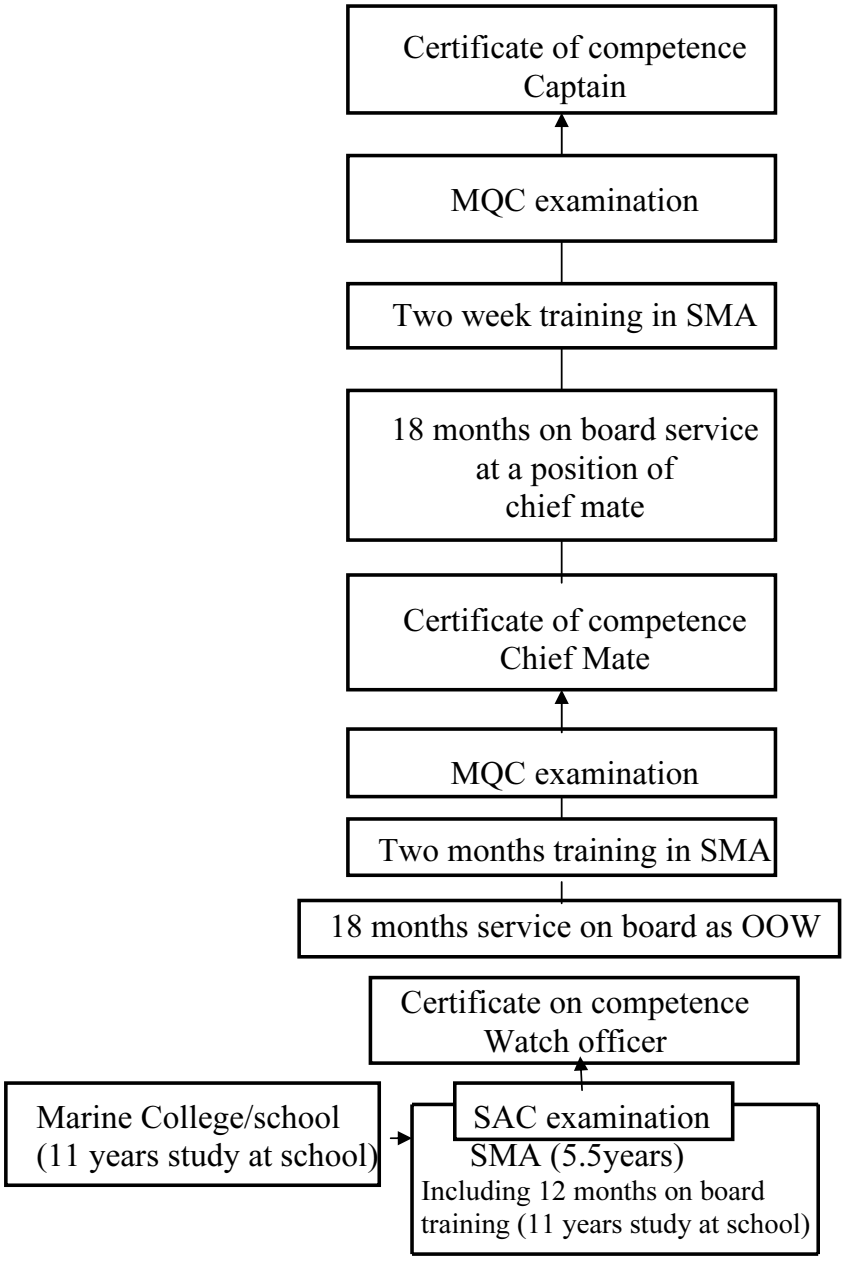
All Marine schools and colleges depending on territory location are supervised by three academies with the purpose of study standards control. Accredited institutions providing MET for regular Certificates of Competence on operational level are the following:
Admiral Makarov Maritime State Academy in Saint-Petersburg (AMSMA);
Admiral Ushakov Maritime State Academy in Novorossiysk (AUMSA);
Far East State Maritime Academy (FESMA) in Vladivostok.

Figures 1 and 2 show career growth of deck and engine officers since their entering MET up to the higher level of obtaining Certificate of Competence. Figures 3 and 4 show the level development of MET, increase of practical experience on board and certificates according to STCW for deck and engine officers, accordingly.

These three academies provide MET up to managerial level and observe curriculum in accordance with STCW – 95. The hours for lectures, practical studies, work in the laboratories, shops and simulators being the main subjects for professional growth from operational level to the managerial level.

Fig. 1

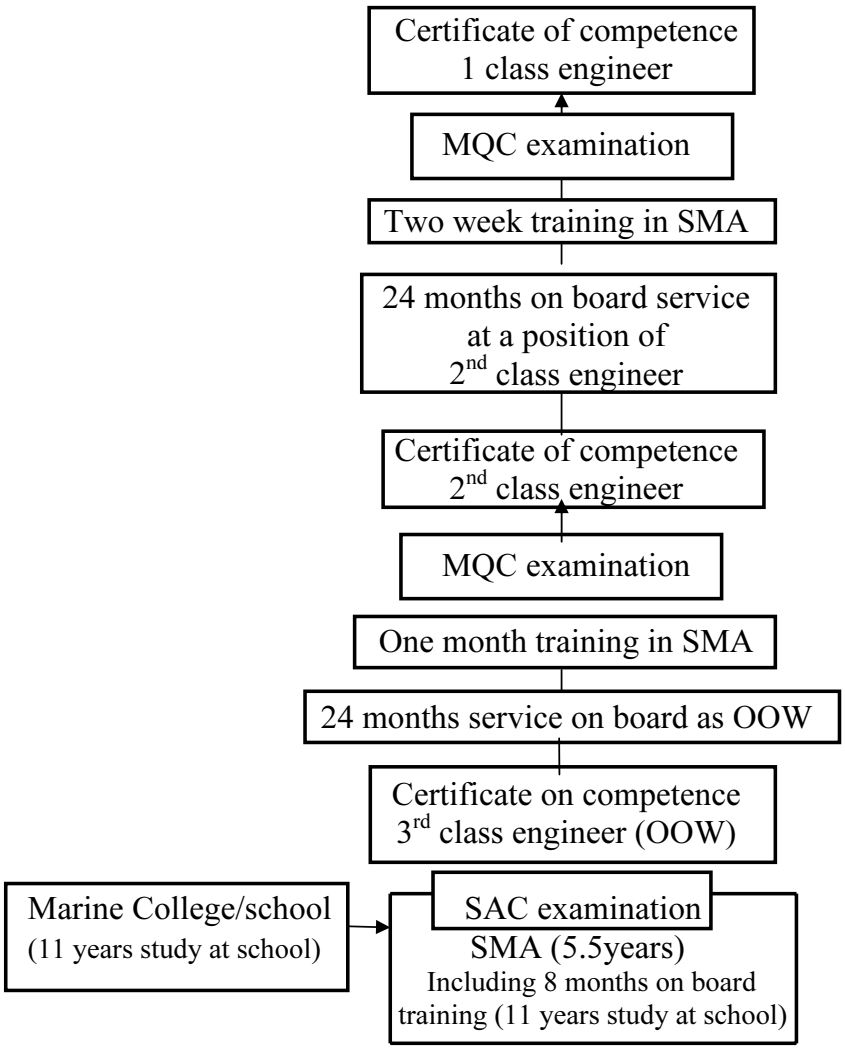
RUSSIA
CHART OF MOVEMENT FOR REGULAR
CERTIFICATES OF COMPETENCE
DECK CREW



SMA – state maritime academy
OOW – watch officer
Sac – State attestation commission
MQC – marine qualification commission

Fig. 2

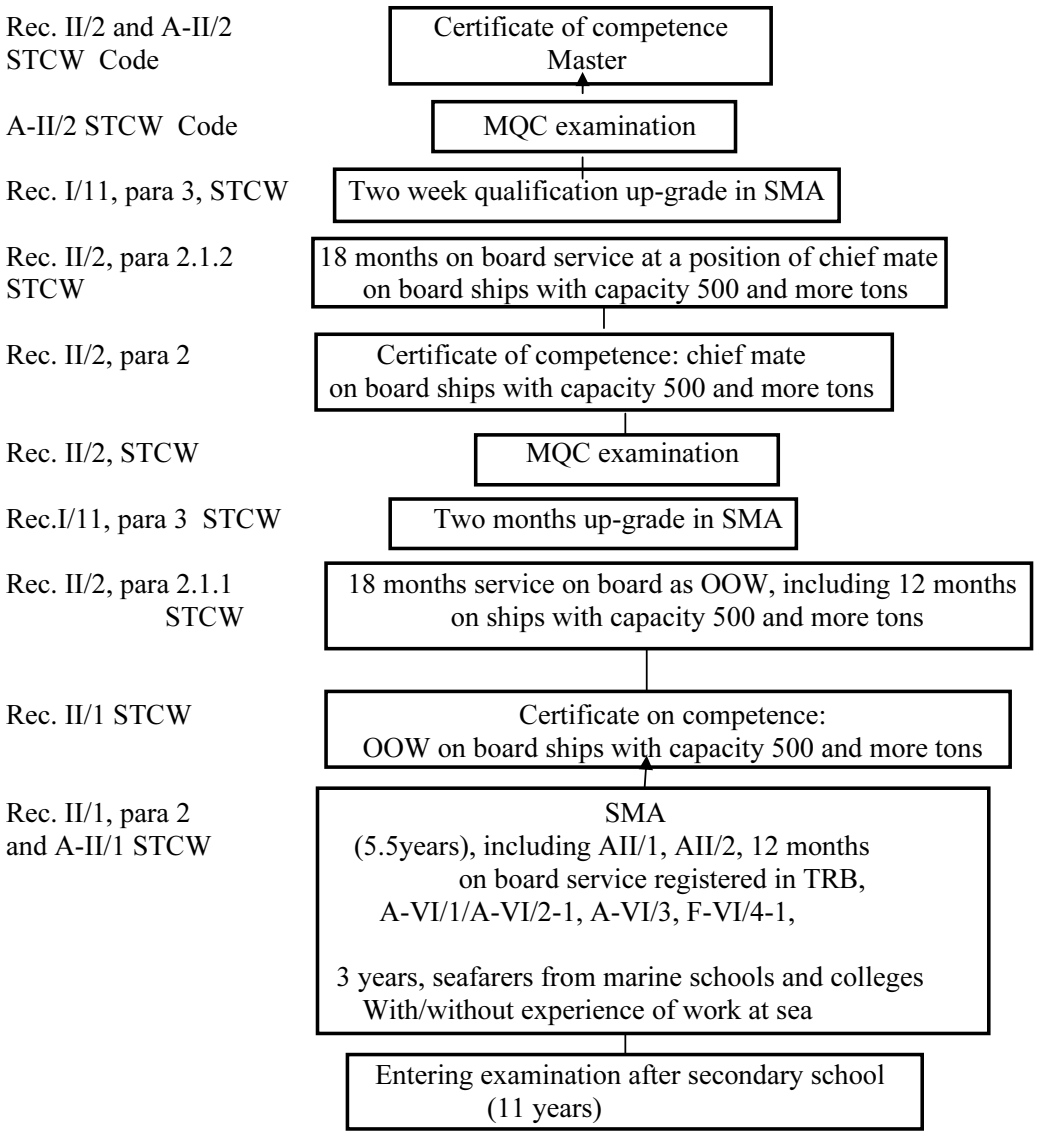
RUSSIA
CHART OF MOVEMENT FOR REGULAR CERTIFICATES OF COMPETENCE
ENGINE CREW



SMA – state maritime academy
OOW – watch officer
Sac – State attestation commission
MQC – marine qualification commission

Fig. 3

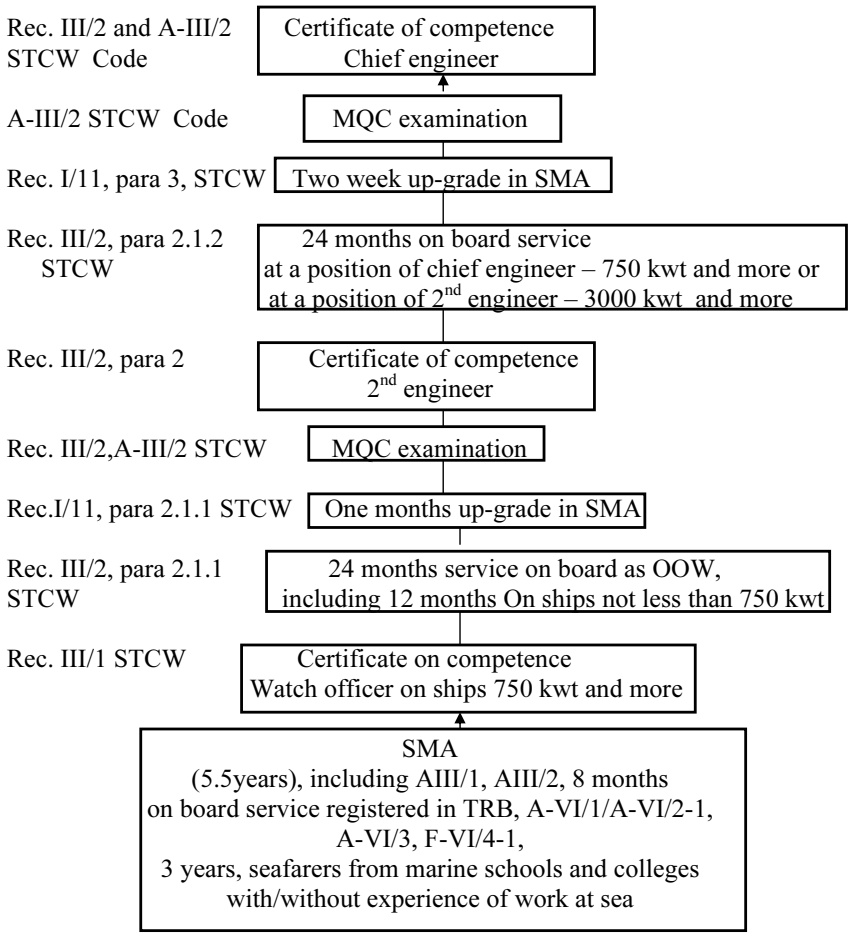
CHART OF MOVEMENT FOR REGULAR CERTIFICATES OF COMPETENCE
In accordance with STCW 95 recommendations – deck crew



SMA – state maritime academy
OOW – watch officer
MQC – marine qualification commission
TRB – study register
ROC – temporary certificate of operator
SAC – State attestation commission

Fig. 4

CHART OF MOVEMENT FOR REGULAR CERTIFICATES OF COMPETENCE
In accordance with STCW 95 recommendations – engine crew



SMA – state maritime academy
OOW – watch officer
MQC – marine qualification commission
TRB – study register
ROC – temporary certificate of operator
SAC – State attestation commission

Mandatory short courses and the courses for special training in accordance with special type ships requirements.

In accordance with rec. VI STCW-95 training at basic safety courses became obligatory while employing seafarers for ships of any capacity, e.g even for taking sailing practice. Taking safety courses is also obligatory for the officers wishing to obtain certificate on the operational level in navigation and engineering disciplines. Obligatory is also the training ARPA, GMDSS and SOLAS for obtaining certificates of Watch officer. The training of seafarers for special operations on board special type ships such as tankers, passenger ships and etc. became also obligatory. The academies have their own centers of training providing studies at obligatory short courses and carrying out preparation for specialized vessels. The centers also provide courses for qualification up-grade.

While the centres are part of the academy they act as separate units . Seafarers pay for training in the centres. Equipment and study materials, belonging to the centres and academy are used both for full-time education and for courses with external form of study.

Training centres were also established by some shipping companies, e.g. the shipping company "Novoship" has arranged its own center for training seafarers. This center is used primarily for training ship's crews of the company, but the equipment is also used for training outside persons provided they pay. The standard of curriculum, equipment and recourses are controlled by the Harbour Master. Accordingly, such center is established in Vladivostok at the shipping company. The centres and academies have an agreement of mutual using some equipment.

Resources and facilities.

The academies provide the higher education on the level of "Master of Science" degree and have possibility for preparing degree of 'Doctor of Science". Qualification of the teaching staff is defined by the rules adopted by the institutions of university level. Qualification of the teaching staff meets the requirements of the fact that the lecturers and even professors at the top of MET institutions, who teach subjects according to STCW -95 competence, should have at least the degree of Master or equivalent one and also an experience of sea service. The academies supply their teachers, from time to time, with possibility of on board service for mastering and obtaining practical experience to get certificates of higher level. This arrangement provides teachers with financial motivation. The teaching staff is controlled by special department of the Ministry of Education. In respect of up-grading the teachers publish works and scientific papers. The academies encourage career growth of the teaching staff and welcome obtaining diplomas of "Doctor", which they can get in their own academies. The academies also arrange special programs on teaching technology and pedagogy for young teachers.

The quality and quantity of teachers is satisfactory in all three academies. The ratio of young professionals and old experienced teachers is good. Young teachers prefer to use new technologies such as simulators, computers. Although the number of students who have chosen marine specialties MET remains the same the quantity of teachers varies. Table 1 shows the ration of students and lecturers (with sea service experience) with regard to full course of study.

Table 1

Institution	Average annual registration	Lecturers with sea practice	Ratio of students and lecturers
Academy in Saint-Petersburg	170	123	7
Academy in Novorossiysk	180	80	11
Academy in Vladivostok	200	76	13

The above academies pay special attention to practical training in compliance with theoretical program. Laboratories and shops are well equipped with study manuals and are adopted for practical experiments and exercises. The academies have sufficient number of simulators for mandatory course GMDSS. The academies also have simulators for handling ship, cargo operations and engine; PC software is available for obtaining practical skills and self study. All academies have good premises for lessons and practical studies. In all three academies military training is a part of curriculum.

Admiral Ushakov Maritime State Academy (Novorossiysk)

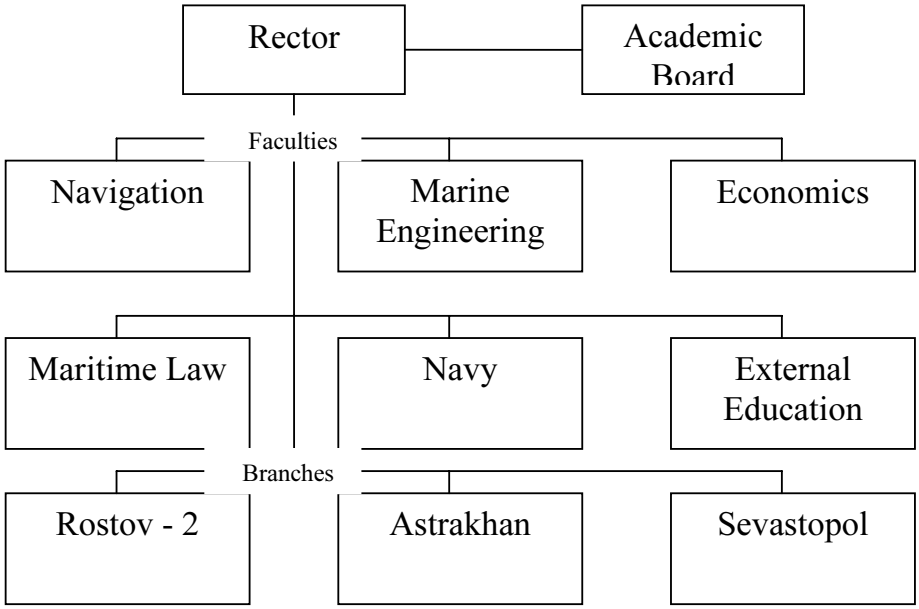
Novorossiysk Maritime Academy is a rather young institution MET. It was reorganized into the State Maritime Academy in 1992 from its predecessor the Higher Engineering College. The academy has 6 faculties, 4 units and one training centre. Marine colleges in Rostov-on-Don (2), Astrakhan and

Sevastopol are under the auspices of the academy and students of these colleges have opportunity to enter academy for continuing their education.

General information of the Academy

Name: Admiral Ushakov Maritime State Academy (AUMSA)
Rector: Prof. Dr. Sergey I. Kondratyev
Address: 93 Lenin avenue, Novorossiysk, Krasnodar region, 353918 Russia
Phone/fax: +7 8617 717525
URL: www.nsma.ru

Structure of the Academy



Teaching staff of the Academy – total 402 persons, including: with scientific degree "Doctor of Science" and (or) scientific title of professor – 31; with scientific degree of "Candidate of science" and (or) scientific title of docent – 213 persons.

OBT

The Academy has no training ships. The cadets have on board sailing training in domestic and foreign shipping companies.

On board training in AUMSA is considered as a part of educational curriculum. Cadets of maritime Faculties and Departments are required to undergo at least 8 months (Marine Engineering, Marine Electro-engineering) and 12 months (Navigation and Water transport operations) sea service during two on board training periods. On board training programs for cadets are composed in compliance with of STCW – 78 Convention requirements as amended in 1995 (Chapter A - II/1 - Master and Deck Department; A – III/1 - Engine Department, A-IV/2 – Radio Communication and Radio Personnel). On board training program is a part of the general training program. The on board record Book of each cadet should provide detailed documentary evidence of the tasks and duties set in the program and of the progress achieved. The cadets undergo on board training on the ship of various types of about 20 different shipowners and ship operators, flying Russian and foreign flags of registry with mixed and Russian crew on board.

5.2.6 Batumi State Maritime Academy(Georgia)

1. National system of the education and MET in the Georgia.

Batumi is a kind of Georgia's "sea door" due to its Sea Port, Railway junction and other unique fields of industry. Batumi is the administrative centre of Adjara Autonomous Republic. It is located on the Black Sea Coast. The city stretches on 7 km distance from the north-east to the south-west.
The first information about Batumi is found in works of Greek philosopher Aristotle and later in works of Roman writer Plinius senior and Greek geographer Phlavius Arienese in 4th century A.D. It was mentioned as city of Batusus, this is Greek word meaning "deep". The quay of Batumi port is the deepest and the most convenient after Sevastopol Sea port on the Black Sea.

1.1. Information on the national higher education system.

A higher education establishment is the important factor of growth and competitiveness of the country and plays a key role in reforms of EU member and partner states. Higher education upgrade was recognized as the basic condition for success of Lisbon strategy which the European Union began in March, 2000 and which aspiring the modernization of economic and social systems within EU. Upgrade of higher education of EU is clearly stated in communications of the European Commission "Mobilization of intellectual elite of Europe: granting of possibility of universities to make their full contribution to Lisbon Strategy" and "Upgrade of universities: Education, research and an innovation".

- **Access and admission to higher education**

- Access to first cycle (Bachelor degree) and short cycle programmes requires general education (12 years) diploma. Admission to bachelor programmes requires passing the unified national exams. Access to Diploma specialist programmes requires only general ability test.
- Access to second cycle (master) programme formaly requires bachelor degree. Admission to master programme requires passing unified masters exam. Additional admission requirements can be defined by Higher education institutions.
- Access to third cycle (doctorate) programme formaly requires master or equivalent degree. Admission requirements are defined by Universities

- **Types of Higher Education Institutions**

From 2009 in Georgia there are the following Higher Education institutions: college, teaching university and university.

College – Higher Education institution that provides short cycle (diploma specialist) programmes within firs cycle and/or first cycle degree programmes.

Teaching University- Higher Education institution that can offer first and second cycle programmes. It is obliged to provide second cycle – Master's programme.

University - Higher Education institution that provides all three cycle programmes and carries out research.
Higher Education Institution can be either public or private legal entity

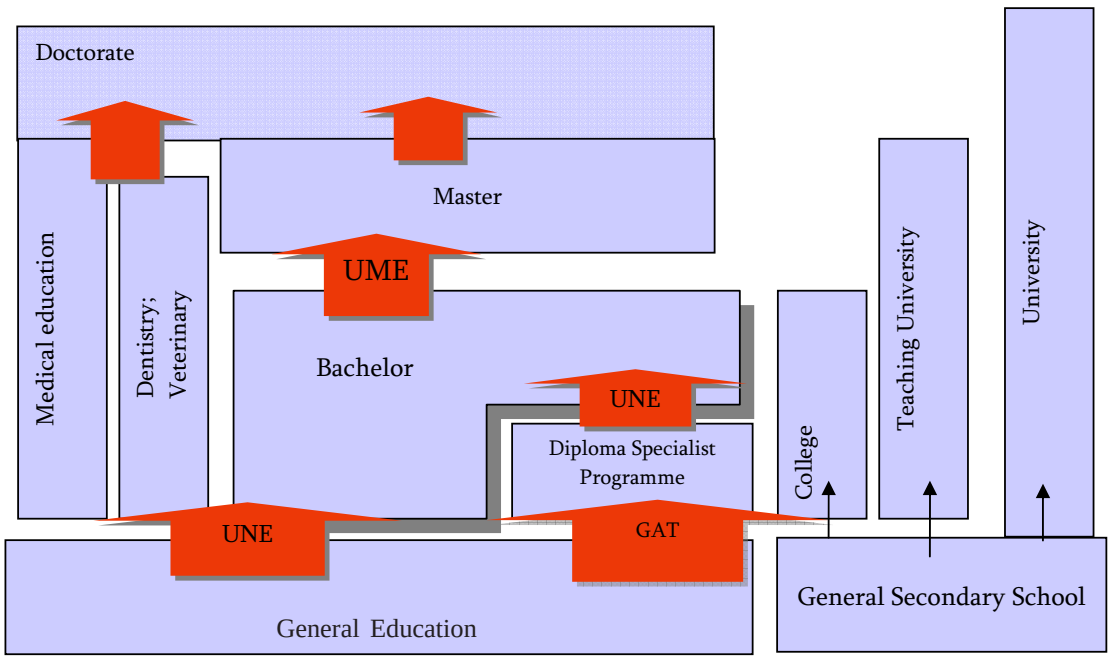
- **Qualifications**

Three cycle higher education system was introduced in 2005. Since 2009-2010 academic year all HE institutions provide only three cycle system programmes (except medicine, dentistry and veterinary). There are following cycles: bachelor, master and doctorate. All cycles are linked to European credit transfer system (ECTS).

- **First cycle Degree:** Bachelor (BA, BSc, BBA; BEng; BFA; B.Mus etc.) – 240 ECTS
  In 2007 short cycle (diploma specialist) within first cycle was introdused. Short cycle (Diploma specialist) programmes consist of 120-180 ECTS credits and are designed to prepare students for labour market entry. In order to continue and complete first cycle programme diploma specialist should pass unified national exams. ECTS credits earned for short cycle may be recognized by HE institution for bachelor programme.
- **Second cycle degree:** Master (MA; MSc; MBA; MEng; MFA; M.Mus etc) – 120 ECTS.
- **Third cycle degree: Doctorate (PhD) -** 180 ECTS.

- **Degrees in medicine** (MD – 360 ECTS), dentistry (DMD- 300 ECTS) and veterinary (DVM-300 ECTS) comprise an integrated programme of study and final outcomes of the qualifications meet the requirements of the second cycle learning outcomes.
- **Quality assurance:** Quality of education is assured by internal and external quality assurance mechanisms. External quality assurance is implemented by national education accreditation centre.
- **Grading:** The grading system used in all higher education institutions as from 2007 is the 100-point grading scale.

The Structure of the Georgian Higher Education System



a. **MET system in the Georgia.**

Maritime education has a century history in Georgia. The first maritime courses were founded in Poti in 1901. The Military Maritime College was functioning in Batumi since 1921, and Maritime Industrial Technical Secondary School was functioning since 1929.

In 1944 Batumi Maritime Technical Secondary School was reorganized into Batumi Maritime College. During its 50-years history Batumi Maritime College played an important role in development of Maritime Business in Georgia. About 5 thousand highly qualified specialists were educated at Batumi Maritime College.

In 1990 on basis of Batumi Maritime College the Training-Consultation Centre was opened. It received the status of Consultation Point of Novorossiysk Higher Maritime College which since 1992 was functioning as Batumi Higher Maritime College.

In 1994 on basis of decision taken by the Government of Georgia this college received current status – status of Batumi State Maritime Academy.

In 2006 when the process of education reforms started in Georgia, on basis of decision taken by government of Georgia Batumi State Maritime Academy received today's status– Legal Entity of Public Law – Teaching University Batumi State Maritime Academy (BSMA).

There are three MET institutions (all institution located in Batumi) in Georgia:

1. Legal Entity of Public Law – Teaching University Batumi State Maritime Academy.
2. Maritime Training Centre – ANRI Maritime College (LTD).
3. Batumi Navigation Teaching University (LTD).

BSMA and other MET institutions activities are regulated by National Legislature as well as by International Norms and Standards. Requirements of International Maritime Organization regarding qualification of maritime staff are given in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 78/95). Maritime education in Georgia is regulated by three laws (see fig.1):

1. Law of Seafarer's Training and Certification of Georgia (2000);
2. Law of Higher Education of Georgia (2005);
3. Law of Vocational Education of Georgia (2007).

The control of IMO requirements realization in the sphere of Maritime Education in Georgia is under the control of the Maritime Transport Department and National Legislative issues are in the competence of Georgian Education and Science Ministry.

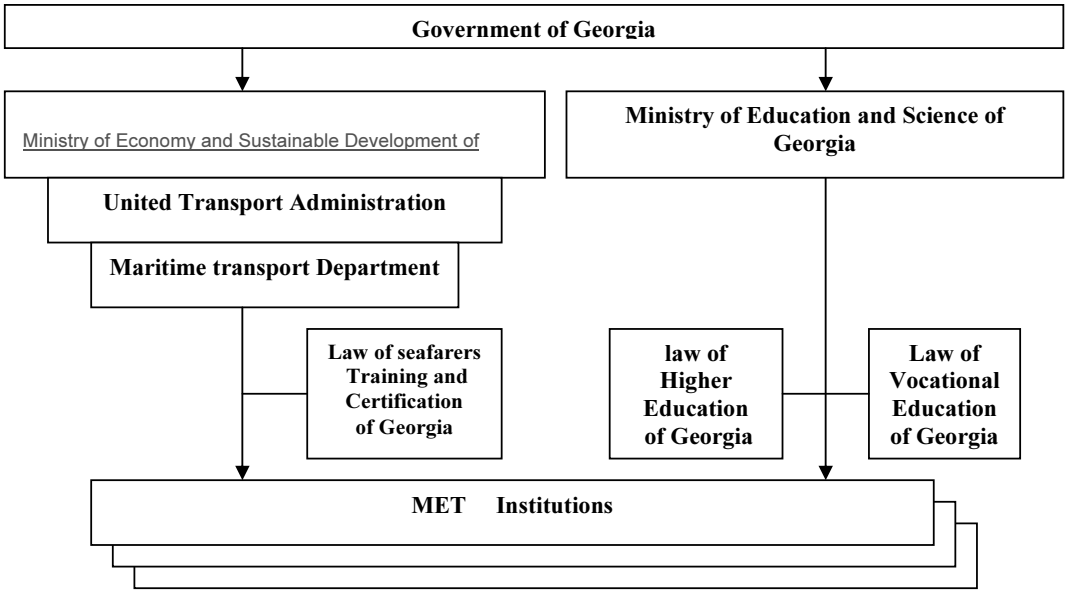


Fig.1. Regulation MET in Georgia

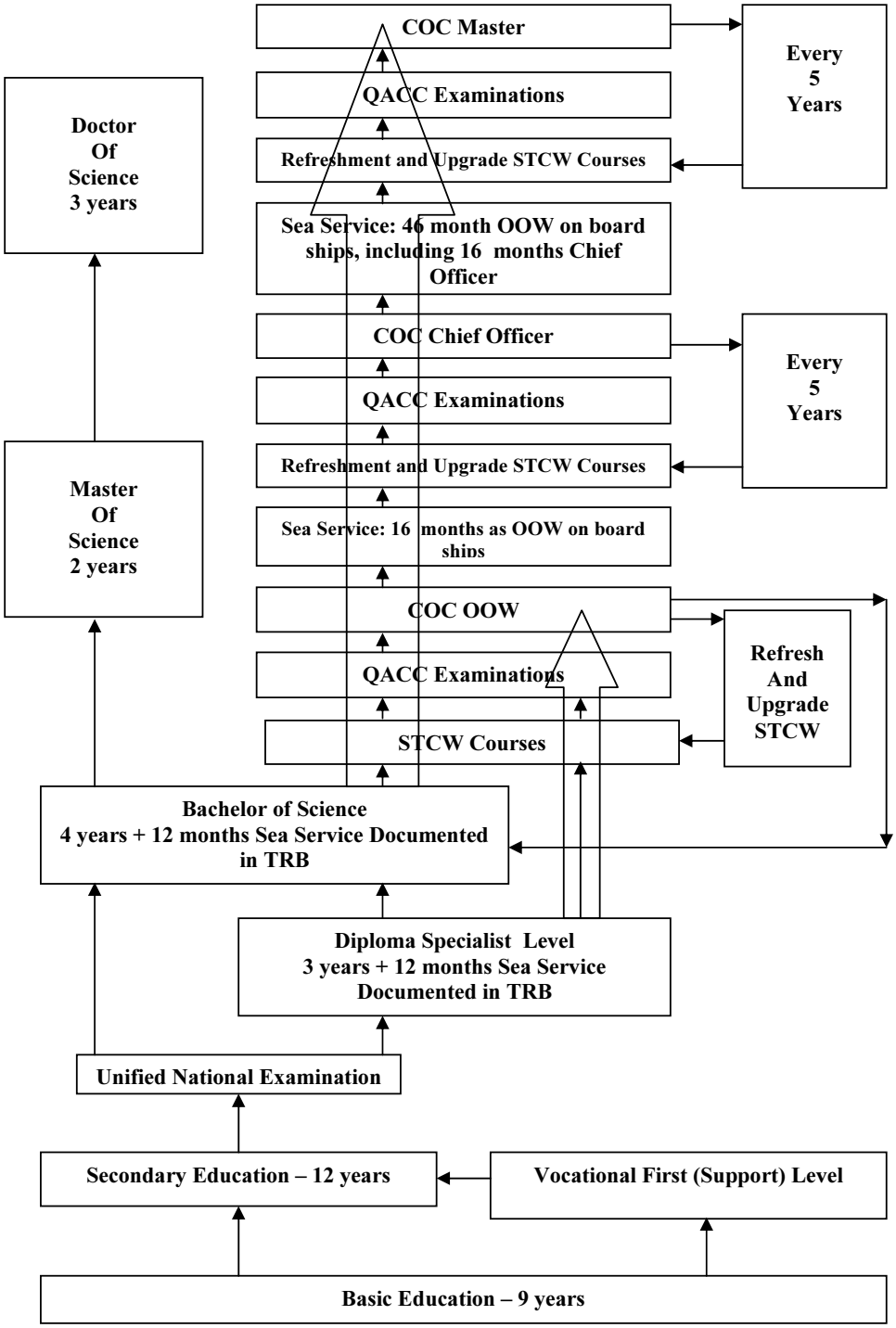


Fig. 2. The Certificates of Competency (Deck) according to the STCW and Law of Seafarer's Training and Certification of Georgia (2000).
QACC - Qualification Assessment Commission of Competency.
COC - Certificates of Competency.
OOW – Officer in charge of the watch.
TRB – Training Record Book.

11. General information of the BSMA.

Name of the Institution: Legal Entity of Public Law – Teaching University BSMA.
Rector: Nikoloz Tsiklauri.
Address: 53 Rustaveli Ave., Batumi 6010, Georgia.
Phone/fax numbers: +995 222 74850
URL: http://www.bsma.edu.ge
E-mail: info@bsma.edu.ge

BSMA is the basic educational institution of Georgia. Since 2000 the world-recognized International Quality Management System ISO 9001:2000 is incorporated at the Academy according to the requirements of International Convention STCW 78/95. The system ensures conformity in respect of development of educational programs, methods of instruction and Maritime higher Education specialists training in accordance with International and National requirements of Maritime Law. Batumi Maritime Academy is one of the first institutions in post-soviet area in which this system has been incorporated.
In 2006 BSMA joined the International Association of Maritime Universities (IAMU). In 2010 BSMA to take part Inaugural meeting Black Sea Association of Maritime Institutions (BSAMI), organized by Istanbul Technical University Maritime Faculty
At present two faculties function at Batumi Maritime Academy: Maritime and Business and Management Faculty. Training and Certification Centre also functions at the Academy.
Maritime Faculty - functions at the Academy since 1992. It comprises three specialties: Marine Navigation, Marine Engineering and Electrical Engineering. During this time the faculty has prepared more 2000 highly-qualified maritime specialists. The high percentage of employment of graduate students of BMA (88% of Navigational, 70% of Marine Engineering and almost all Electrical Engineering graduates) indicates high level of Maritime education in Georgia.
Educational programs are compiled according to International Maritime Organization recommended Model courses and in compliance with STCW 78/95 requirements. Educational program meet the requirements Law of Seafarer's Training and Certification of Georgia (2000), Law of Higher Education of Georgia (2005), and Law of Vocational Education of Georgia (2007).
When the Law on Vocational Education was ratified, BMA developed and presented two higher Diploma Specialist educational programs ("Marine Navigation" and "Marine Engineering" everyone on 180 ECTS credits) and two programs of the first (support) level ("Able Seamen» and "Motormen" everyone for 10 months of training) for the State Accreditation.
Programs of the first (support) level are trained in the Training and Certification Centre.
Now days Maritime Faculty has Bachelor (Marine Navigation, Marine Engineering and Electrical Engineering) and Diploma Specialist (Marine Navigation and Marine Engineering) educational programs.
The curriculum of Bachelor Program consists of 240 ECTS credits, 1 ECTS credit is equal to 29 astronomic hours. One academic year consists of 42 weeks. The duration of studies is 4 years and 12 month cadets have shipboard training on vessels of the leading shipping companies.
The curriculum of Diploma Specialist Program consists of 180 ECTS credits. The duration of studies is 3 years and 12 month cadets have shipboard training on vessels of the leading shipping companies.
At present 784 cadets study by the Bachelor Program and 147 cadets by the Diploma Specialist Program.
The process of studies at the faculty includes classical studies at auditory and also the modern methods of training using the latest simulator and information computer technologies. This is applied as to general as well to special courses. During the whole period of studies the cadets are taught the English language.
On the basis of the training process and bachelor's project results the cadets are given the correspondent bachelor's academic degree in Navigation, Marine Engineering and Electrical Engineering.
After this the cadets pass qualification examination in specialty at the Academy. On the basis of this examination Maritime Transport Department of Georgia issues first Certificate of Competency for

Officer in charge of a navigational watch, Officer in charge of an engineering watch, and electrician of second class according to Georgian Law on Seafarers Training and Certification, 2000.
The Academy ensures the training and certification of its graduate cadets in all mandatory courses which are necessary for work on vessels according to the requirements of International Convention (STCW 78/95).
The graduates of Bachelor Program can occupy the position officer in charge ***(Operational Level)*** including the chief mate position (second engineer) and master (chief engineer) ***(Management Level)*** in conformity with the requirements of Georgian Law on Seafarers Training and Certification, 2000. The graduates of Diploma Specialist Program can occupy only the officer in charge position ***(Operational Level)*** (see fig. 2).
Six departments are cooperated within the faculty. They are: Navigation, Marine Engineering, Electrical Engineering, Foreign Languages, Exact and Natural Sciences, General Technical Subjects Departments. The Academic staff of the faculty is composed of 11 professors, 18 associate professors, 2 assistant professors and 60 assistant lecturers. Among the above-mentioned staff there are 10 Masters Mariners, 6 Chief Engineers, 4 Electrical Engineers, some of them are acting mariners the others have a rich experience of work on board the vessels.
Training and Certification Simulator Centre - since 2006 the Training and Certification Simulator Centre functions at the Academy. The aim of this centre is training, retraining and certification of students and marine fleet specialists using modern simulator technical means. The process of training at the Centre is carried out according to model courses prepared by International Maritime Organization, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 78/95) and the requirements of the National Transport Department.
At the Centre the training courses are divided into three categories:

1. Training and Certification in accordance with the "**Mandatory**" programs, by the new wording of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 78/95):

- Personal survival techniques.
- Elementary first aid.
- Fire prevention and basic fire fighting.
- Personal safety and social responsibilities.
- Proficiency in survival craft and rescue boats.
- Proficiency in fast rescue boats.
- Advanced fire fighting.
- HAZMAT.
- Oil tanker familiarization.
- Oil tanker advanced.
- Chemical tanker specialized training.
- Gas-carrier specialized training.
- Crude oil washing.
- Inert gas system.
- Shore based fire fighting.
- Ro-Ro Passenger Ships and Passenger Ships other then RO-RO.
- RADAR – radar observation and plotting.
- Radar simulator.
- ARPA – automatic radar plotting aid.
- Global Maritime Distress and Safety System (GMDSS) - General Operator.
- Global Maritime Distress and Safety System (GMDSS) - Restricted Operator.
- Ship security familiarization.
- Ship security officer.
- Electronic chart display and Information System – ECDIS.

2. Training and certification of seafarers and shipping companies staff according to "**Non Mandatory**" programs connected to fleet management, ships safe operation and prevention of environmental pollution.

    - ISM Code- International Safety Management Code.
    - Cargo and ballast operations.
    - Cargo handling and stowage including loading control systems.
    - Bridge team and resources management (using navigation simulator).
    - Ship handling (using navigation simulator).
    - Engine room team and resources management (using engine room simulator).
    - Electrical, Electronic systems management (using engine room simulator).
    - Environmental awareness and Pollution Prevention Management.

4. **Specialized courses** - work with special equipment on certain types of ships or other courses required by ship owner, shipping or crewing companies or other organizations.

- Qualification course in electric welding and gas-welding.
- Qualification course in locksmith and turner's specialties.
- Training and Attestation of seamen, motormen and boatswains.
- Refreshing and Upgrading courses for Master's, Chief Engineers and all deck and engine officers.
- Personal Computer course.
- Maritime English course.

Leading professors and instructors of Batumi Maritime Academy work at the Training and Certification Simulator Centre. Some of them are Masters, Chief Engineers and Electricians, some of them are active mariners, and some have big experience of work at sea. All instructors of the Training Centre have certificates of special instructors issued by training centers of simulator manufacturing companies. The certificates are recognized by Maritime Transport Department of Georgia.

For the purpose of training and certification the following simulator systems of world-famous simulator systems producing corporation "TRANSAS Set the Standard" are used at the Academy.

Integrated navigational simulator – Navi-Trainer Professional 4000 including - instructor's workplaces, main navigational bridge with real equipment and visualization and additional navigational bridge.

GMDSS simulator TGS 4100 including – 1 instructor's and 6 trainee's workplaces, one real GMDSS system workplace.

Engine Room Simulator ERS 4000 including – 1 instructor's and 4 trainee s workplaces, computer-based electrical plant and all equipment and systems of real-size engine room of tanker type ship.

Business and Management Faculty - functions at the Academy since 1996. It comprises the following specialties: multimodal sea shipping organization and logistics, financial and marketing managements of the ports. During time of its existence the faculty has prepared over than 400 highly-qualified specialists. At present 354 students master profession of sea shipping organization and logistics and 74 students master profession of financial and marketing management at the faculty.

Studies at the faculty consist of two stages: 4 years - to receive bachelor's degree and 2 years - to receive master's degree.

The curricula are composed according to the international transport requirements and are oriented on financial, port and transport infrastructure. Students receive practical training in Trading Ports of Batumi and Poti, in correspondent departments of different shipping, transport and financial companies.

The graduates of the faculty work in shipping, port, financial, stevedore, broker's, surveyor's, agent's, dispatcher's and other companies.

Three training departments cooperate with the faculty. They are: Multimodal Sea Shipping Organization and Logistics, Financial and Marketing Management of Ports, Humanitarian Disciplines.

The Academic staff of the faculty composed of 6 professors, 8 associate professors, 3 assistant professors and 25 assistant lecturers. Many of them are specialists from port, shipping, transport and financial companies.

Quality Provision Service was created at Batumi Maritime Academy for the purpose of improvement of scientific-research work and academic staff qualifications, for systematic check-up of quality.

Quality Provision Service - in addition to it the function of Quality Provision Service is to establish contact with quality provision services of higher education institutions in Georgia and foreign countries in order to establish clear criteria and methodology which ensure these criteria, modern methods of studies, teaching and assessment.

Since 2000 the world recognized International Quality Management System ISO 9001:2000 is incorporated in the Academy according to the requirements of International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW 78/95). The system ensures conformity in respect of development of educational programs, methods of instruction and Maritime higher Education specialists training in accordance with International and National requirements of Maritime Law.

Library - the library of Batumi Maritime Academy is the only specialized library of maritime technical literature in Georgia. Book resources comprise 40 000 books. The electronic systems are incorporated in the library, i.e. Internet catalogue what enables the reader to find necessary literature from home.

The Academy has book storage space where it is possible to place 150 000 books ensuring all conditions and also new reading hall with 100 workplace and Internet library, electronic information resources in form of 70 000 electronic books and articles.

Professors' and Lecturer's Qualification Centre - functions alongside with the other departments at the Academy. General aim of the Centre is to provide the Academy with highly-qualified staff for training and scientific-research processes.

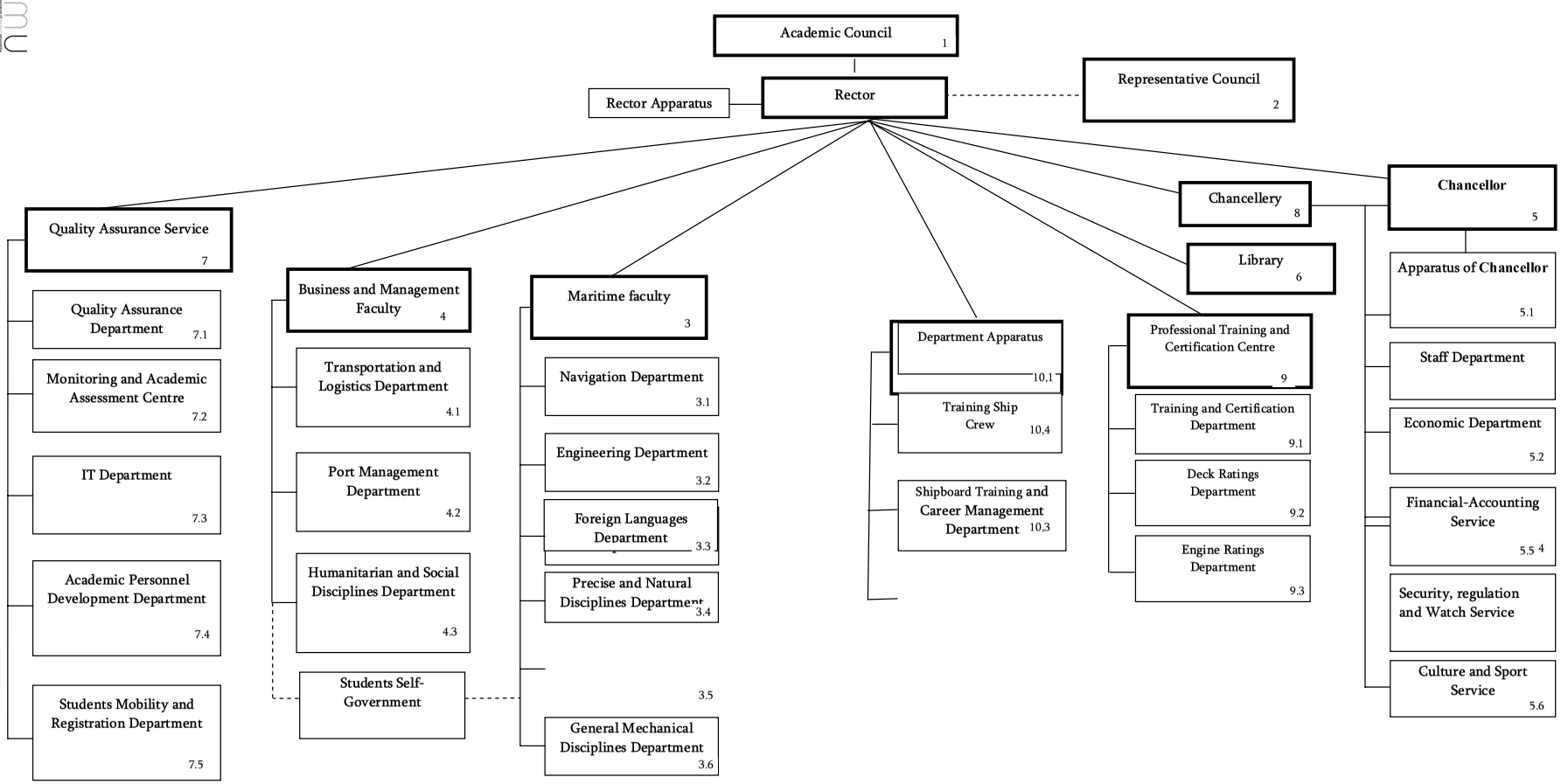
Since the Academy has joined Bologna process trainings are intensively held at the Academy where European credit system; curricula and syllabuses in all subjects for receiving the qualification on bachelor's level are discussed.

The specialists from other countries are invited to the Academy. During the last two years specialists from Canada, the Ukraine, Greece, Turkey have visited and shared their experience with the Academy. Professors' and Lecturer's of the Academy were sent on business trips to Russia, the Ukraine, Poland, Holland, Germany Greece and Sweden.

The students' self-government system - functions at the Academy. This system ensures participation of the students in management of Batumi Maritime Academy, contributes to protection of students' rights, chooses the representatives in students' council and fulfills other duties mentioned in the Regulations.

Social infrastructure for students is well-developed at the Academy. Comfortable dormitory, a club for 500 people, mess-room, snack-bars, cafes. For going in for sports there are gym, two room with sports training facilities, football and basketball field. The students of the Academy take part in amateur art activities; Academy has folk dance ensemble, brass band and team of merry and witted people which has won many international competitions. Chess, arm-wrestling, swimming, volleyball, basketball and football sections function at the Academy. The students of the Academy take part in local, national and international sports competitions.

3. Structure of the BSMA.



4. Structure of Programs(Topics/Hours/OBT)
Marine Navigation

<table>
<tr><td rowspan="2">I year,
I course</td><td>I semester</td><td rowspan="2">Foreign Language Block:
1.Basic English;
2.Russian
10 ECTS</td><td>Mathematics
10 ECTS</td><td>Physics
10 ECTS</td><td>Engineering Graphics 5 ECTS</td><td>Informatics and Informational Technologies
5 ECTS</td><td>Humanitarian Block 5 ECTS</td></tr>
<tr><td>II semester</td><td></td><td></td><td>Chemistry
5 ECTS</td><td colspan="2">Introduction to Specialty:
1. Navigation;
2. Material Science; Technologies, Practice
10 ECTS</td></tr>
<tr><td rowspan="2">II year,
II course</td><td>III semester</td><td rowspan="2">Maritime English I level
10 ECTS</td><td>Ship's Construction</td><td>Theory of Mechanics 5 ECTS</td><td>Thermodynamics and Heat Exchange
5 ECTS</td><td rowspan="2">Technical Mechanics and Hydro Mechanics – SE
10 ECTS</td><td rowspan="2">Sea-going Practice – SE
10 ECTS</td></tr>
<tr><td>IV semester</td><td>Prevention of Pollution of sea Environment
5 ECTS</td><td>Auxiliary Machinery, Auxiliary Systems of Ships and their Operation
5 ECTS</td><td>Ship's Boiler Plants and their Operation
5 ECTS</td></tr>
<tr><td rowspan="2">III year
III course</td><td>V semester</td><td rowspan="2">Maritime English II level
10 ECTS</td><td>Ship's Refrigerating Plants, Conditioning Systems and their operation
5ECTS</td><td>Ship's Turbo machines and their Operation
5 ECTS</td><td rowspan="2">Ship's Internal Combustion Engines and their Operation
10 ECTS</td><td rowspan="2">Ship's Electric Equipment, Electronic Devices and Control Systems
10 ECTS</td><td rowspan="2">Engine Room Training 10 ECTS</td></tr>
<tr><td>VI semester</td><td>Fundamentals of Automatics and Ship's Automatic Control Systems
5 ECTS</td><td>Basic Conventional Training and Safety at Sea
5 ECTS</td></tr>
<tr><td colspan="2">IV year</td><td colspan="6">Shipboard Training</td></tr>
<tr><td rowspan="2">V year,
IV course</td><td>VII semester</td><td rowspan="2">Maritime English III level
10 ECTS</td><td>Technical Maintenance of Ships
5 ECTS</td><td>Theory of Ship's Stability
5 ECTS</td><td>Automation of Power Systems
5 ECTS</td><td>Conventions of International Maritime Organization
5 ECTS</td><td>Humanitarian Block
5 ECTS</td></tr>
<tr><td></td><td>Marine Fleet Economics and Revenue Service</td><td>Operation of Ship's Power Plants
5 ECTS</td><td>International Maritime Law
5 ECTS</td><td colspan="2">Special Simulator Training
10 ECTS</td></tr>
</table>

Marine Engineering

<table>
<tr><td rowspan="2">I year,
I course</td><td>I semester</td><td rowspan="2">Foreign Language Block:
3. Basic English;
4. Russian
10 ECTS</td><td rowspan="2">Mathematics
10 ECTS</td><td rowspan="2">Physics
10 ECTS</td><td>Engineering Graphics 5 ECTS</td><td>Informatics and Informational Technologies
5 ECTS</td><td>Humanitarian Block 5 ECTS</td></tr>
<tr><td>II semester</td><td>Chemistry
5 ECTS</td><td colspan="2">Introduction to Specialty:
3. Navigation;
4. Material Science;
5. Technologies, Practice
10 ECTS</td></tr>
<tr><td rowspan="2">II year,
II course</td><td>III semester</td><td rowspan="2">Maritime English I level
10 ECTS</td><td>Ship's Constructions 5 ECTS</td><td>Maritime Radio Communication and Telecommunications
5 ECTS</td><td rowspan="2">Navigation
10 ECTS</td><td rowspan="2">Basic Convention Training and Safety at Sea10 ECTS</td><td rowspan="2">Sea-going practice – SN
10 ECTS</td></tr>
<tr><td>IV semester</td><td>Ship's Power and Electric Systems
5 ECTS</td><td>Technical Mechanics - SN/EM
5 ECTS</td></tr>
<tr><td rowspan="2">III year
III course</td><td>V semester</td><td rowspan="2">Maritime English II level
10 ECTS</td><td>Prevention of Pollution of Sea Environment
5 ECTS</td><td rowspan="2">Ships Handling and maneuvering and International Rules of Ships' Collision Prevention at Sea
10 ECTS</td><td>Cargo Transportation Technology
5 ECTS</td><td rowspan="2">Sea-going practice – SN
10 ECTS</td><td>Theory of Ships' Stability
5 ECTS</td></tr>
<tr><td>VI semester</td><td>Radio and Electro Navigational Systems
5 ECTS</td><td>Maritime Astronomy
5 ECTS</td><td>Maritime sailing directions and Meteorology
5 ECTS</td></tr>
<tr><td colspan="2">IV year</td><td colspan="6">Shipboard Training</td></tr>
<tr><td rowspan="2">V year,
IV course</td><td>VII semester</td><td rowspan="2">Maritime English III level
10 ECTS</td><td>Marine Fleet Economics and Revenue Service
5 ECTS</td><td>International Maritime Law
5 ECTS</td><td>Conventions of International Maritime Organizations
5 ECTS</td><td>Navigation at Sea in extreme conditions
5 ECTS</td><td>Humanitarian Block
5 ECTS</td></tr>
<tr><td>VIII semester</td><td>Planning of Ships' Loading Operations
5 ECTS</td><td>Ship Handling in extreme conditions
5 ECTS</td><td colspan="3">Special Simulator Training – SN
15 ECTS</td></tr>
</table>

5. Training ship.

Main Particulars of M/V "AKADEMIA"

PRINCIPAL INFORMATION	
Name of Ship	M/V "AKADEMIA"
Name of Owner	LEPL EDUCATIONAL UNIVERSITY – BATUMI STATE MARITIME ACADEMY
Name of Builder	TURKU - ABO SHIPYARD, FINLAND
Material / Type of Ship	STEEL/GENERAL CARGO
Navigational Area	A1 + A2
Speed In Cargo	7.5 knt.
Speed In Ballast	9.0 knt.
Date of Build	18.09.1965
Flag	GEORGIA
Port of Registry	BATUMI
Official Number	C-01495
MMSI Number	213898000
Call Sign	4LKA2
IMO Number	6516568
Class Society	MARITIME LLOYD, LTD

PRINCIPAL DIMENSIONS	
Length Overall L.O.A.	73.20 M
Length B.P.	67.32 M
Breadth	10.40 M
Depth Molded	6.23 M
Free Board	1.26 M

TONNAGE	
International Gross Tonnage	1249.00 Ton
International Net Tonnage	674.00 Ton

DEADWEIGHT AND DRAFT	
Light Ship Weight	803.93 Ton
Summer Deadweight	1860.00 Ton
Summer Draft	5.00 M

CAPACITY OF TANKS AND CARGO HOLDS	
Water Ballast	371.00 Ton
Fresh Water	35.00 Ton
Diesel Oil	98.10 Ton
HOLD NO. 1	848.48 m3 – BALES. 959.73 m3 – GREAN. 17.65x9x4.33m
HOLD NO. 2	1365.98 m3 – BALES. 1560.07 m3 – GREAN. 26.57x9x4.79m
HATCH COVER NO.1	9.62 m Length x 6.90 m Breadth
HATCH COVER NO.1	16.17 m Length x 6.90 m Breadth
MAIN ENGINE	
Type	ONE DIESEL ENGINE ECK RN 36/5 NO 180, 6 CYL-883kw (1200 BHP) AT 375 R.P.M. MADE IN RUSSIA 1992. TYPE OF PROPELLER L8

AUX. MACHINERY	
Type	TWO SCANIA VABIS DIESEL ENGINES,TYPE 011R81 SINGLE ACTING 6 CYL 4 STROKE OUT-PUT 133 BHP AT 1500 R.P.M. DIRECT COUPLED TO 90 kw 400V AC ASEA GENERATORS. ONE ELECTRIC DRIVED COMPRESSOR HATTLAPA TYPE W.H. 18-1N 28.5 m3/H 30 ATM. ONE MAIN EHGINE DRIVED COMPRESSOR. CAPASITY 30 m3/H 30 ATM BY MAIN EHGINE 366 R.P.M.
WINDLASSES	
Type	FORE. THRIGE TYPE NWIA ELECTRIC MOTOR 25 BHP. MAX. LIFTING CAPASITY 7500 KG AT 8.5 M/MIN. AFT. ONE CAPSTAN ELECTRIC MOTOR 12.5 BHP CAPASITY 3000 KG AT 13 M/MIN.

LIFE SAVING APPLIANCES	
Lifeboat size & capacity	6.57m x 2,20m 22 persons x 2 set
Life Raft size & capacity	1 x 16 person /1 x 12 person
Life Saving Appliances Provided (SE)	22 persons

6. OBT Scheme

In compliance with STCW - 78/95 requirements (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995, Chapter A - II/1 - Master and Deck Department; A - III - (1 - Engine Department, A-IV/2 – Radio Communication and Radio Personnel), all cadets undergo their shipboard training during the process of education. Navigation cadets require minimum of 12 months' seagoing service, other cadets - 8 months. Besides shipboard training, cadets of engineering faculties have technological training at the Academy's workshops. Cadets receive the first training practice on the basis existed at the Academy - in tackle, locksmith, and turner's, electric and gas welding, electric installation workshops. Cadets receive the second practice shipboard training on training-cargo ship "AKADEMIA" and vessels of auxiliary fleet of Batumi, Poti and Kulevi sea Ports where they master how to fulfill duties of sailors, motormen, electricians and get practical working skills necessary for ships' rank.

After the theoretical course cadets have shipboard training, on board the long voyage ocean fleet vessels where they master specialties of junior officers: Navigational watch, Engineering watch and electrician.

7. Academic Personal Database

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>GEGENAVA</td><td>AVTANDIL</td><td>Ph.D.</td><td>Master Mariner</td><td>Professor</td></tr>
<tr><td rowspan="5">TEL. +995 222 74851
MOBILE +995 99 589255
EMAIL:
a.gegenava@bsma.edu.ge
gegenava@gmail.com
ADDRESS: BSMA
53 Rustaveli Ave., Batumi 6010, Georgia</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Georgian
2. English
3. Russian</td><td colspan="3">1. Marin Radio Communication
2. Radio Navigational System
3. Maritime Conventions</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Academic maritime education
2. E-Navigation
3. Effectiveness of Maritime Teaching</td><td colspan="2">1. Marin Radio Communication
2. Radio Navigational System
3. Maritime Conventions</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1.“ New Black Sea Terminal of Port Kulevi and it Navigating Features ”, TransNAV 2009, Gdynia 2009.

2.“ Maritime education and training system in Georgia ”, IAMU AGA 10, St. Petersburg 2009.

3. “ BSAMI – an innovation in MET and implementation towards the future “, IAMU AGA 11, Bussan 2010.</td></tr>
</table>

5.2.7 Istanbul Technical University, Maritime Faculty (Turkey)

1. NATIONAL SYSTEM OF THE EDUCATION AND MET IN TURKEY

The basic structure of the Turkish national education system is outlined in Basic Law on National Education (Law no. 1739). This system can be summarized as follows:

Pre-school education, which is optional, aims at contributing to the physical, mental and emotional development of the children, to help them acquire good habits, and to prepare them for basic education. Pre-school education institutions include independent kindergartens, nursery classes in primary schools and preparation classes.

Basic education provides children with basic knowledge and ensures their physical, mental and moral development in accordance with national objectives. It generally comprises the education of children in the 6-14 year age group. Eight years of basic education is compulsory for all Turkish citizens who have reached the age of six. This level of education is free of charge in public schools. There are also private schools under state control.

Secondary education encompasses two categories of educational institutions, namely **general high schools** and **vocational and technical high schools** (lycées) where a minimum of four years of schooling is implemented after basic education.

The aims of secondary education are to provide students with a knowledge of general culture, to acquaint them with problems of individual and societal nature and to motivate them to find solutions; to instill in them the strength and knowledge to participate in the economic, social and cultural development of the country and to prepare them, in line with their interests and talents, for institutions of higher learning.

General high schools are educational institutions that prepare students for institutions of higher learning. They implement a four-year program over and above basic education, and comprises students in the 15-18 year age group.

Vocational and technical high schools provide specialized instruction with the aim of training qualified personnel. The duration of instruction in these schools is also four years.

Higher education: The purpose of higher education is to train manpower within a system of contemporary educational and training principles to meet the needs of the country. It provides high level specialized education in various fields for students who have completed secondary education. The Higher Education Law (Law no. 2547) which went into effect in 1981 covers all higher education institutions and regulates their organization and functions. Universities comprising several units are established by the state and by law as public corporations having autonomy in teaching and research. Furthermore, institutions of higher education, under the supervision and control of the state, can also be established by private foundations in accordance with procedures and principles set forth in the law provided that they are non-profit in nature.

There is a tuition fee for higher education. However, successful students who lack financial means to continue their education are provided with full support by private individuals and organizations, as well as by the state.

Today, higher education institutions in Turkey fall into three categories: universities, military and police colleges and academies, and vocational schools affiliated with ministries.

The university is the principal higher education institution. It possesses academic autonomy and a public legal personality. It is responsible for carrying out high level educational activities, scientific research and publications. It is made up of **faculties, graduate schools, schools of higher education, conservatories, two-year vocational training schools** and **centers for applied work and research.**

A **faculty** is a higher education unit which is responsible for high level education, as well as for scientific research and publications. Units such as departments, schools of higher education, etc., may be affiliated with a faculty.

A graduate school in universities and in faculties is concerned with graduate study, scientific research and applied studies in more than one related subject area.

A **school of higher education** is an institution which is mainly concerned with offering instruction directed towards a specific vocation. Examples are the School of Home Economics affiliated with Ankara University and the School of Foreign Languages within Boğaziçi University.
A **conservatory** is a higher education institution which is concerned with the training of artists in the fields of music and the performing arts.
A **two-year vocational training school** is a higher education institution established for the purpose of providing vocational education to meet the practical needs of various fields.

2. MET INSTITUTIONS IN TURKEY

Istanbul Technical University Maritime Faculty
http://www.df.itu.edu.tr/

Dokuz Eylul University Maritime Faculty
http://www.denizcilik.deu.edu.tr/

Istanbul University Engineering Faculty Maritime Transportation
and Management Engineering Department
http://www.muh.istanbul.edu.tr/

Karadeniz Technical University Surmene Marine Sciences Faculty
http://www.deniz.ktu.edu.tr/

Piri Reis University Maritime Faculty
http://www.pirireis.edu.tr/

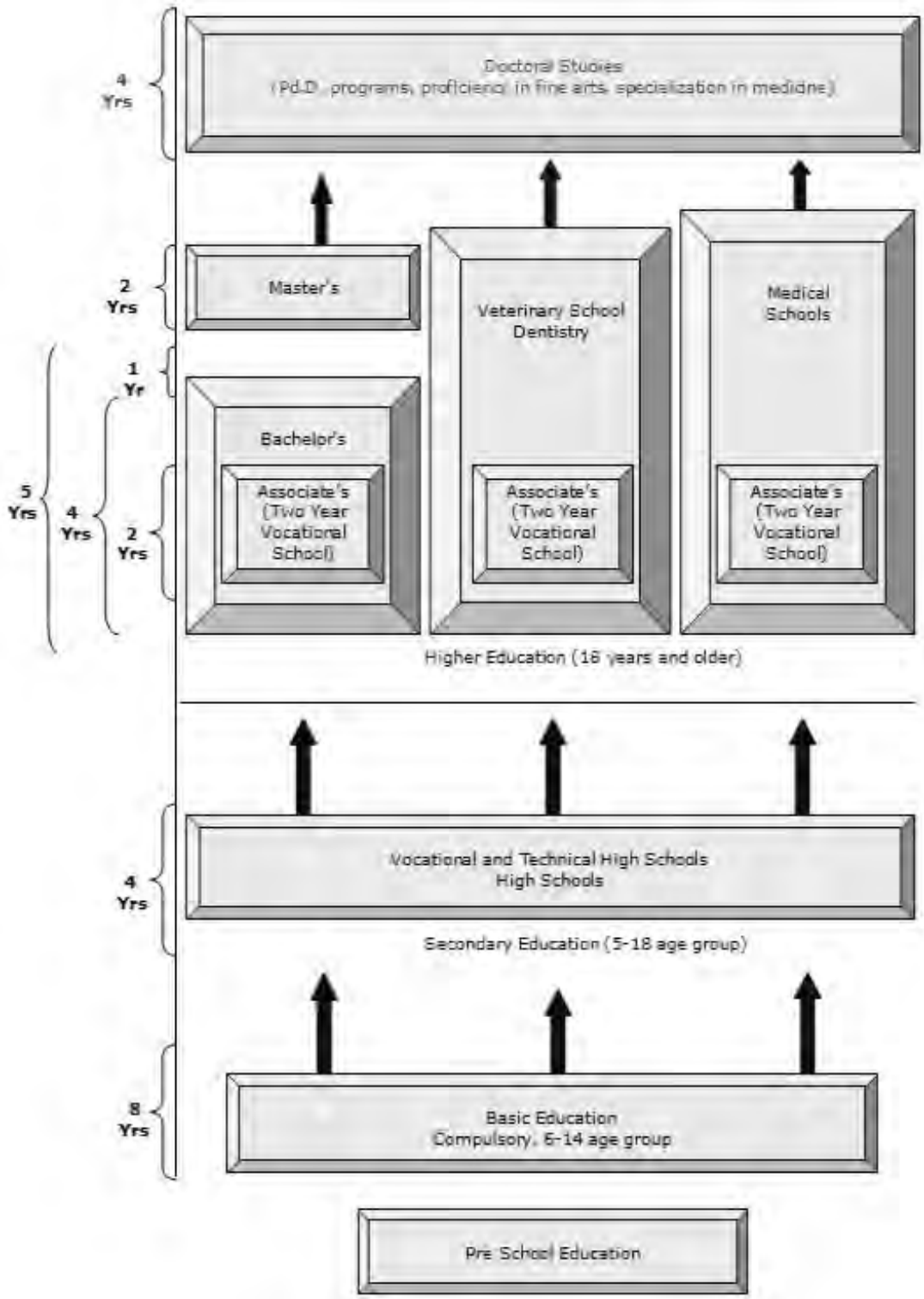
Rize University Turgut Kiran Maritime College
http://tkdyo.rize.edu.tr/

Near East University Maritime Faculty
http://www.neu.edu.tr/

Yildiz Technical University Naval Architecture and Maritime Faculty
http://www.gidf.yildiz.edu.tr/

Zonguldak Karaelmas University Maritime Management and Administration College
http://diyyo.karaelmas.edu.tr/

Kocaeli University Yildiz Bilge Barbaros Maritime College
http://www.kocaeli.edu.tr/


4 Yrs
Doctoral Studies
(Ph.D. programs, proficiency in fine arts, specialization in medicine)
2 Yrs
Master's
Veterinary School
Dentistry
Medical Schools
1 Yr
Bachelor's
5 Yrs
4 Yrs
2 Yrs
Associate's (Two Year Vocational School)
Associate's (Two Year Vocational School)
Associate's (Two Year Vocational School)
Higher Education (18 years and older)
4 Yrs
Vocational and Technical High Schools
High Schools
Secondary Education (5-18 age group)
8 Yrs
Basic Education
Compulsory, 6-14 age group
Pre School Education

3. GENERAL INFORMATION OF THE INSTITUTION

Name of the Institution: Istanbul Technical University Maritime Faculty
Dean: Prof. Dr. Nil GULER
Address: ITU Maritime Faculty, Postane Mah. Manastir Yolu, Tuzla, Istanbul
Phone: + 90 (216) 395 10 43, 395 10 09
Fax: + 90 (216) 395 45 00
URL: http://www.df.itu.edu.tr/
e-mail:gulern@itu.edu.tr
e-mail: denizcilikdek@itu.edu.tr

Structure of the Institution

ITU was established in 1773, during the time of the Ottoman Sultan Mustafa III. With its original name "Muhendishane-i Bahr-i Humayun", The Royal School of Naval Engineering, its responsibility was to educate chart masters and ship builders. In 1795, the "Muhendishane-i Berr-i Humayun", The Royal School of Military Engineering, was established to educate the technical staff in the army. In 1847, education in the field of architecture was also introduced.

Established in 1883, the School of Civil Engineering assumed the name "Engineering Academy", with the aim of teaching essentials skills needed in planning and implementing the country's new infrastructure projects. Gaining university status in 1928, the Engineering Academy continued to provide education in the fields of engineering and architecture until it was incorporated into ITU in 1944. Finally, in 1946, ITU became an autonomous university which included the Faculties of Architecture, Civil Engineering, Mechanical Engineering, and Electrical and Electronic Engineering.

With a history stretching back over 236 years, providing technical education within a modern educational environment and strong academic staff, ITU is strongly identified with architectural and engineering education in Turkey. Since its inception and foundation under Ottoman rule, ITU has constantly lead the way in reform movements, and in the latter era of the Republic of Turkey, ITU has assumed pivotal roles in the reconstruction, modernization, and administration of the country. The efforts and expertise of ITU graduates have been major contributors in the planning and construction of Turkey's roads, bridges, dams, factories, buildings, energy plants, communication networks, villages and cities. ITU is a state university which defines and continues to update methods of engineering and architecture in Turkey. It provides its students with modern educational facilities while retaining traditional values, as well as using its strong international contacts to mould young, talented individuals who can compete in the global arena.

ITU has 13 Faculties and 5 campuses including Tuzla. 18.000.000 undergraduate and 4.000 graduate students.

Maritime Faculty

The history of Maritime Faculty dates back to the ‘Merchant Navy Boarding School’ (Leyli Tüccar Kaptan Mektebi), which was established in 5 December 1884 at Heybeliada-Istanbul as a part of the Ottoman-Turkish Naval Academy with the aim of strengthening civilian navigation/seamanship in the country. During the Republican era, it’s named as the ‘High Navigation School’ and continued its activities in the following decades. Finally, in 1992, it is re-established as a ‘Maritime Faculty’ and tied to the Istanbul Technical University.

The Mission of Maritime Faculty is to excel in Maritime Research and Education.

In this mission, the specific aims are:

-To develop a sustainable and scientific educational background in order to graduate environmentally conscious maritime officers with analytical, creative and contemporary thinking, strong social and leadership skills, who will work in national and international vessels/sectors as well as being able to conduct research, development and production activities on land if necessary.

-To develop an interdisciplinary educational and research background in order to educate academicians who will contribute to knowledge and technology production and transfer, create positive impact on the national and international maritime sector while working under the guidance of scientific, engineering and maritime ethics.
-To work for the advancement of knowledge and technology production in the maritime field by participating in national and international interdisciplinary research activities.

The Vision of Maritime Faculty is:
-To develop the strategies and methods in the advancement of maritime education; and to become an interdisciplinary and dynamic scientific center of excellence which can adopt itself in line with the changing conditions as a part of a premier research university.

Structure:
Maritime Faculty is composed of an English preparatory school and an undergraduate school (BSc-4 Years). The 30% of curriculum is in English. Within the undergraduate school there are three academic departments. Currently, the one of those departments is only offering service courses to the two other active departments. The departments are namely; Marine Engineering Department (Engine), Maritime Transportation and Management Engineering Department (Deck), Basic Sciences Department (offering service courses).
Deck and Engine departments were established in 1988, by the transfer of the "Merchant Maritime College" from the administration of Turkish Naval Forces to ITU Administration.

Maritime Transportation and Management Engineering Department (Deck)
The mission of the department is to educate students as maritime officers able to work efficiently at operational and management level within the scope of National and STCW requirements.

Marine Engineering Department (Engine)
The mission of the department is to pioneer the Marine Engineering education in Turkey by maintaining a sustainable education program consisting not only of mathematics, science and engineering fundamentals, but also of contemporary design, manufacturing and management techniques, and marine engineering professional practices complying with International Standards and National Legislations.
While establishing such a program, the students are to be armed with communication, decision□making and problem solving skills along with the available latest technologic developments.

Basic Sciences Department:
Offers service courses to other departments

Graduate Programs:
Within ITU-Institute of Science and Technology the Maritime Faculty is offering taught MSc Programmes (started in 1992) and research oriented PhD Programmes (started in 2003). By means of these post-graduate programmes, the faculty supervised several MSc theses and PhD dissertations, and started the education of maritime academicians in the country.

Dual Diploma Programs:
Within ITU's international joint academic degree programmes framework, the Faculty also has a joint undergraduate degree programme with the State University of New York's (SUNY) Maritime Faculty. Within this programme the students follow courses in New York for one and a half years and the remaining education is concluded in Istanbul.

The dual diploma program with SUNY started in 2003 and graduates got their diploma in 2008. Furthermore, Maritime Faculty also has international academic collaborations in its teaching and research activities. Most importantly, Maritime Faculty is one of the founding universities of the International Association of Maritime Universities (IAMU) and therefore it has outstanding international reputation. The Simulator Laboratory/Centre of the Faculty provides visual education to the students and to the maritime sector in general by using several simulation models.

3.1 SIMULATORS CENTER

Full Mission Ship Handling Simulator

Goals
Applied ship handling training through computer simulation to complement the theoretical background of the Maritime Transportation and Management Engineering students. Simulations are directed towards the improvement of ship handling operations through the use of various ship types navigating under simulated weather and sea conditions in different seaways of the world. The simulator also serves the maritime industry for officer training purposes.
The second ship bridge is mainly used as radar mock-up, but is equipped with a 60° visual display system. The simulator enables an accurate replication of handling characteristics of vessels ranging from VLCCs to small patrol craft. Night and day light operations can be simulated in a wide variety of geographic locations and other sea areas can be constructed to meet requirements. The instructor station allows the instructor to set up, design and modify exercise and to control and monitor exercises. The Full Mission ship's bridge has a wheel house equipped with highly sophisticated instruments representing a real ship's bridge.

Specifications
The main bridge represents the core of the ship handling simulator. The computer generated optical view system creates a shifting from bridge center to wing a visibility of 240° horizontally via 7 CRT Projectors.
1 Control Room,
1 7-projector 240º wheelhouse simulator (360º view)
1 single-projector 42.5º wheelhouse simulator (360º view)
1 briefing room
1 route and scenario development console
Training for 2 groups of 5 people during one session.

Information
The Full Mission ship's bridge has a wheel house equipped with highly sophisticated instruments representing a real ship's bridge.

Arpa-Radar Simulator

Specifications
1 Control Room, 2 single-projector wheelhouse simulators ((360º view)
Training for 2 groups of 5 people during one session.

Information
The RADAR/ARPA Simulator includes 2 radar cubicles equipped with different navigational instruments. This simulator is predominantly used as radar booths, but is each equipped with a visual display system.

Each of the RADAR/ARPA cubicles includes following components:

2 consoles with ARPA-radar unit
steering-stand console
chart table with navigational set
Visual Generator with LCD Projectors

c) GMDSS Laboratory

Goals
Applied training on the full set of GMDSS sub-systems and communication techniques. This includes search and rescue operations, general communication procedures, emergency and safety communication procedures, etc… Also used in ROC (Restricted Operator's Certificate) and GOC (General Operator's Certificate) training for the maritime industry.

Specifications
1 CRS (Coastal Radio Station), LES (Land Earth Station), RCC (Rescue Coordination Center)
2 GMDSS operator consoles. Training for 2 groups consisting of 6 people during one session

Information
The GMDSS simulator is used to train and examine seafarers and cadets to obtain Restricted Operator Certificate (ROC) and General Operator Certificate (GOC). It covers a variety training requirements including the initial training of navigators. The GMDSS Simulator in ITUMF includes 2 complete GMDSS consoles equipped with different GMDSS replica instruments. The equipment of each console consists of the following components:

Radiotelephone VHF Simplex/duplex/55 Chs.
DSC Controller and receivers
Radiotelephone SSB MF and HF
DSC Controller and Receiver for MF and HF
Navtex
INMARSAT A-B-C
Radio telex (NBDP-TOR)
EPIRB and SART
Lat/long read out, Speed log and Gyro read-out

Liquid Cargo Handling Simulator (Tanker)

Goals
Applied normal and emergency tanker operation (oil, LNG, chemical product) training in accordance with governing international rules. Includes operational planning, load planning, cleaning, aeration, pollution control, etc… This training is available both for students and to the industry as regulated by STCW-95 and STCW A-V1

Specifications
LCHS 2000/LCC Petroleum Tanker Simulator
LCHS 2000/LCH Chemical / Product Tanker Simulator
LCHS 2000/LNG Liquefied Natural Gas Tanker Simulator
Training for 6 people at one session.

Information
This simulator is a PC based desktop system with 6 workstation and one instructor station.
· The Liquid Cargo Handling Simulator include the following features:
· The layout of the tanks, pipelines, valves and cargo handling machinery
· The cargo handling control arrangement

· The cargo monitoring system
· Alarms and Logging system
· Cargo handling facilities in normal and emergency modes Load Calculator

Computer Based Training Laboratory (CBT)

Goals
Improving simulator software code through cooperation with maritime software industry.
International or onboard maritime education through long-distance web learning. Improving maritime education and research through the efficient use of computer based technologies.

Specifications
1 server, 15 workstations, 2 projectors, 15 people capacity

Information
In CBT, it is possible to debrief and evaluate scenarios that held in ship handling simulator.
Two large screen projection system is available at the debriefing room. Since any exercise is recorded including exercise data and communication for debriefing purposes a recorded exercise can be retrieved from the database and replayed at this station.

Vessel Traffic System Sim/Lab (VTS)

Goals
Applied training of VTS operators. Especially important due to the constricted passages of the Turkish straits system (The Straits of Istanbul and Canakkale, Solent Passing etc.)

Specifications
3 VTS stations working in coordination with the shiphandling simulator.
Training for 3 people during one session.

Information
In system, own ships and instructor station can be linked to the VTS simulator for the training of VTS operators. For the simulation of external communication VHF Intercoms are integrated into the simulator system in between radar cubic and VTS trainee stations. The VTS Simulator exceeds the relevant recommendations as stated in IALA Model Courses V-103/1 and V-103.2.
The Maritime Faculty of Istanbul Technical University (ITUMF) was appointed as the training institute for newly employed VTS Operators by Turkish Competent Authority.
ITUMF has carried out the required training, using its own VTS and bridge simulators.

Engine Room Simulator

Goals
The main goal of laboratory is to improve knowledge and skills of Marine Engineering Department's students at managerial level using simulation technique. In advanced studies, it is expected to satisfy several viewpoints for students using various failure scenarios regarding with ship machinery systems. Risk management, human factor analysis, emergency planning, and human reactions under emergency conditions are the main research themes.

Specifications
7 workstations
3 remote control units

1 main control room (for instructor)
Training in 10 independent units
Other system components

Number of Researcher
Lecturer (2), Technician (1)

Capacity of Laboratory
It is suitable for carrying out research activities in 10 independent units at the same period.

3.2 CONTINUING EDUCATION CENTER

As a leading Maritime Education and Training Center, ITUMF extends its training activities through the maritime industry.
Utilizing state of the art facilities and reputable MET experience of ITUMF, Continuing Education Center organizes training programs in compliance with STCW□95 and other international standards.

ITUMF CEC offers following training programs:
Basic Safety
Maritime Safety
Medical and First Aid
Fire Fighting
Tanker Training
ISPS
Ship Handling / Bridge Procedures
Navigation and Radar
Radio Communication
Other Training Programs

Basic Safety Training
Survival at Sea
Elementary Fire Fighting
Elementary First Aid
Personal Safety and Social Responsibility
Survival Craft and Rescue Boat

Maritime Safety Training
Ro□Ro Passenger Ship Safety Course for Masters and Officers
Passenger Ship other than Ro□Ro Passenger Safety Course Certificate for Masters and Officers
Ro□Ro Passenger Ship Safety Course Certificate for Ratings
Proficiency in Survival Craft & Rescue Boat

Medical and First Aid
Medical First Aid
Elementary First Aid
Medical Care

Fire Fighting
Advanced Fire Fighting
Fire Fighting

Tanker Training
Specialized Training Programme on Chemical Tanker Operations
Specialized Training Programme on Oiltanker Operations
Crude Oil Washing (COW) Training
Oil Tanker Familiarization
Liquefied Gas Tanker Familiarization
Chemical Tanker Familiarization
Cargo and Ballast Handling

ISPS
Port Facility Security Officer Training
Company Security Officer Training
Ship Security Officer Training

Ship Handling/Bridge
Ship Handling
Bridge Team Management

Navigation and Radar
ARPA / RADAR
Radar Observation and Plotting
ECDIS Operator

Radio Communication
General Operator Certificate
Restricted Operator Certificate
Coast Station Operators Training

Other Training Programs
Engine Room Resource Management
Maritime English Training
SMCP
VTS Operator Training

3.3 ITUMF AT INTERNATIONAL / NATIONAL MET PLATFORMS

Establishment of the International Association of Maritime Universities
(Founding Chair)

Establishment of Black Sea Association Of Maritime Institutions
Respectability at IMO (STW Chairman of MET Issues Of 162 Administrator Parties to IMO between 2000-2002)

Bilateral Agreements with Kobe University, Maritime College State University of New York, Dalian Maritime University, Sanghai University, Jimei University, Batumi Maritime Academy, Constanta Maritime Academy, National Korea Maritime University, Mokpo National Maritime University, Technical University of Varna, Cal Maritime University, Admiral Makarov State Maritime Academy, Dong-A University

Very Strong Cooperation with Turkish Undersecretariat of Maritime Affairs

Consultation Work to Turkish Maritime Sector
Establishment of Global Onboard Training Center in Diplomatic Conference in Manila June 2010

Consultation Work to other Turkish MET Universities

Consultation to the Turkish Government

- IMO Competent Persons (3)
- New Merchant Maritime Act
- VTS Training
- Seafarers Examination Center
- Marine Safety Training Center

Employment of ITUMF Cadets by International Ship Owners
- TEEKAY (CANADA), CHEVRON (USA)
- NYK (JAPAN), ZODIAC (UK / ISRAEL)

Strong Relations with INTERTANKO, INTERCARGO
Cooperation with Japanese MET Institutions
- (KUMM / TUMM / ASHIYA)

Turkish Officers for Japanese Fleet
Cooperation with CLASS NK of JAPAN in Setting the International MET Quality Standards (CLASS NK ISO 9000 / ISO 14000 Accreditation)

4. RESEARCH & DEVELOPMENT ACTIVITIES

•Enhancement of Port State Control Facilities in Developing Countries Taking into Account the Human Factor
•Shore Based Proficiency Designation for Ship Management Companies
•Energy Economy in Marine Engines and Ships
•Research Proposal on Human Failure by Using Eye Movement Analyzer (EMA)
•Simulation of Oil Spills in Bosphorus
•Oil Spill Detection Using Radar Satellite Images
•Human Factor Research Study for Maritime Safety Management Using
Engine Room Simulator (ERS) and Eye Mark Recorder (EMR)
•ERS as a Field for Research on Safety Management
ERS Education & Training Model at ITUMF and Its Improvement, “The Effective Training Method for Marine Engineers: Ships in Service, Training Ships or Engine Room Simulators
A Comparative Study of Training Methods for Training and Education of Marine Engineering Students of IAMU Universities
Improvement of Marine Engineering Curriculum Using The Engine Room Simulator
"Baseline Study, and the Preparation towards the XXIst Century Undergraduate Deck and Engine Curricula of Istanbul Technical University, Maritime Faculty,"
A Comparative Study of Training Methods for Training and Education of Marine Engineering Students of IAMU Universities
A Proposal for Marine Engineering Institutions to Organize the Effective Training Method
Vibration Absorber for Flexible Structures: Experimental Study under Random and Sinusoidal Excitations”, International Mechanical Engineering Congress & Exposition. Symposium on Nonlinear Dynamics and Stochastic Mechanics
Design of a new MIL□STD□1553 B Based Integrated Communication System for Replacement of a Legacy System
"The Vital Link: Using Lab VIEW to Develop the Ground Processing Interface System (GPIS)

Software for the C□5 Galaxy Aircraft
Port Maneuvering Analysis
Human resource development at ports
Development of Econometric Graphic Model for the Comparison of Voyage Consumption and Charter Performance Preparation of Ship Feasibility Reports
Supervising for the Preparation of Ship Management Contracts
Analyzing of Ship Investments and Running Costs
Preparation of Expert Reports for Ship Accidents or Casualties
Integration of ISO 14001 (Environmental Management Standard) into Ship Management Companies
Integration of Quality and Safety Management System into Ship Management Companies
Engine Curricula of the Preparation Towards the XXIst Century Undergraduate Deck and Istanbul Technical University, Maritime Faculty
"ITUMF Maritime English Education & Training Model
Port Feasibility Reports

5. ACADEMIC ACTIVITIES :

Academic Activities at ITU Maritime Faculty between the Years 2002-2008

	NATIONAL										INTERNATIONAL									
	CONGRESS	CONFERANCE	SYMPOSIUM	PROCEEDING	ABSTRACT	SEMİNER	AUTHOR	EDITORSHIP	PAPER	PUBLICATION	CONGRESS	CONFERANCE	SYMPOSIUM	PROCEEDING	ABSTRACT	SEMİNER	AUTHOR	EDITORSHIP	PAPER	PUBLICATION
2002-2003	-	1	1	29	-	10	8	-	5	14	8	9	2	7	5	11	2	-	10	24
2003-2004	-	-	1	30	-	2	1	-	4	4	5	3	2	29	2	3	-	1	3	1
2004-2005	-	-	-	19	-	3	6	-	2	6	6	4	2	23	2	2	-	-	-	-
2005-2006	-	-	2	8	-	1	2	-	1	10	1	4	1	31	3	-	-	-	4	3
2006-2007	-	-	-	43	-	-	1	1	6	19	2	11	4	60	2	-	-	-	10	18
2007-2008	-	-	1	26		5	5	3	4	6	1	4	2	35	4	1	2			

UNDERGRADUATE	
Department	Number of Students
Maritime Transp. Engineering	608
Marine Engineering	306
SUNY- Maritime Transp. Engineering	90
SUNY- Marine Engineering	70
TOTAL	1074

GRADUATE	
	Number of Students
MASTER -continuing -completed	22 67
PH.D -continuing -completed	23 3
TOTAL	105

ITU MF ACADEMIC STAFF				
	MARINE ENGINEERING DEPARTMENT	DEPT.OF MARITIME TRANSPORT. ENGINEERING	BASIC SCIENCES DEPARTMENT	TOTAL
Prof.	…	3	…	3
Assoc.Prof.	1	…	…	1
Ass.Prof.	1	6	2	9
Lecturer (Dr.)	1	2	1	4
Lecturer	2	13	4	19
Research Assistant	5	8	2	15
Total	10	32	9	51
Part Time Lecturer 26				

6. STRUCTURE OF PROGRAMS

Major Programs

Maritime Transportation and Management Engineering Department

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 103E	Mathematics I	4	3	2	0	TB	Z	1
FIZ 101E	Physics I	3	3	0	0	TB	Z	1
FIZ 101EL	Physics I Lab.	1	0	0	2	TB	Z	1
BIL 101E	Int. to Comp. and Inf. Systems	1.5	1	0	1	TM	Z	1
RES 103E	Technical Drawing	3	2	0	2	TM	Z	1
DFH 101E	Maritime Chemistry	2.5	2	0	1	TB	Z	1
GUV 101E	Seamanship 1	2	2	0	0	MT	Z	1
GUV 111E	Introduction to Navigation	4	3	0	2	MT	Z	1
DFH 191E	Survival at Sea I	0	4	0	4	MT	Z	1

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 104E	Mathematics II	4	3	2	0	TB	Z	2
FIZ 102E	Physics II	3	3	0	0	TB	Z	2
FIZ 102EL	Physics II Lab.	1	0	0	2	TB	Z	2
STA 102E	Statics	2	2	0	0	TM	Z	2
DFH 142E	Maritime English	1.5	1	0	1	ITB	Z	2
GUV 102E	Seamanship II	1.5	1	0	1	MT	Z	2
GUV 112E	Terrestial Navigation	3.5	2	0	3	MT	Z	2
GUV 122E	Watchkeeping Standards I	2.5	2	0	1	MT	Z	2
BIL 106E	Intr to Sci&Eng Comp (Fortran)	3	2	0	2	TM	Z	2
BED 102E	Phsical Education	0	0	0	2	ITB	Z	2

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 261E	Linear Algebra	3	3	0	0	TB	Z	3
DNK 201E	Dynamics	3	3	0	0	TM	Z	3
GUV 201E	Elektronics	2	2	0	0	TM	Z	3
GUV 261E	Ekonomics	2	2	0	0	ITB	Z	3
MAT 291E	Statistics	2	2	0	0	TB	Z	3
TUR 101	Turkish I	2	2	0	0	ITB	Z	3
GUV 211E	Celestial Navigation I	4	3	0	2	MT	Z	3
GUV 231E	Ship Construction	2	2	0	0	MT	Z	3
GUV 241E	Maritime English for Mar.Trans.Eng. I	2	2	0	0	ITB	Z	3

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 201E	Differential Equations	4	4	0	0	TB	Z	4
GUV 361E	Shipping Business I	2	2	0	0	MT	Z	4
GUV 202E	Marine Communication	3.5	3	0	1	MT	Z	4
GUV 212E	Celestial Navigation II	4	3	0	2	MT	Z	4
TUR 102	Turkish II	2	2	0	0	ITB	Z	4
GUV 222E	Ship Maneuvering	1.5	1	0	1	MT	Z	4
GUV 232E	Electronical Navigation I	2	2	0	0	MT	Z	4
GUV 242E	Maritime English for Mar.Trans.Eng. II	2	2	0	0	ITB	Z	4
DFH 291E	Survival at Sea II	0	1	0	2	MT	Z	4

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GUV 301E	Meteorology I	3	2	0	2	MT	Z	5
GUV 311E	Cargo Handling and Ship Stability I	3.5	3	0	1	MT	Z	5
GUV 321E	Watchkeeping Standards II	2.5	2	0	1	MT	Z	5
GUV 331E	Electronical Navigation II	2	2	0	0	MT	Z	5
GUV 341E	Maritime English for Mar.Trans.Eng. III	2	2	0	0	MT	Z	5
GUV 351E	Maritime Practical Studies	4	0	0	8	MT	Z	5
GUV 371E	Maritime Law I	3	3	0	0	ITB	Z	5
DFH 292E	Survival at Sea III	0	1	0	1	MT	Z	5

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GUV 391E	Long Term Sea Training	15	0	0	0	MT	Z	6

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GUV 401E	Marine Engines	2	2	0	0	MT	Z	7
ATA 101	His. of Turkish Revolution I	2	2	0	0	ITB	Z	7
GUV 411E	Cargo Handling and Ship Stability II	3.5	3	0	1	MT	Z	7
GUV 421E	Transportation Systems	2	2	0	0	MT	Z	7
GUV 461E	Shipping Bussines II	2	2	0	0	MT	Z	7
GUV 471E	Maritime Law II	3	3	0	0	ITB	Z	7
	7th Semester Elective Course (MT)	3				MT	S	7

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GUV 402E	Maritime Meteorology II	2	2	0	0	MT	Z	8
GUV 412E	Ship Management	6	4	0	4	MT	Z	8
GUV 422E	Personnel Management	2	2	0	0	MT	Z	8

GUV 442E	Maritime English for Mar.Trans.Eng. IV	2	2	0	0	ITB	Z	8
GUV 492E	Graduation Project	3	0	0	6	MT	Z	8
ATA 102	His. of Turkish Revolution II	2	2	0	0	ITB	Z	8
	8th Semester Elective Course (MT)	3				MT	S	8

Marine Engineering Department

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 103E	Mathematics I	4	3	2	0	TB	Z	1
FIZ 101E	Physics I	3	3	0	0	TB	Z	1
FIZ 101EL	Physics Lab. I	1	0	0	2	TB	Z	1
BIL 101E	Int.To Computers. and Inf. Systems	1.5	1	0	1	TM	Z	1
DFH 101E	Maritime Chemistry	2.5	2	0	1	TB	Z	1
RES 103E	Technical Drawing	3	2	0	2	TM	Z	1
GMI 101E	Introduction to Marine Engineering	2	2	0	0	TM	Z	1
GMI 121E	Mechanical Workshop	2.5	1	0	3	MT	Z	1
DFH 191E	Maritime Safety I	0	4	0	4	MT	Z	1
Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 104E	Mathematics II	4	3	2	0	TB	Z	2
FIZ 102E	Physics II	3	3	0	0	TB	Z	2
FIZ 102EL	Physics II Lab.	1	0	0	2	TB	Z	2
STA 102E	Statics	2	2	0	0	TM	Z	2
RES 102E	Computer Aided Technical Drawing	2.5	1	0	3	MT	Z	2
GMI 102E	Introduction to Marine Engines	2	2	0	0	MT	Z	2
DFH 142E	Maritime English	1.5	1	0	1	ITB	Z	2
GMI 122E	Manufacturing Methods	3	2	0	2	MT	Z	2
BIL 108E	Intr. to Sci. & Eng.Computing	3	2	0	2	TM	Z	2
BED 102E	Physical Education	0	0	0	2	ITB	Z	2
Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 261E	Linear Algebra	3	3	0	0	TB	Z	3
DNK 201E	Dynamics	3	3	0	0	TM	Z	3
GMI 201E	Marine Electrotecnics	3	3	0	0	MT	Z	3
GMI 211E	Thermodynamics I	2	2	0	0	TM	Z	3
GMI 221E	Naval Architecture and Stability	3	3	0	0	MT	Z	3
GMI 231E	Numerical Analysis of Engineering System	2	2	0	0	TM	Z	3

GMI 241E	Material Sciences	2	1	0	2	TM	Z	3
TUR 101	Turkish I	2	2	0	0	ITB	Z	3
GMI 271E	Maritime English for Marine Eng. I	2	2	0	0	ITB	Z	3
DFH 291E	Maritime Safety II	0	1	0	2	MT	Z	3

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MAT 201E	Differential Equations	4	4	0	0	TB	Z	4
GMI 232E	Marine Diesel Engines I	2.5	2	0	1	MT	Z	4
GMI 222E	Marine Electronics	2.5	2	0	1	MT	Z	4
GMI 212E	Thermodynamics II	2.5	2	0	1	TM	Z	4
GMI 242E	Strength of Material	2.5	2	0	1	TM	Z	4
GMI 252E	Auxiliary Machinery I	2.5	2	0	1	MT	Z	4
TUR 102	Turkish II	2	2	0	0	ITB	Z	4
GMI 301E	Maritime Law	2	2	0	0	ITB	Z	4
GMI 272E	Maritime English for Marine Eng.II	1.5	1	0	1	ITB	Z	4
DFH 292E	Maritime Safety III	0	1	0	1	MT	Z	4

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GMI 331E	Marine Diesel Engines II	2.5	2	0	1	MT	Z	5
GMI 311E	Marine Power Plants Operation I	2.5	2	0	1	MT	Z	5
GMI 321E	Machinery Elements	2	2	0	0	TM	Z	5
GMI 341E	Automatic Control Systems	2.5	2	0	1	TM	Z	5
GMI 351E	Heat Transfer	3	3	0	0	TM	Z	5
GMI 361E	Fluid Mechanics	2.5	2	0	1	TM	Z	5
ATA 101	His. of Turkish Revolution I	2	2	0	0	ITB	Z	5
GMI 381E	Ers I	3	1	0	4	MT	Z	5
GMI 371E	Maritime English for Marine Eng.III	2	2	0	0	ITB	Z	5

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GMI 391E	Long Term Sea Training	15	0	0	0	MT	Z	6

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GMI 401E	Propeller and Shafting	3	3	0	0	MT	Z	7
GMI 421E	Steam and Gas Turbines	2.5	2	0	1	TM	Z	7
GMI 411E	Marine Power Plants Operation II	3	2	0	2	MT	Z	7
GMI 451E	Auxiliary Machinery II	3	3	0	0	MT	Z	7
GMI 431E	Refrigeration and HVAC Systems	2.5	2	0	1	TM	Z	7
GMI 441E	Computation of Marine Diesel Engines	3	3	0	0	MT	Z	7

	7th Semester Elective Course (ITB)	3				ITB	S	7

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
GMI 412E	Hydraulic and Pneum. Cont. of Systems	2	2	0	0	TM	Z	8
GMI 422E	Survey Procedures	2	2	0	0	TM	Z	8
GMI 432E	Quality and Safety Management	2	2	0	0	TM	Z	8
GMI 482E	Ers II	3	1	0	4	MT	Z	8
GMI 442E	Maritime Rules and Regulations	2	2	0	0	ITB	Z	8
GMI 472E	Maritime English for Marine Eng.IV	3	3	0	0	ITB	Z	8
ATA 102	His. of Turkish Revolution II	2	2	0	0	ITB	Z	8
GMI 492E	Graduation Work	3	0	0	6	MT	Z	8
	8th Semester Elective Course (MT)	3				MT	S	8

Dual- Degree Programs

Maritime Transportation and Management Engineering Department

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MTH 121	Calculus I	4	4	0	0	-	Z	1
PHY 111	Physics I	4	4	0	0	-	Z	1
CMP 113	Introduction to Business Computing	3	2	0	2	-	Z	1
MRT 101	Maritime English	2	2	0	0	-	Z	1
MRT 105	Professional Studies I	3	2	0	2	-	Z	1
EAS 111	Technical Drawing	2	1	0	2	-	Z	1
TUR 101	Turkish I	2	2	0	0	-	Z	1
ATA 101	History of Turkish Revolution I	2	2	0	0	-	Z	1
ULP 101	New Begin.Fresh.Sem.& Serv. to Leader. I	0	0	2	0	-	Z	1

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRT 321	Introduction to Cargo Operations and Ship Stability	3	3	0	0	-	Z	5
MRT 311	Ship Handling & Maneuvering	2	2	0	0	-	Z	5
MRT 313	Electronic Navigation	4	3	0	2	-	Z	5
MRT 307	Nautical Operations-Legal	2	2	0	0	-	Z	5
MRT 309	Nautical Operations-Safety	2	2	0	0	-	Z	5
MRT 325	Maritime Communication	3	2	0	2	-	Z	5
MRT 327	Watchkeeping	4	3	0	2	-	Z	5

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRT 312	On Board Training (Ship Operation and Management III)	6	0	0	12	-	Z	6
MRT 314	Sea Project	4	0	0	8	-	Z	6
Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRT 401	Analysis of the Marketing Process	3	3	0	0	-	Z	7
MRT 431	Oceanography	2	2	0	0	-	Z	7
MRT 405	Admiralty Law	3	3	0	0	-	Z	7
MRT 407	Cargo Operations	3	2	0	2	-	Z	7
MRT 409	Advance Navigation	2	1	0	2	-	Z	7
TUR 102	Turkish II	2	2	0	0	-	Z	7
ATA 102	History of Turkish Revolution II	2	2	0	0	-	Z	7
MRT 415	Physical Education I	1	0	0	2	-	Z	7
Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRT 422	Bridge Resource Management	3	1	0	4	-	Z	8
MRT 412	Management Seminar	3	3	0	0	-	Z	8
MRT 406	Chartering	2	2	0	0	-	Z	8
MRT 402	Marine Insurance	3	3	0	0	-	Z	8
MRT 410	Port and Terminal Operations	3	3	0	0	-	Z	8
MRT 492	Graduation Project	3	0	0	6	-	Z	8
MRT 408	License Seminar	2	0	0	4	-	Z	8
MRT 414	Physical Education II	1	0	0	2	-	Z	8
ULP 102	New Begin.Fresh.Sem.& Serv. to Leader. II	0	0	2	0	-	Z	8

Marine Engineering Department

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MTH 121	Calculus I	4	4	0	0	-	Z	1
PHY 111	Physics I	4	4	0	0	-	Z	1
CMP 111	Introduction to Engineering and Computers	3	2	0	2	-	Z	1
MRE 101	Maritime Engineering Drawing and Design	3	2	0	2	-	Z	1
MRE 105	Professional Studies I	3	2	0	2	-	Z	1

MRE 107	English for Eng. Officers	2	2	0	0	-	Z	1
TUR 101	Turkish I	2	2	0	0	-	Z	1
ATA 101	History of Turkish Revolution I	2	2	0	0	-	Z	1
ULP 101	New Begin.Fresh.Sem.& Serv. to Leader. I	0	0	2	0	-	Z	1

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRE 309	Numeric Analysis	3	3	0	0	-	Z	5
MRE 311	Marine Electronics	3	2	0	2	-	Z	5
MRE 321	Fluid Mechanics	3	3	0	0	-	Z	5
MRE 343	Ship Systems III:Marine Diesel Engines I	3	2	0	2	-	Z	5
MRE 361	Naval Architecture and Ship Construction	3	3	0	0	-	Z	5
MRE 371	Marine Plant Operation with ERS I	3	1	0	4	-	Z	5
	5.yy Elective Course	3				-	S	5

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRE 330	Long Term Sea Training	6				-	Z	6

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRE 443	Ship Systems IV:Marine Diesel Engines II	3	2	0	2	-	Z	7
MRE 453	Ship Systems V:Marine Auxiliary Machinery III	3	2	0	2	-	Z	7
MRE 471	Automatic Control Systems	3	3	0	0	-	Z	7
TUR 102	Turkish II	3	3	0	0	-	Z	7
MRE 431	Labor Law	3	3	0	0	-	Z	7
MRE 463	Marine Engineering Materials	3	3	0	0	-	Z	7
	7.yy Elective Course I	3				-	S	7
	7.yy Elective Course II	2				-	S	7

Course Code	Course Name	Credits	Course	Practice	Lab	Type	C/E	Semester
MRE 442	Surveying Procedures	3	3	0	0	-	Z	8
MRE 454	Ship Systems VI:Steam and Gas Turbine	3	3	0	0	-	Z	8
MRE 472	Marine Power Plant Operations with ERS II	3	1	0	4	-	Z	8
MRE 432	Maritime Law	3	3	0	0	-	Z	8
MRE 492	Graduation Project	3	0	0	6	-	Z	8
ATA 102	History of Turkish Revolution II	2	2	0	0	-	Z	8
ULP 102	New Begin.Fresh.Sem.& Serv. to Leader. II	0	0	2	0	-	Z	8
	8.yy Elective Course I	3				-	S	8
	8.yy Elective Course II	2				-	S	8

Maritime Transportation and Management Engineering Department Labs
Full□mission Shiphandling Simulator
Shiphandling Simulator
VTS Simulator
The Global Maritime Distress and Safety System(GMDSS) Simulator
Maritime Communication Laboratory
Liquid Cargo Handling Simulator
Computational Fluid Dynamics Laboratory
M/V Akdeniz Training Ship & Hopa Service Boat
Maritime Navigation Laboratory
Seamanship Laboratory
CBT (Computer Based Training Laboratory)
Lifeboat Training Platform
Performance Measurement Labaoratory
Fire Training Center
Indoor Training Pool

Marine Engineering Department Labs
Engine Room Simulator
M/V Akdeniz, Hopa Srvice Boat Engine Rooms
Diesel Engine Laboratory
Machine Shop
Automatic Control Laboratory
Hydraulics and Pneumatics Laboratory
Measurement Devices Laboratory
Thermal Engines Laboratory
Electrical Circuits Laboratory

7. TRAINING SHIPS

M/V Akdeniz

M/V Akdeniz was built by A.G.Weser in Bremen and entered service for Turkish Maritime Lines in 1955. The twin screw, 144.31 meter ship is powered by two M.A.N. diesels with an output of 3620 horse power each, she can achieve 16 knot service speed currently which was 19 knots originally. Her original capacity was amongst 82 in superb first class accommodation, 370 in tourist class, and 554 in dormitory/deck class. She served on the Istanbul- Izmir and Black Sea Express service. After 1960, She served the 25-day Istanbul to Barcelona route via Piraeus, Naples, Genoa and Marseilles, with occasional Calls to Beirut and Alexandria (until the Lebanese civil war). In 1980s, She began Istanbul-based cruise service. And after a modification in 1989-90 her passenger capacity was decreased to 314 w here her ali cabinets having fully wc/bathroom and air-conditioned. She continued her cruise service until the date she was handed over to the ITU Maritime Faculty during an official ceremony on 2nd July 1997. And She has being served as a training vessel since then her cruise service until the date she was handed over to the ITU Maritime Faculty during an official ceremony on 2nd July 1997. And She has served as a training vessel since then.

Specifications:
Lenght: 144.31 m
Length BP: 132.00 m
Breadth: 18.60 m
Depth: 13.60 m
GRT: 8809
NRT: 4896

MTA Sismik-1 (+) 1 A5 Service Ship (+) M

Specifications:
Lenght: 56.69 m
Length BP: 52.00 m
Breadth Moulded: 880 m
Depth: 4.70 m
Engine Power: 1050 BHP
Summer Freeboard: 259 mm
Winter Freeboard: 341 mm
GRT: 667
NRT: 200

Hopa-1 (+) 1A3 L Service Boat (+) M

Length BP: 31.850 m
Breadth Moulded: 8.020 m
Depth Moulded: 3.460 m
Summer Freeboard: 543 mm

Engine Power: 2 x 300 BHP
DWT: 300
NRT: 90.31
GRT: 220

İTÜ Martı Service Boat

Lenght: 15,46 m
Breadth: 4.50 m
Depth: 2.29 m
NRT: 24.46
GRT: 45.34

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>GULER</td><td>NIL</td><td>Ph.D</td><td></td><td>Professor</td></tr>
<tr><td rowspan="3">TEL. +90 216 395 10 43
FAX: +90 216 395 45 00
MOBILE: +
EMAIL: gulern@itu.edu.tr
ADDRESS: Istanbul Technical University Maritime Faculty
Postane mah. Manastir Yolu,
Tuzla-Istanbul</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. English
2. German
3. Turkish (mother tongue)</td><td colspan="3">1.
2.
3.</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Port Management
2. Maritime Transportation
3. Construction Management</td><td colspan="2">1. Economic Analysis in Maritime Management
2.Advanced Port Management
Cruising Management
3.Container Terminal Management
4.Engineering and Scientific Computation</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1.Özcan Arslan, Nil Güler, "Kimyasal Tanker İşletmeciliği İçin Stratejik Yönetim Modellemesi,", İTÜ Dergisi, 10/2009, Doktora Tezi Makalesi
2.İhsan A. Çakar, Nil Güler, "Türlerarası konteyner taşımacılığı çözümleri: İzmir Limanı Örneği,", İTÜ Dergisi, 11/2009, Doktora Tezi Makalesi
3. Özcan Arslan, Murat Durucu, Nil Güler, "Design of a training room for a tanker company with respect to ergonomic considerations,", 10/2009, s. 935-939, 13th Congress of International Maritime Association of Mediterranean I, İstanbul / Turkey, .2009)
4:, Emrah Bulut, Nil Guler "Multi-criteria decision making and combination with financial aspects for ship investment analysis", 10/2009, 13th Congress of International Maritime Association of Mediterranean I, İstanbul / Türkiye, 12.10.2009
5. Özcan Arslan, Nil Güler, "Türk kimyasal tanker filosunun sayısal incelenmesi,", 11/2009, s. 192-205, Gemi Makineleri İşletme Mühendisleri 4. Ulusal Sempozyumu, İstanbul / Türkiye, 13.11.2009 - 13.11.2009</td></tr>
</table>

5.2.8 Karadeniz Technical University,Faculty of Marine Science (Turkey)

1. GENERAL INFORMATION OF THE INSTITUTION

The Maritime Transportation and Management Engineering department, founded in 1996, as Deck department, aims at training students in master mariner education and maritime studies. Students coming to the department with the university entry exam system are also passed through an interview and a physical proficiency test for further selection. Students whose English is inadequate attend the English Preparatory Class of the Karadeniz Technical University (KTU) Department of Language for one year, before starting their undergraduate course. Throughout their undergraduate education, cadets are required to attend at least to 30 % of their classes in the English language, and the remainder in Turkish.

The education in the department is carried out according to the customs and regulations of International Maritime Organization (IMO). The students of the department graduate with the Maritime Transportation and Management Engineering Bachelor's Degree. After completing six terms successfully (STCW 78/95'in A-II/1) , students who have passed the national qualified exam became an Unlimited Watchkeeping Officer (OOW). Graduate students (completed STCW 78/95 A-II/2) can be an Unlimited Chief Officer and Unlimited Master after becoming OOW 2 years and 4 years, respectively.

Our department has been involved in international cooperation in EU's Universities for Erasmus-Socrates programme.

Department of Maritime Transportation and Management Engineering has a modern campus located in Trabzon-Sürmene. In the department, full mission bridge simulator, GMDSS simulator, navigation, seamanship, safety and computer laboratories are available. Department also has Maritime Safety Training Centre. Other facilities on our campus are student dormitory and sport hall. This department approved by Undersecretary Maritime Affairs also, it is periodically assessed by RINA Italy Certification Company, for the renewal of ISO 9001:2000 Quality Management System Certificate, which was acquired through the said company.

For the seafarers, the Department provides tailor-made training programs and also offers all courses and A-II/2, A-II/1, A-II/3, A-III/1, A-III/2 and A-III/3 in the STCW 78/95 framework and ISPS.

Highly qualified teachers, engineers, instructors, the majority of which have practical maritime experience work at chairs, laboratories, and training centres.

About 500 cadets study at The Maritime Transportation and Management Engineering department. The annual graduation is about 80 specialists (60 deck off. and 20 marine eng)

Graduates of the department could work in the Undersecretary Maritime Affairs, Turkish and Foreign Ships, General Directory of Coastal Safety and Salvage, harbour administration, agencies, harbour management, broker and chartering companies, and training institutions.

Karadeniz Technical University
Faculty of Marine Sciences
The Maritime Transportation and Management Engineering Department
Sürmene/TRABZON
Turkey
Phone: +904627464045 e-posta: guverte@ktu.edu.tr
Fax: +904627464046
www.deniz.ktu.edu.tr/duim

Qualification Awarded

The students who have successfully completed all of the thought courses of the programme with 240 ECTS credits, achieved a CGPA of at least 2.00 out of 4.00 and had a pass grade from the Professional placement period and the report prepared therein are given Bachelor's Degree in MARITIME TRANSPORTATION AND MANAGEMENT ENGINEERING

Level of Qualification: First Cycle Degree

Mode of Study: Full Time

Admission & Registration Requirements

1 - High school diploma,
2 - Obtaining the required grade from National University Entrance and Placement Exam (ÖSS),
3 - English proficiency (500 from TOEFL / 6 from IELTS),
4 - Seafarer Healthy Certificate,
4 - Physical competency exam and Interview

Recognition of Prior Learning

Recognition of prior learning is at the beginning stage in the Turkish Higher Education System. Karadeniz Technical University and hence the Department of Maritime Transportation and Management is no exception to this. However, exams of exemption are organised at the start of each term at the University for courses compulsory in the curriculum, such as Foreign Languages and Basic Computing. The students who have completed the learning process for these courses on his/her own or through other means, and believe that they have achieved the learning outcomes specified are given the right to take the exemption exam. The students who achieve a passing grade from these exams are held exempt from the related course in the curriculum, and this grade is entered into the transcript of the student.

Qualification Requirements and Regulations

Certificate of English proficency, Passing all courses, a year oversea training practice. The degree is awarded to students who have successfully completed all the courses in the curriculum including summer practices, with a CGPA of 2.00 out of 4.00.

Profile of the Programme

The department of Maritime Transportation and Management Engineering is committed to addressing the educational and research needs to ensure sustainable management of the maritime resources. Main research activities involve ship handling, port and agency management.

Examination, Assessment and Grading Regulations

The examination, assessment and grading regulations have been set up for the university by the University Senate and the Department of Maritime Transportation and Management is bound by these regulations. Each course is assessed via a midterm exam, a second mid-term exam composed of quizzes, homeworks and assignments, and a final end-of-term exam, with contributions of 30%, 20% and 50% respectively. The marking is made out of 100. Grades of 81-100 is assigned a letter grade of AA, 76-80 BA, 70-75 BB, 60-69 CB, 50-59 CC, 45-49 DC, 40-44 DD, 30-39 FD and 0-29 FF. The AA is the highest grade and has a grade credit of 4.00, BA 3.5, BB 3.0, CB 2.5, CC 2.0, DC 1.5, DD 1.0, FD 0.5 and FF 0.0. Grades of AA to CC are pass, DD to FF fail, and DC is conditional pass and requires a CGPA of at least 2.0 for that term. The details given for each course in the

programme include the detailed assessment methods together with a description of the second mid-term exam.

Graduation Requirements

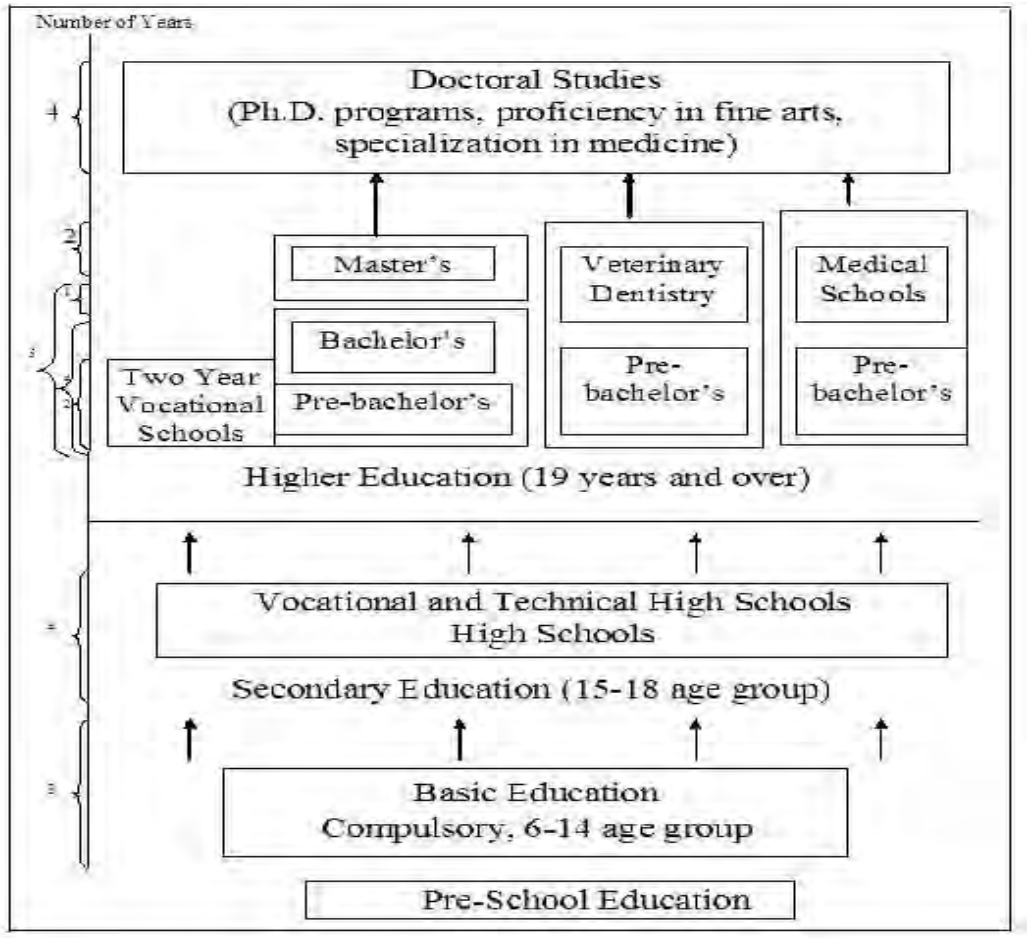
The graduation requirements for the Department of Maritime Transportation and Management Engineering are the same as the qualification requirements and regulations. There is no additional requirement to secure the Bachelor's Degree provided that the students have passed all the courses in the curriculum with at least a DC grade, had a cumulative gross point average of at least 2.00 out of 4.00, and completed the compulsory practical placement period of 365 days and had a passing grade for the reports prepared for these placements.

Occupational Profiles of Graduates

The graduates of the Department of Maritime Transportation and Management Engineering has many opportunities of employment in a varitey of state and private maritime companies. The students, which are graduated in our department, are taking place and working in port and agency management and on board.

Access to Further Studies

The student who have completed the department may apply to Master of Science in variety of fields in the department



3. STRUCTURE OF INSTITUTIONS

Karadeniz Technical University
Faculty of Marine Sciences

The Maritime Transportation and Management Engineering Department	Naval Architecture and Marine Engineering Department	Fisheries Technology Engineering Department
1. NAVIGATION AND SAFETY AT SEA SECTION 2. SHIP OPERATIONS SECTION	1. MARINE ENGINEERING SECTION 2. NAVAL ARCHITECTURE SECTION 3. MARINE HYDRODYNAMIC SECTION	1. FISHERIES MANAGEMENT SECTION 2. AQUACULTURE AND FISH DISEASES SECTION 3. MARINE ECOLOGY SECTION 4. SEAFOOD PROCESSING SECTION

4. TRAINING AND REASEARCH SHIP

R/V KTU DENAR I

R/V KTU DENAR-1 (length of 24,5 m) is used by the staff, graduate and undergraduate students for a variety of exercise and drill. Also, it is used by undergraduate students for ship handling and manoevering

Ship Particular
LOA : 24.5 metre
width : 6.50 metre
Draft : 2.70 metre
Cabins capasity
1 x 2 officers,
1 x 5 crew,
1 x 6 researcher
2 x 10 salon

Main Engines 1x 212 KW
Generator
1x 46 KW
Lights (for nigth work)
11 x 500 w
Boath

Zodiac MAK 2 Grand Raid 25 HP

Crain

10 m/ ton (10.60 m)

Windlass

80 KW

HydraulicWindlass

20 KW

Steal Wire

3000 metres

Radar

FRUNO Range 48 NM

JRC JMA 2244 Marine Radar

Sonar

SUZIKI S- 1600 m -15

Echosounder

JVC V-10

JRC JFV-850

VHF Radio

SAILOR RT144c

CB Radio

MOTOROLA AT-40

GPS

LORENZ Exgalabur Chart Ploter

MACELLAN NAV 5000 D

MACELLAN 300

Meteorology Station

DAVIS Waetherling 4.02

Plankton Nets

Hidrobios 300 mm Hensen tip

200 mm standart tip

Kalsico 75 mm clossing tip

20 mm standart tip

5 mm Makroplanktonik net

Samplink

Wan-dorn 9 l teflon

Nansen 1.7 l

Mikrobiological Samplink i 0.5 l

Prob

AANDERA RCM-9 (2000 metre)

YSI 3200 CTD (100 metre)

YSI 51 B oksygen metre

Current Meter

AANDREA Dopler Current meter

MARICO Model 2-233 S/N 970-3021

Bentik Samlinc Equipment

Grap : Kalsico orange peel (For Sediment)

Drage : 400 cm x 40 cm

Kirisli trol : 500 m x 1 m

Sediment trap : 2 x 50 cm

5. STRUCTURE OF MARITIME PROGRAMS

First Year					
Code	Course Title	ECTS	H+T+L	C/E	Lang.
First semester					
MAT 117	Mathematics - I	6	4+0+0	Compulsory	Turkish
FIZ 117	General Physics	5	4+0+0	Compulsory	Turkish
YDI 111	English - I	3	3+0+0	Compulsory	English
AITB191	History of Revolution and Ataturk's Princip.	2	2+0+0	Compulsory	Turkish
TDB 101	Turkish Language - I	2	2+0+0	Compulsory	Turkish
DUM 101	Maritime Chemistry	3	2+0+1	Compulsory	English
DUM 103	Physical Fitness	1	2+0+0	Compulsory	English
DUM 105	Seamanship - I	3	3+1+0	Compulsory	English
DUM 107	Navigation - I	3	3+1+0	Compulsory	English
DUM 109	Safety At Sea - I	2	2+1+0	Compulsory	Turkish
	First Semester Total :	30	27+3+1		
Second semester					
YDI 112	English - II	3	3+0+0	Compulsory	English
MAT 118	Mathematics - II	6	4+0+0	Compulsory	Turkish
AITB192	History of Revolution and Ataturk's Princip.	2	2+0+0	Compulsory	Turkish
TDB 102	Turkish Language - II	2	2+0+0	Compulsory	Turkish
DUM 102	Electric-Electronics	3	3+0+1	Compulsory	Turkish
DUM 104	Watchkeeping Standarts - I	3	3+0+0	Compulsory	Turkish
DUM 106	Seamanship - II	4	3+1+0	Compulsory	English
DUM 108	Navigation - II	3	3+1+0	Compulsory	English
DUM 112	Safety At Sea - II	2	2+1+0	Compulsory	Turkish
DUM 114	Physical Fitness and Swimming	2	2+1+0	Compulsory	English
	Second Semester Total :	30	27+4+1		
	YEAR TOTAL :	60			

Second Year					
Code	Course Title	ECTS	H+T+L	C/E	Lang.
First semester					
MAT 203	Mathematics - III	6	4+0+0	Compulsory	Turkish
DUM 201	Maritime English - I	3	3+0+0	Compulsory	English
DUM 203	Safety At Sea - III	2	1+1+0	Compulsory	English
DUM 205	First Aid and Medical Care	2	1+1+0	Compulsory	Turkish
DUM 207	Meteorology	2	2+0+0	Compulsory	Turkish
DUM 211	Ship Construction	2	3+0+0	Compulsory	English
DUM 213	Technical Drawing	3	2+1+0	Compulsory	English
DUM 215	Celestial Navigation - I	2	2+1+0	Compulsory	Turkish
MHN 257	Engineering Mechanics	4	4+0+0	Compulsory	Turkish
DUM 209	Statistics	2	2+0+0	Compulsory	Turkish
DUM 217	Introduction of Algorithm and Programming	2	2+0+0	Compulsory	Turkish
	First Semester Total :	30	26+4+0		
Second semester					
IKT 202	Economy	2	2+0+0	Compulsory	Turkish
MAT 204	Mathematics - IV	6	4+0+0	Compulsory	Turkish
DUM 202	Maritime English - II	3	3+0+0	Compulsory	English
DUM 204	Celestial Navigation - II	3	2+1+0	Compulsory	Turkish
DUM 206	Electronical Navigation - I	4	3+1+0	Compulsory	English
DUM 208	Ship Stability - I	4	3+1+0	Compulsory	English
DUM 214	Watchkeeping Standards - II	2	3+0+0	Compulsory	Turkish
DUM 216	Safety At Sea - IV	3	2+1+0	Compulsory	Turkish
DUM 218	Ship Maneuvering - I	3	2+1+0	Compulsory	Turkish
	Second Semester Total :	30	24+5+0		
	YEAR TOTAL :	60			

Third Year					
Code	Course Title	ECTS	H+T+L	C/E	Lang.
First semester					
DUM 301	Maritime English - III	2	3+0+0	Compulsory	Turkish
DUM 303	Cargo Handling	6	3+1+0	Compulsory	Turkish
DUM 305	Maritime Law - I	5	4+0+0	Compulsory	Turkish
DUM 307	Marine Communication	4	3+2+0	Compulsory	Turkish
DUM 309	Maritime Management	2	2+0+0	Compulsory	Turkish
DUM 311	Safety and Quality Management	5	3+0+0	Compulsory	Turkish
DUM 313	Port and Terminal Operations	3	2+0+0	Compulsory	Turkish
DUM 315	Ship Power Plant	2	2+0+0	Compulsory	Turkish
DUM 317	International Maritime Conventions - I	2	2+0+0	Compulsory	Turkish
	First Semester Total :	30	24+3+0		
Second semester					
DUM 302	Long Term Sea Training	30	8+40+0	Compulsory	English
	Second Semester Total :	30	8+40+0		
	YEAR TOTAL :	60			

Fourth Year					
Code	Course Title	ECTS	H+T+L	C/E	Lang.
First semester					
DUM 403	Watchkeeping Standards - III	3	2+1+0	Compulsory	Turkish
DUM 405	Chartering and Brokering	3	3+0+0	Compulsory	English
DUM 407	International Maritime Conventions - II	2	2+0+0	Compulsory	Turkish
DUM 409	Ship Management	4	2+1+0	Compulsory	English
DUM 411	Cargo Handling and Ship Stability	5	3+1+0	Compulsory	English
DUM 415	Meteorology and Oceanography	3	2+1+0	Compulsory	Turkish
DUM 417	Marine Control Systems and Automation	3	2+1+0	Compulsory	Turkish
DUM 419	Navigation - III	4	2+0+1	Compulsory	English
DUM 421	Safety At Sea V	3	2+1+0	Compulsory	Turkish
	First Semester Total	30	20+6+1		
Second semester					
TEZ 400	Graduation Project	8	0+6+0	Compulsory	Turkish
DUM 412	Maritime Insurance	2	2+0+0	Compulsory	Turkish
DUM 404	Logistic	2	2+0+0	Compulsory	Turkish
DUM 418	Operational Research	2	2+0+0	Compulsory	Turkish
DUM 416	Tanker Operations	3	3+0+0	Compulsory	Turkish
DUM 408	Marine Law - II	3	3+0+0	Compulsory	Turkish
DUM 414	Ship Maneuvering	3	2+1+0	Compulsory	Turkish
DUM 406	Electronical Navigation - II	4	3+1+0	Compulsory	English
DUM 422	Personnel Management	2	2+0+0	Compulsory	Turkish
DUM 402	Maritime English - IV	3	3+0+0	Compulsory	English
	Second Semester Total	30	22+8+0		
	YEAR TOTAL :	60			

FIRST YEAR FIRST SEMESTER

DUM 105	SEAMANSHIP - I	3+1+0	ECTS:3

Course Syllabus

Week	Subject
Week 1	Definition and history of seamanship, development of the modern seamanship,
Week 2	General terms of seamanship
Week 3	Terms of the parts of the ship, terms relevant to manoeuvring of the ship, terms relevant to position or direction
Week 4	Structures used as an aid to seamanship
Week 5	Tonnage, speed, distance measurements in seamanship
Week 6	Ship types and general classifications, boats, types of the boats, construction of the boat
Week 7	Parts of the boat, boats which made from wooden or synthetic materials
Week 8	Mid-term exam
Week 9	Techniques of the rowing
Week 10	Usage of the boats with engine
Week 11	Sailing boats.
Week 12	Sailing by boats on heavy seas, sailing boats and riggings.
Week 13	Midterm
Week 14	Sailing boat Berthing
Week 15	man overboard from sailing boat.
Week 16	End-of-term exam

MAT 117	MATHEMATICS - I	4+0+0	ECTS:6

Course Syllabus

Week	Subject
Week 1	Functions, inverse functions, plotting the graphs of basic curves, transformation of graphs.
Week 2	Trigonometric functions, inverse trigonometric functions, logarithmic and exponential functions.
Week 3	Limit, rules of limit, continuity.
Week 4	Derivative of function, geometric meaning of derivative, rules of derivative, derivative of trigonometric functions, inverse trigonometric functions, logarithmic and exponential functions
Week 5	Higher order derivative, chain rules, derivative of implicit functions, applications of derivative, concept of derivation.
Week 6	L'hospital rule, limit at infinity, Rolle Theorem and Mean Value Theorem, extrema of functions.
Week 7	Asymptotes, plotting graphs by observation of changes in functions
Week 8	Mid-term exam
Week 9	Indefinite integrals
Week 10	Methods of integration, change of variable, integration by parts, integration of polynomials, algebraic and trigonometric (rational) functions
Week 11	Riemann sums, definite integration and properties, fundamental theorem of analysis
Week 12	Change of variables for definite integrals. Short Exam.
Week 13	Applications of definite integrals: areas of regions, length of curves, volumes of rotating objects, surface arease, calculation of mass, moment, gravitational center and work.

Week 14	Generalization of integration
Week 15	Sequences, series, alternating series, power series, series expansion of functions (Taylor and Maclaurin series)
Week 16	End-of-term exam

FIZ 117	**GENERAL PHYSICS**	**4+0+0**	**ECTS:5**

Course Syllabus

Week	**Subject**
Week 1	Motion in one dimension, Problems
Week 2	Motion in two dimensions, Problems
Week 3	The laws of motion
Week 4	The laws of motion
Week 5	Circular motion, Problems
Week 6	Work and kinetic energy,
Week 7	Work and kinetic energy, Problems
Week 8	Mid-term exam
Week 9	Potential energy and conservation of energy, Problems
Week 10	Linear momentum and collisions, Problems
Week 11	Rotation of a rigid object
Week 12	Rotation of a rigid object, Problems
Week 13	Rolling motion and angular momentum, Problems
Week 14	Equilibrium and elasticity, Problems
Week 15	Final exam
Week 16	End-of-term exam

YDI 111	**ENGLISH – I**	**3+0+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	Work matters Tenses
Week 2	Education standards Tenses
Week 3	Vitamins Modals
Week 4	Advertising Modals
Week 5	Dynamites Passive Voice
Week 6	Land of immigrants Passive Voice
Week 7	Distribution of nutrients in plants Gerunds and Infinitives
Week 8	Mid-term exam
Week 9	The Explosion of St. Helens Gerunds and Infinitives
Week 10	The Science of Living Things Singular and Plural
Week 11	From Aristotle to DNA Singular and Plural
Week 12	Genetic Engineering Relative (Adjective) Clauses
Week 13	The Manipulation of Genetic Traits Relative(Adjective) Clauses
Week 14	Statistics, Probability and Population Noun Clauses

Week 15	Reading: Applying Science to Our Lives Grammar: Noun Clauses
Week 16	Final exam

AITB191	**HISTORY OF REVOLUTION AND ATATURK' S PRINCIP.**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	Subject
Week 1	Revolution and Revolutionary Concepts; State and its comporents, evolution, Reforms, upheaval. Govermental coup, revolution and insurrection
Week 2	The reasons causing Turkish Revolution, the collapse of Ottoman Empire, interior reasons. Exterior reasons
Week 3	The threats Ottoman Empire exposed due to its geopolitical situation. Renovotion movements in Ottoman Empire, evolutions before the Tanzimat
Week 4	The political reforms made in the Ottoman State. The First Constitutional Monarch., The Second Constitutional Monarch
Week 5	National Movements in the late years of the Ottoman Empire (Ottoman, Islam, Western and Turkish Reflections.) The rule of The Committee of Union and Progress, March 31 rebellion
Week 6	Tripoli War, Balkan Wars. The causes of World War I, the outset of the war
Week 7	The İnvolvement of the Ottoman Empire in the war. Fronts and their results
Week 8	Mid-term exam
Week 9	The treaties about the allocotion of the Ottoman Empire (The Bosphorus Treaty, Londen Treaty, Skyes Picot Treaty, St. Jean de Mourienne Treaty) The and of The World War I, Armenian incidents, Mondros Armistice
Week 10	National Struggle Period, the condition of the country in face of the occupations. Committees and their activities
Week 11	Ataturk's arrival in İstanbul and owerwiev the situation. Mustafa Kemal's lands Samsun, activities Havza and Amasya Announcement
Week 12	Erzurum Congress and itsimportance, Balıkesir and Alaşehir Congresses. The İmportance of the Sivas Congress and other Congresses during the National Struggle period
Week 13	Amasya Negotiations, the meeting held with the Commanders in Sivas, The arrival of representative Committce. The meeting of the last Ottoman members of Parliament the National Pact of 1920
Week 14	The opening of the Turkish Grand National Assembly. The Media in the national Struggle
Week 15	The rebellions against the Turkish Grand National Assembly. The plans of allocating Turkey
Week 16	End-of-term exam

TDB 101	**TURKISH LANGUAGE - I**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	Subject
Week 1	Language. (Language- nation relationship/ language- culture relationship)
Week 2	All Languages in the world. How basic Turkish Language is amongst other Languages.
Week 3	According to the language families in terms of basics For structure language groups.
Week 4	The historical periods of Turkish Language. The historical periods of Turkish written language.
Week 5	Old Turkish- Middle Turkish- New Turkish- Modern Turkish(up to date).

Week 6	Today's condition of Turkish Language and The areas of expansion.
Week 7	Phonetics.
Week 8	Mid-term exam
Week 9	Phonetics. Morphologie- suffix, affix, prefix, ending, termination.
Week 10	The words for meanings and functions.
Week 11	Semantic- semantic in word- inter-words relations.
Week 12	Syntax- The specialities of word groups.
Week 13	The kinds of word groups.
Week 14	Basics of a sentence.
Week 15	Kinds of sentence and Analyses of a sentence.
Week 16	End-of-term exam

DUM 101	**MARITIME CHEMISTRY**	**2+0+1**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Basic concepts of chemistry.		
Week 2	Soltions,solution preparition.		
Week 3	Physical and chemical properties of sea water.		
Week 4	MARPOL, structure and classification of pollutants, organic pollution.		
Week 5	Thermal pollution and surfactant pollution.		
Week 6	Metal pollution and pesticides.		
Week 7	Oil pollution.		
Week 8	Mid-term exam		
Week 9	Ship-source pollutants.		
Week 10	Marine pollution caused by shipyards and dismantling.		
Week 11	Definition and classification of corrosion.		
Week 12	Second midterm exam, Corrosion on boats and the fight against corrosion.		
Week 13	Fuels and oils.		
Week 14	Ship paints.		
Week 15	Painting of ships		
Week 16	End-of-term exam		

DUM 103	**PHYSICAL FITNESS**	**2+0+0**	**ECTS:1**
Course Syllabus			
Week	**Subject**		
Week 1	Exercise of sport activities for physical fitness.		
Week 2	Exercise of sport activities for physical fitness.		
Week 3	Exercise of sport activities for physical fitness.		
Week 4	Exercise of sport activities for physical fitness.		
Week 5	Exercise of sport activities for physical fitness.		
Week 6	Improve physical fitness programs, to apply physical-conditioning programs for suited sea-going life.		
Week 7	Improve physical fitness programs, to apply physical-conditioning programs for suited sea-going life.		

Week 8	Mid-term exam
Week 9	Earn physical competence for ship and small spaces.
Week 10	important of leadership's functions.
Week 11	important of leadership's functions
Week 13	consuetudes of marine
Week 14	consuetudes of marine
Week 15	consuetudes of marine
Week 16	End-of-term exam

DUM 107	**NAVIGATION - I**	**3+1+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	Definition and history of navigation, development of nautical instruments.
Week 2	The earth's shape, latitudes, longitudes, differance of latitudes and longitudes.
Week 3	Definition of distance and direction at sea. Tools and materials used in the navigation.
Week 4	Compass and compass use.
Week 5	Chart projections, specifications of the marine navigation charts.
Week 6	Chart catalogues and usage.
Week 7	Drawing a small area mercator chart, comparing the mercator projection with other kind of projections.
Week 8	Mid-term exam
Week 9	The use of symbols and abbreviations books and use of notice to mariners.
Week 10	Chart corrections.
Week 11	Nautical publications and specifications.
Week 12	Short exam, Lights and fog signals, light characteristics and specifications.
Week 13	Using of lighthouse books, lighthouse in the distance appear, belonging to abbreviations of lighthouse.
Week 14	Fog signs, buoyage systems, introduction to system A and B symbols of the buoys on the charts.
Week 15	Showing lateral and cardinal signs on map.
Week 16	End-of-term exam

DUM 109	**SAFETY AT SEA - I**	**2+1+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Basic First Aid. Usage of equipment in emergency response box and other suitable material can take the place of bandages.
Week 2	Carry out techniques of revival. Personal safety and social responbility, technics of safe working.
Week 3	Personal life saving techniques at sea. Personal life saving equipment, locations and usage of these equipment.
Week 4	Equipment in life saving crafts and rescue boats. Personal protective clothes and equipment.
Week 5	What to do in case of abandoning ship. Personal survival at sea. What to do in survival craft. The main danger for the victims.
Week 6	Competency for lifesaving crafts. Equipment and structure of lifesaving craft and rescue

	boats.
Week 7	Lowering and lifting gears for various type of lifesaving craft and rescue boats. Lowering methods of lifesaving craft and rescue boats on heavy weather. What to do after abandoning ship. Running of lifesaving craft's engine.
Week 8	Mid-term exam
Week 9	Basic training for prevention of fire and fire fighting. Properties of flammable materials. Fire classes.
Week 10	Portable fire extinguishers. Fixed fire extinguishing installations. Personal fire equipment. Presentation and use of breathing devices.
Week 11	On board fire fighting organization. Fire-fighting, and victim rescue methods.
Week 12	Assessment of works within the semester and elimination of deficiency in the lesson.
Week 13	Effective human relationships on board. Emergency applications.
Week 14	Measures related to protection of the marine environment.
Week 15	General review of the topics discussed throughout the semester. Course completion and excuses week.
Week 16	End-of-term exam

FIRST YEAR SECOND SEMESTER

YDI 112	**ENGLISH - II**	**3+0+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Education and Life; Description, using context clues, suffix -wide		
Week 2	City Life; Expositon, using context clues, skimming for main ideas		
Week 3	Business and money; words with similar meaning, contrast		
Week 4	Jobs and professions; adjective and noun phrases; participles as adjectives		
Week 5	Lifestyles around the world; dictionary entries, understanding idioms		
Week 6	Global Connections; understanding outlines, making inferences		
Week 7	Langugage and Communication; distinguishing facts from from theories, categorizing		
Week 8	Mid-term exam		
Week 9	Tastes and preferences; incresing reading speed, predicting reading content		
Week 10	New Frontiers; prefixes and suffixes, summarizing		
Week 11	Medicine, Myths and Magic; scanning for information, getting meaning from context		
Week 12	The Media; using context clues, writing topic sentece		
Week 13	With Liberty and Justice for all; finding important details		
Week 14	Language and Learning; essay analysis, identifying exact words		
Week 15	Sex and Gender; using context and structure clues, paraphrasing theme or main idea		
Week 16	Final exam		
MAT 118	**MATHEMATICS - II**	**4+0+0**	**ECTS:4**
Course Syllabus			
Week	**Subject**		
Week 1	Matrices, determinants, eigenvalues and eigenvectors, inverse matrix.		
Week 2	Systems of lineer equations and solutions by reduction to echelon form and Crammer rule		
Week 3	Conic sections and quadratic equations, polar coordinates and plotting graphs, parameterization of curves on plane.		

Week 4	Three dimensional space and Cartesian coordinates. Vectors on the plane and space. Dot, cross and scalar triple product.
Week 5	Lines and planes on three dimensional space. Cylinders, conics and sphere. Cylindrical and spherical coordinates.
Week 6	Vector valued functions, and curves on the space, curvature, torsion and TNB frame.
Week 7	Multi variable functions, limit, continuity and partial derivative.
Week 8	Mid-term exam
Week 9	Chain rule, directional derivative, gradient, divergence, rotational and tangent planes.
Week 10	Ekstremum values and saddle points, Lagrange multipliers, Taylor and Maclaurin series.
Week 11	Double integration, areas, moment and gravitational center. Double integrals in polar coordinates. Triple integrals in cartesian coordinates.
Week 12	Mass, moment and gravitational center in three dimensional space. Triple integrals in cylindrical and spherical coordinates. Change of variables in multiple integrals.
Week 13	Line integrals, vector fields, work, flux. Green?s theorem on plane.
Week 14	Areas of surface and surface integrals.
Week 15	Stokes theorem, divergence theorem and applications.
Week 16	End-of-term exam

AITB192	**HISTORY OF REVOLUTION AND ATATURK' S PRINCIP.**	**2+0+0**	**ECTS:2**
Course Syllabus			
Week	**Subject**		
Week 1	The foundation of the National Army (The Nationalist Forces, Systematic Army) The Southern and Southeastern Fronts		
Week 2	The Eastern Front (The Turkish Grand National Assemby-Soviet Russia Relations Armenian Problem. The wars against the Armenians, TGNA-Georgia Relations		
Week 3	The Western Front,(The First and Second Inönü Wars, Kütahya-Eskişehir Wars,) Sakarya Battle, Grand Attack.		
Week 4	Social, Financial and weaponry Sources of National Struggle. Mudanya Ceasefire, The abolishment of the Sultanate.		
Week 5	Lausanne Conference. Lausanne Peace, the in auguration of the second Turkish Grand National Assembly.		
Week 6	Turkish Revolutionary Movements. The First Political Parties of the Republican Period, İzmir Assassination, Menemen Incident.		
Week 7	Legal Revalution. Educational and Cultural Revolution (Education during the republic)		
Week 8	Mid-term exam		
Week 9	Revolution, the studies in the fields of History, language and fine arts. The revolutions in the field of social life.		
Week 10	The Regulations in economic field. The studies of forming National Economy.		
Week 11	The Foreign Policy of Turkish Republic during Atatürk Period. 1923-1932 Foreign Policy Events.		
Week 12	1932-1939 Foreign Policy Events. The features of Foreign Policy during Atatürk period.		
Week 13	The Second World War-Turkey. The outcomes of World War-II.		
Week 14	The principles of Atatürk (Republicanism, Nationalism) Populism, Secularism.		
Week 15	Statism, Revolutionism. The complementary principles of Atatürk.		

Week 16	End-of-term exam		
TDB 102	**TURKISH LANGUAGE - II**	**2+0+0**	**ECTS:2**
Course Syllabus			

Week	Subject
Week 1	marks of punctution. (point, comma, semicolon, double point, interjection)
Week 2	marks of punctution. (inverted commas, paranthesis)
Week 3	The rules of orthography. (Writing of capitals and numbers and compounds)
Week 4	The rules of orthography. (writing of idioms, dieresis, quotation words and foreign proper nouns)
Week 5	The rules of orthography. (The writing of abbreviation and some additions.)
Week 6	composition. (definition, aim, being succesful in composition)
Week 7	The methods of composition. (The constitutetion of assistant reflection and main reflection.)
Week 8	Mid-term exam
Week 9	The methods of composition. (The constitutetion of paragraph, the methods of progress of reflection in paragraph)
Week 10	The properties of expression.
Week 11	Failure to expression properly.
Week 12	The forms of expression. (collecting homeworks)
Week 13	varieties of expression. (oral expression)
Week 14	varieties of expression. (written expression- letter, petition)
Week 15	varieties of expression.(written expression- story, fiction, theatre, verse)
Week 16	End-of-term exam

DUM 102	**ELECTRIC-ELECTRONICS**	**3+0+1**	**ECTS:3**
Course Syllabus			

Week	Subject
Week 1	Introduction to Matter, Energy and Direct Current, introduces the course with a short history of electricity and electronics and proceeds into the characteristics of matter, energy and direct current (DC). It also describes some of the general safety precautions and first-aid procedures that should be common knowledge for a person working in the field of electricity.
Week 2	Introduction to Alternating Current and Transformers, is an introduction to alternating current (AC) and transformers, including basic AC theory and fundamentals of electromagnetism, inductance, capacitance, impedance and transformers.
Week 3	Introduction to Electrical Conductors, Wiring Techniques and Schematic Reading, presents conductor usage, insulation used as wire covering, splicing, termination of wiring, soldering and reading electrical wiring diagrams.
Week 4	Introduction to Generators and Motors, is an introduction to generators and motors and covers the uses of AC and DC generators and motors in the conversion of electrical and mechanical energies.
Week 5	Introduction to Electronic Emission, Tubes and Power Supplies, Introduction to Solid-State Devices
Week 6	Introduction to Amplifiers and Wave-Generation
Week 7	Introduction to Wave Propagation, Transmission Lines and Antennas, presents the characteristics of wave propagation, transmission lines and antennas
Week 8	Mid-term exam
Week 9	Microwave Principles, explains microwave oscillators, amplifiers and

	waveguides.Modulation Principles, discusses the principles of modulation.
Week 10	Introduction to Number Systems and Logic Circuits, presents the fundamental concepts of number systems, Boolean algebra and logic circuits, all of which pertain to digital computers.
Week 11	Principles of Synchros, Servos and Gyros, provides the basic principles, operations, functions, and applications of synchro, servo and gyro mechanisms.
Week 12	Short exam. Introduction to Test Equipment, is an introduction to some of the more commonly used test equipments and their applications.
Week 13	Radio-Frequency Communications Principles, presents the fundamentals of a radio frequency communications system.
Week 14	Radar Principles, covers the fundamentals of a radar system.
Week 15	Introduction to Fiber Optics, is an introduction to fiber optics.
Week 16	End-of-term exam

DUM 104	**WATCHKEEPING STANDARTS - I**	**3+0+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Enter to Rules of Prevention Collision and Application		
Week 2	Traffic separation schemes,Responsibilites, Narrow channels		
Week 3	Power-driven vessels under way, Look-out, Use of electronic navigation devices		
Week 4	Safe speed,Safe Distance, Risk of collision		
Week 5	Action by give-way vessel, Action by stand-on vessel,Enter and exit to traffic seperation schemes		
Week 6	Navigation Lights.		
Week 7	Action to avoid collision		
Week 8	Mid-term exam		
Week 9	Crossing situation.		
Week 10	Overtaking vessel, Head-on situation vessels.		
Week 11	Shapes and technical details		
Week 12	Short exam, Grounded vessels,Anchored vessels.		
Week 13	Light and sound signals, Distress Signals		
Week 14	Fishing vessells,Vessels not under command or restricted in their ability to manoeuvre.		
Week 15	Navigation in Restrictred Visibility		
Week 16	End-of-term exam		

DUM 106	**SEAMANSHIP - II**	**3+1+0**	**ECTS:4**
Course Syllabus			
Week	**Subject**		
Week 1	Rope and different kind of ropes, specifications and dimension measurements of the ropes the fibre, synthetic and wire cordages and breaking strength		
Week 2	Protection parts of and usage of the ropes, preparation before use, terms and commands for the handling of the ropes, seamanship works with the ropes, description of the seaman knots and how to make, whippings, fibre and wire cordage splicing,		
Week 3	Ships construction and parts of the ship, keel, floors, frames and beams		
Week 4	Decks, bulkheads, double-bottom tanks		
Week 5	Top-side and wing tanks		
Week 6	Hatch, hatch covers, open-close riggings of the hatch covers		

Week 7	Bilges and bilge lines
Week 8	Mid-term exam
Week 9	Ballast lines and pumps
Week 10	Fuel oil, cofferdam and slop tanks,
Week 11	Tank structures of tankers.
Week 12	Ship visit on port
Week 13	Rudder riggings
Week 14	rudder control
Week 15	Shipyard visit
Week 16	End-of-term exam

DUM 108	**NAVIGATION - II**	**3+1+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	Introduction to sailings, plane sailings, traverse sailing, parallel sailing, middle latitude sailing.
Week 2	Solution of plane and mercator sailing problems.
Week 3	Definition of course and bearing, true and relative bearings and transformations.
Week 4	History of the magnetic compass and parts of magnetic compass.
Week 5	Definition of variation and deviation.
Week 6	Finding the true course by application the variation and deviation to the compass course or finding the compass course.
Week 7	Preparing the deviation table.
Week 8	Mid-term exam
Week 9	Magnetic compass corrections.
Week 10	Definition of gyro compass and its gyroscopical principles.
Week 11	Finding the gyro compass error.
Week 12	Short exam, Description of all nautical instruments and aids in bridge.
Week 13	Definition of dead reckoning sailing and DR,EP,FIX positions
Week 14	The ways of plotting fix position in coastal navigation, using the radar as an navigational aid in coastal navigation.
Week 15	Using the nautical publications and charts.
Week 16	End-of-term exam

DUM 112	**SAFETY AT SEA - II**	**2+1+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Overall presentation of the SOLAS Convention-1974, parts, additional information and rules.
Week 2	Life saving equipment, life boats,life rafts, davits.
Week 3	Required equipment in life saving vehicles.
Week 4	Maintenance of lifesaving vehicles.
Week 5	Abandon ship, rescue man from the sea.
Week 6	Life in water and hypothermia, life in lifesaving crafts.
Week 7	Search-rescue and aid. Rescue and aid organizations.

Week 8	Mid-term exam
Week 9	Control of ships in terms of life saving equipments, life saving certificate of vehicles.
Week 10	Fire prevention and basic fire fighting training.
Week 11	Properties of flammable materials. Fire classes. Portable fire extinguishers.
Week 12	Fixed fire extinguishing installations. Courses within the evaluation of student assignments. Elimination of deficiencies.
Week 13	Personal fire equipment. Presentation and use of breathing devices.
Week 14	On board fire fighting organization.
Week 15	Fire-fighting, and victim rescue methods.
Week 16	End-of-term exam

DUM 114	**PHYSICAL FITNESS AND SWIMMING**	**2+1+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Introduction to history and benefits of swimming activity
Week 2	Physilogical effects of swimming activity on human body
Week 3	Rules that must be followed in swimming
Week 4	Improving swimming activity and techniques
Week 5	Nutrition and diet in swimming
Week 6	Training, cramp types, causes and treatment
Week 7	Standing positions on water surface
Week 8	Mid-term exam
Week 9	Crawl, butterfly stroke, breast stroke, side stroke
Week 10	Jumping and diving techniques
Week 11	Life saving methods
Week 12	homework, swimmming practise
Week 13	Introduction to first aid and drowning
Week 14	Hipotermia and water related injuries
Week 15	swimming practise
Week 16	End-of-term exam

SECOND YEAR FIRST SEMESTER

MAT 203	**MATHEMATICS - III**	**4+0+0**	**ECTS:4**

Course Syllabus

Week	**Subject**
Week 1	Differential equations and basic concepts. Differential equations as mathematical model (Ordinary differential equations, order and degree of differential equations. Derivation of differential equations.)
Week 2	General, particular and singular solutions of the differential equations. Existence and uniqueness theorems. Direction fields and solution curves.
Week 3	Separable, homogenous, exact differential equations and transforming to exact differential equation by using integrating factor.
Week 4	Linear differential equations, Bernoulli differential equation and applications of the first order differential equations(Population model, acceleration-velocity model, temperature problems)
Week 5	Change of variables. Reducible differential equations (single variable and non-linear differential equations)

Week 6	General solution of nth order linear differential equations (linearly independent solutions, super position principle for the homogeneous equations, particular and general solutions). General solution of nth order constant coefficient homogenous differential equations
Week 7	Solutions of the constant coefficient non-homogenous equations. (Undetermined coefficients, change of parameters)
Week 8	Mid-term exam
Week 9	Initial Value Problems (IVP) and Boundary Value Problems (BVP) (Eigenvalues and eigenfunctions for boundary value problems. Physical applications, mechanical vibrations, electrical circuits)
Week 10	Variable coefficient homogenous and non-homogenous differential equations (Cauchy-Euler, Legendre differential equations). Reduction of order.
Week 11	Power series solutions of differential equations around ordinary points.
Week 12	Laplace and inverse Laplace transformations. Short Exam.
Week 13	Solutions of constant and variable coefficient boundary value problems and differential equations containing Dirac-Delta function and transformation functions by using Laplace transformations.
Week 14	System of differential equations. Transformation of higher order differential equation to the system of first order differential equations. Solutions of the homogenous differential equations using eigenvalues and eigenvectors. Solutions of non-homogeneous constant coefficient system of differential equations.
Week 15	Application of the Laplace transformation to system of differential equations. Numerical solutions of differential equations (Euler and Runge-Kutta methods)
Week 16	End-of-term exam

DUM 201	**MARITIME ENGLISH - I**	**3+0+0**	**ECTS:3**

Course Syllabus	
Week	**Subject**
Week 1	Defination of a ship, ship types and ship plans
Week 2	Basic holding plan, draft and cross sections
Week 3	A modern port facilities, plan and terms
Week 4	Loading, unloading and cargo handling
Week 5	Preperation for port abording and clearance
Week 6	Some basic radio VHF communication regarding position and introduction
Week 7	English of equipment used on a bridge
Week 8	Mid-term exam
Week 9	Machinery room and its sections
Week 10	Navigation lights, buoys and marks
Week 11	Approaching and transpassing communication in fairways
Week 12	homework, Approaching and transpassing communication in fairways
Week 13	Some basic VHF calls
Week 14	Some terms related to cargo and cargo space
Week 16	End-of-term exam

DUM 203	**SAFETY AT SEA - III**	**1+1+0**	**ECTS:2**

Course Syllabus	
Week	**Subject**
Week 1	Emergency planning regulations.

Week 2	In an emergency, the ship, passengers, cargo and personnel protection measures.
Week 3	Ship beach methods
Week 4	Work to be done in the ship aground and measures to be taken.
Week 5	Collision and the measures to be taken in collision.
Week 6	Protect passengers in case of emergency and recovery.
Week 7	Towing and pushing methods of the vessel damaged after fire or explosion.
Week 8	Mid-term exam
Week 9	Methods of abandon ships.
Week 10	Information about usage of emergency steering gear.
Week 11	Towing and towing methods.
Week 12	Assistance to ships in danger. Courses within the evaluation of student assignments and eliminate deficiencies.
Week 13	Procedures to be applied in the man falling into the sea, Search and rescue techniques.
Week 14	Cases occurring in the port emergency measures to be taken.
Week 15	Infections and diseases, first aid at sea, bleeding, fractures, burns, loss of consciousness, poisoning, balanced nutrition, hygiene, family planning.
Week 16	End-of-term exam

DUM 205	**FIRST AID AND MEDICAL CARE**	**1+1+0**	**ECTS:2**
Course Syllabus			
Week	**Subject**		
Week 1	Apply immediate first aid in the event of accident or illness on board, provide		
Week 2	medical care to the sick and injured while they remain on board,		
Week 3	radio medical advise		
Week 4	First aid techniques		
Week 5	First aid techniques into practise		
Week 6	Poisoning, bites and stings		
Week 7	transportation of the ill and injured including helicopter evacuation,		
Week 8	Mid-term exam		
Week 9	medical care of sick seafarers involving co-operation with port health authorities or out-patient wards in port		
Week 10	Medical care		
Week 11	Tobacco, alchol and drug use		
Week 12	Infectious diseases, crew health		
Week 13	Death at sea, International Healty Regulations		
Week 14	Environmental control and		
Week 15	hygine		
Week 16	End-of-term exam		

DUM 207	**METEOROLOGY**	**2+0+0**	**ECTS:2**
Course Syllabus			
Week	**Subject**		
Week 1	Structure of Atmosphere		
Week 2	Energy and energy transfer and distribution		
Week 3	Atmospheric presure and density		
Week 4	Atmospheric moisture and water distribution in atmosphere		

Week 5	Atmospheric air flows and winds
Week 6	Air masses, fronts and extreme weather conditons
Week 7	Global weather events and weather conditions
Week 8	Mid-term exam
Week 9	Study on meteorological reports and maps
Week 10	Planning of maritime operations by meteorological stuation
Week 11	Planning of maritime operations by meteorological stuation
Week 12	Student presentation
Week 13	Student presentation
Week 14	Student presentation
Week 15	Student presentation
Week 16	End-of-term exam

DUM 211	**SHIP CONSTRUCTION**	**3+0+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Introduction
Week 2	The Hull and its Elements, factors affecting structural desing of hull and its elements
Week 3	Framing systems, hull materials and welding
Week 4	Construction to rules of classification societies
Week 5	Details of ship construction
Week 6	Types of ships, framing to ship types
Week 7	Structural design of dry cargo ships
Week 8	Mid-term exam
Week 9	Structural design of oil tanker, ore-oil carriers, liquefied gas carriers
Week 10	Structural design of ore carrier, universal bulk carriers.
Week 11	Structural design container ships. Structural design ro-ro ships, passenger ships, fishing ship
Week 12	2nd examination
Week 13	The hull constructions made of non-ferrous materials, fibreglass, wood, aluminium and ferrocements.
Week 14	The hull outfit and fitting, cargo handling systems.
Week 15	The hull outfit and fitting, cargo handling systems.
Week 16	End-of-term exam

DUM 213	**TECHNICAL DRAWING**	**2+1+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	The introduction of tools and materials in engineering drawing and standard concept
Week 2	Introduction to drawing instruments
Week 3	Line drawing and writing standarts
Week 4	Geometrical constructions
Week 5	Projection
Week 6	Views of objects

Week 7	Views of objects
Week 8	Mid-term exam
Week 9	Principles of dimensioning
Week 10	Principles of dimensioning
Week 11	Sectional views
Week 12	Sectional views
Week 13	Perspective drawing and reading
Week 14	Perspective drawing and reading
Week 15	Exercise ship drawing examples
Week 16	End-of-term exam

DUM 215	**CELESTIAL NAVIGATION - I**	**2+1+0**	**ECTS:2**

Course Syllabus	
Week	**Subject**
Week 1	Introduction of solar system and celestial navigation.
Week 2	Earth's orbit and seasons, tropics, earth's rotation, reasons for changing the duration of the day light.
Week 3	Celestial sphere and coordinate system. North and South celestial poles. Observer's meridian and latitude.
Week 4	Definitions of Colat, Codec and Polar Distance.
Week 5	Definitions of Aries, Libra, Aries hour angle and hour angle.
Week 6	Definitions of altitude circle, vertical circle and prime vertical circle.
Week 7	Definitions of Altitude, Coalt, Zenith, Nadir.
Week 8	Mid-term exam
Week 9	Definitions of Celestial horizon and Celestial ecuador.
Week 10	Zenith Distance, difference between Azimuth and true bearing, measurement of azimuth and conversion to true bearing.
Week 11	Definition of horizon and types.
Week 12	Short exam, Concepts of hour angle, definition of hour angle and types. Definition of SHA, GHA and LHA.
Week 13	Short exam, Calculation of SHA, GHA and LHA using notic almanac.
Week 14	Different kinds of times, time zones and time equation.
Week 15	Calculation of twilight, sunrise and sunset time.
Week 16	End-of-term exam

MHN 257	**ENGINEERING MECHANICS**	**4+0+0**	**ECTS:4**

Course Syllabus	
Week	**Subject**
Week 1	Basic concepts, units of measurement
Week 2	Force vectors
Week 3	Position vectors
Week 4	Planar force systems
Week 5	Three-dimensional force systems
Week 6	Resultant of force systems
Week 7	Rigid body equilibrium
Week 8	Mid-term exam
Week 9	Structural analysis

Week 10	Internal forces
Week 11	Center of gravity
Week 12	II. Mid-term week
Week 13	Moments of inertia
Week 14	Friction
Week 15	Friction
Week 16	End-of-term exam

DUM 209	**STATISTICS**	**2+0+0**	**ECTS:2**
Course Syllabus			
Week	**Subject**		
Week 1	İntroduction to statistics, terms and definitions, population and sample, sample size and sampling methods, dicrete and continuous variables, tables and graphs.		
Week 2	Raw data,arrays, frquency distributions, class intervals and class limits, class boundaries, the size of class intervals, class mark, general rules for forming frquency distributions, histograms and frequency polygons, relative and cumulative frequency distributions.		
Week 3	Measure of central tendency, arithmetic mean, weighed arithmetic mean, median, mode, empirical relation between mean median and mode, geometric mean, harmonic mean, properties of different measures.		
Week 4	Measures of dispersion, range, mean deviation, variation, standart deviation, coefficient of variation, properties of variance, Sheppard's correction for variance.		
Week 5	Elemantary probability theory, classical and statistical definition, probability theorems, independent and dependent ivents, conditional probability, probability distributions, mathematical expectation, factoriel n, permutations, combinations		
Week 6	Classical populations, normal distributions, binomial distributions, poisson distributions.		
Week 7	Relationship between variables, definitions, regresion lines and coefficients, estimation, correaltion coefficient, lineer and non-lineer relationships, computation, least square method.		
Week 8	Mid-term exam		
Week 9	Sampling distributions, definitions, distribution of means, distribution of difference of means, distribution of proportions.		
Week 10	Standart error, standart eror of mean, difference of means, correlation and regression coefficients.		
Week 11	test distributions, Z, t, Chi-square, F distributions, estimation of parameters, confidence intervals.		
Week 12	2nd Examination		
Week 13	Hypothesis testing, Type I and Type II errors, significance levels, Z, Student's t, chi-square tests and tables.		
Week 14	Analysis of variance, mathematical model and analyse, means of squares, F test, computations evaluation of analyse, determination of different groups, least significance, Duncan method.		
Week 15	Compensation week and make up examination		
Week 16	End-of-term exam		

SECOND YEAR FIRST SEMESTER

IKT 202	ECONOMY	2+0+0	ECTS:2

Course Syllabus

Week	Subject
Week 1	Economic issues,basic economic concepts and economic systems
Week 2	Price mechanism.
Week 3	Consumer balance,Production theory
Week 4	Complete and incomplete markets firms compete and market equilibrium
Week 5	Distribution theory
Week 6	National income and employment
Week 7	Analysis of the factors which determine national income
Week 8	Mid-term exam
Week 9	Multiplier,accelerated
Week 10	State and national income
Week 11	In an open economy national income
Week 12	Exam, Monetary theory
Week 13	Monetary theory
Week 14	International economic relations
Week 15	Economic growth
Week 16	End-of-term exam

MAT 204	MATHEMATICS - IV	4+0+0	ECTS:4

Course Syllabus

Week	Subject
Week 1	Fourier series and convergence of general Fourier series.
Week 2	Fourier sinus and cosinus series, solution of differential equations with Fourier series.
Week 3	Introduction to first and second order partial differential equations.
Week 4	Solutions of heat and wave equation using separation of variables and Laplace transformation.
Week 5	Sturm-Liouville problems and eigenfunction expansions.
Week 6	Introduction to complex numbers and properties.
Week 7	Concept of complex functions.
Week 8	Mid-term exam
Week 9	Conformal mapping.
Week 10	Limit, continuity and derivative in complex functions.
Week 11	Concept of analytical and harmonic functions.
Week 12	Integration of complex functions.
Week 13	Cauchy integration theorems and applications.
Week 14	Cauchy derivative theorems and applications.
Week 15	Taylor and Laurent series. Residue Theorem and application to calculation of real integrals.
Week 16	End-of-term exam

DUM 202	MARITIME ENGLISH - II	3+0+0	ECTS:3

Course Syllabus

Week	Subject
Week 1	Weather reporting during navigation
Week 2	Emergency calls
Week 3	Changing the watch keeper
Week 4	Port operations
Week 5	Port state control and communication
Week 6	Navigating in dangerous zones
Week 7	Survival in case of emergency
Week 8	Mid-term exam
Week 9	Anchor and anchoring
Week 10	Pilotage
Week 11	VTS communications
Week 12	homework, practising some basic communications
Week 13	Standart wheel orders
Week 14	Standart machinery orders
Week 15	practise of communications in emergency
Week 16	End-of-term exam

DUM 204	CELESTIAL NAVIGATION - II	2+1+0	ECTS:3

Course Syllabus

Week	Subject
Week 1	Optical principles of sextant.
Week 2	Usage of sextant, sextant errors.
Week 3	Corrections of sextant errors, index error and finding the index error.
Week 4	Corrections to be applied sextant altitudes.
Week 5	Solutions of sextant altitude problems.
Week 6	Solutions of sextant altitude problems.
Week 7	Finding the time of meridian passages of the sun, moon and planets.
Week 8	Mid-term exam
Week 9	Finding the latitude and longitude by meridian passage of the sun.
Week 10	Usage of the star identification.
Week 11	Finding the latitude by polaris observation.
Week 12	Short exam, Calculation of the position lines sun and moon by using calculator-logarithms and pre-calculated tables.
Week 13	Calculation of the position lines planet and star by using calculator-logarithms and pre-calculated tables.
Week 14	Finding the compass error by astronomical observations.
Week 15	Life boat navigation with celestial navigation technics.
Week 16	End-of-term exam

DUM 206	ELECTRONICAL NAVIGATION - I	3+1+0	ECTS:4

Course Syllabus

Week	Subject
Week 1	The Gyro Compass; Fundamental principles of a free gyroscope, The apparent movement of the free gyroscope, The Ballistic elements, How a free gyroscope can be made a gyro compass, The compass errors, compass correction.
Week 2	The starting of the gyro compass, The repeater system of master gyro-compass, The use

	of gyro input to navigation equipment, The alarms fitted to a gyro-compass, The main types of gyro compass in use at sea, The maintenance of gyro compass.
Week 3	Echo-Sounders; The physical factors which affect the sound in water, The basic principles of marine echo-sounders, The block diagram of an echo-sounder, Recorders and echo-meters of an echo sounders, The controls of an echo sounder, The operation of an echo sounder.
Week 4	False echoes, instrument and scale errors, Draught and trim corrections, Basic user maintenance and change paper.
Week 5	Speed logs; Types of speed using in navigation, The electromagnetic speed logs, The propeller type of speed logs, The pressure type of speed log, The basic theory of Doppler event, The operational principles of the Doppler Speed log.
Week 6	The controls of acoustic logs, Measure speed in deep sea by using an acoustic log, The main errors on the logs, accuracies, corrections, The types of log Indicators, How log input is supplied to navigation equipments.
Week 7	Global Positioning System (GPS); The basic principles of GPS, The main parts of the GPS (satellites, LES, receivers), The frequencies that are use, GPS codes, The principles of obtaining a fix in GPS.
Week 8	Mid-term exam
Week 9	The accuracy of a GPS fix, The types of GPS receiver in use at sea, The principles of operation of DGPS, The principles of operation of SATNAV, The difference between GPS and SATNAV.
Week 10	Hyperbolic Navigation System; The principles of Hyperbolic Fixing Systems, Hyperbolic position lines.
Week 11	Electronical Charts; The characteristics of ECDIS, International Standards for ECDIS, The operational functions of ECDIS and databases.
Week 12	Short exam, Use of ECDIS with Radar, The planning of navigation using ECDIS.
Week 13	Automatic Identification System (AIS); The components of AIS, AIS transponders.
Week 14	Dynamic and static data transmission in AIS, Regulations and dates of implementation.
Week 15	Voyage Data Recorders (VDR); The purpose of using VDRs, The operational principles of VDRs, The information can be recorded by VDRs The use of information which are recorded by VDR, Regulations and dates of implementation.
Week 16	End-of-term exam

DUM 208	**SHIP STABILITY**	**3+1+0**	**ECTS:4**

Course Syllabus

Week	**Subject**
Week 1	Ship dimensions, coefficients of form
Week 2	Forces and moments
Week 3	Center of gravity
Week 4	Density and specific gravity
Week 5	Laws of flotation
Week 6	Transverse stability
Week 7	Righting lever GZ, center of gravity
Week 8	Mid-term exam
Week 9	Metacentric heights, stiff and tender ships
Week 10	Statical stability diagram, stability cross curves
Week 11	Inclining experiment, grain cargo and its heeling moments
Week 12	Bonjean curves

Week 13	Quiz
Week 14	Longitudinal stability, trim
Week 15	Trim calculations
Week 16	End-of-term exam

DUM 214	WATCHKEEPING STANDARDS - II	3+0+0	ECTS:2

Course Syllabus

Week	Subject
Week 1	Responsibility of the officer in charge of a navigational watch with regard to avoiding collision and stranding.
Week 2	Principles of watch keeping, use and control of navigational equipment
Week 3	Principles of handing over and taking over watch
Week 4	Navigation with pilot
Week 5	Look-out, Use of radar
Week 6	Coastal navigation
Week 7	Navigation in poor visibility
Week 8	Mid-term exam
Week 9	Organizing watchkeeping personnel.
Week 10	Keeping watch while at anchor and principles.
Week 11	Calling the master situations.
Week 12	Short exam. Keeping watch in port, handing over watch in port, bad weather in the port
Week 13	Review of COLREG/72 rules.
Week 14	Review of COLREG/72 rules.
Week 15	Prevention of pollution and MARPOL 73/78.
Week 16	End-of-term exam

DUM 216	SAFETY AT SEA - IV	2+1+0	ECTS:3

Course Syllabus

Week	Subject
Week 1	Give information about SOLAS-74 and STCW-78/95 conventions.
Week 2	Fire and fire-fighting methods, writing the role of training to the ship's logbook.
Week 3	Control and maintenance of fire-fighting devices.
Week 4	Preparatory work for klass organizations with the port authorities to control the ship on fire.
Week 5	Ship firefighting plans, fire alarm devices.
Week 6	Rescue life at sea and aid. Using Life Saving vehicles, maintenance and attitudes.
Week 7	Abandon ship, life in water and hipotermia.
Week 8	Mid-term exam
Week 9	Life in lifesaving crafts.
Week 10	Practical first-aid information.
Week 11	Drugs and medicines must be found on board.
Week 12	Communication with international health stations. Courses within the evaluation of students' assignments and eliminate deficiencies.
Week 13	Methods of emergency situations.
Week 14	First measures to be taken in aground and collision.
Week 15	In an emergency, the ship's passengers, personnel and cargo protection and recovery.

Week 16	End-of-term exam

DUM 218	SHIP MANEUVERING - I	2+1+0	ECTS:3
Course Syllabus			
Week	**Subject**		
Week 1	Meaning of ship handlig, security, begin to ship handling.		
Week 2	Propulsion and resistors, weather related resistors,		
Week 3	Water related resistors, total resistance.		
Week 4	Factors that can be directly controlled; main engine, propeller.		
Week 5	Factors that can be directly controlled; rudder, bow thruster, stern thruster.		
Week 6	Factors that can be directly controlled; anchor, rope.		
Week 7	Indirect factors that can be controlled; turning circle, sideslip (broadside movement) and drift.		
Week 8	Mid-term exam		
Week 9	Indirect factors that can be controlled; trim and list.		
Week 10	Indirect factors that can be controlled; Loading condition and Inertia.		
Week 11	Indirect factors that can be controlled; Momentum.		
Week 12	Short exam, Factors that can not be controlled; shallow water.		
Week 13	Factors that can not be controlled; Narrow water.		
Week 14	Factors that can not be controlled; Wind.		
Week 15	Factors that can not be controlled; Current.		
Week 16	End-of-term exam		

THIRD YEAR FIRST SEMESTER

DUM 301	MARITIME ENGLISH - III	3+0+0	ECTS:2
Course Syllabus			
Week	**Subject**		
Week 1	Safety communication		
Week 2	Distres and Urgency communications		
Week 3	Pilotage		
Week 4	Helikopter operations		
Week 5	VTS standarts		
Week 6	Navigational varnings		
Week 7	Hydrographic İnformation		
Week 8	Mid-term exam		
Week 9	Meteorological questions and answers		
Week 10	Arrival and berthing communications		
Week 11	Avoiding dangerous situations, providing safe movement		
Week 12	GMDSS messages		
Week 13	Standard wheel orders		
Week 14	2. mid term exam		
Week 15	Standard engine orders		
Week 16	End-of-term exam		

DUM 303	CARGO HANDLING	3+1+0	ECTS:5

Course Syllabus

Week	Subject
Week 1	Dry cargoes, preparation of holds for cargo and check.
Week 2	Separation and segration of cargoes, securing of cargoes.
Week 3	Ventilation of cargoes and safety check.
Week 4	Deck and frozen cargoes.
Week 5	Container transport.
Week 6	Cargo gears and safety at loading or discharging.
Week 7	Heavy cargoes, dangerous and hazardous cargoes.
Week 8	Mid-term exam
Week 9	Concentrated cargoes, Grain cargoes.
Week 10	Tanker arrangement, pipe lines, cargo pumps.
Week 11	Tanks and checks,Tank cleaning,Tank washing methods.
Week 12	Short exam,Bilge and dirty water tanks,Clean ballast,Dirty ballast.
Week 13	Safety systems of tankers.
Week 14	Stability and stowing calculations, stowage plans, draught and trim.
Week 15	Stability and stowing calculations, stowage plans, draught and trim.
Week 16	End-of-term exam

DUM 305	MARITIME LAW - I	4+0+0	ECTS:5

Course Syllabus

Week	Subject
Week 1	Definition of Law, sources and types of law
Week 2	Definition of Law, sources and types of law
Week 3	Definition of Law, sources and types of law
Week 4	Maritime law sections and topics, Marine Public Law, Marine Administrative Law,Marine Administration Organization, functions and powers
Week 5	Safety of life and at sea,customs and financial obligations
Week 6	internal waters, territorial waters, international transitions
Week 7	contiguous zone, exclusive economic zone, international waters
Week 8	Mid-term exam
Week 9	Ship, Shipowners
Week 10	Equipment subsidiary
Week 11	Seafarers and the captain's responsibility
Week 12	Exam
Week 13	Freight contract
Week 14	Freight contract
Week 15	Ship accidents
Week 16	End-of-term exam

DUM 307	MARİNE COMMUNICATION	3+2+0	ECTS:4

Course Syllabus

Week	Subject
Week 1	Morse code to communicate with a searchlight.

Week 2	International Signal Code book, meaning a single letter signs, the use of code books.
Week 3	Radio-telephone communication, distress, urgency and security messages.
Week 4	Port authorities and marine traffic control stations and communications.
Week 5	Listen to the frequency of distress, keep the radio journal, radio-telex communication.
Week 6	Urgency of the global maritime distress and safety system, safety, distress and methods of taking and sending messages about navigation.
Week 7	The necessary methods for receive and allow distress, urgency and safety messages using earth stations.
Week 8	Mid-term exam
Week 9	Presentation of GMDSS, the new system's formation and international rules.
Week 10	COSPAS/SARSAT, EPIRB devices, INMARSAT system, the determination of maritime regions.
Week 11	Frequencies must to be list in GMDSS, frequencies are used for distress and safety messages.
Week 12	Region must be used according to the devices, INMARSAT-A and INMARSAT-C and sending an emergency call for help. Practical exam and evaluation students.
Week 13	DSC system, INMARSAT satellite communications in the general usage.
Week 14	Antenna orientation, telex satellite communication, satellite-telephone and fax communication.
Week 15	INMARSAT-M, pricing and collection.
Week 16	End-of-term exam

DUM 309	**MARITIME MANAGEMENT**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Marine Commercial Management
Week 2	According to the charter contract transport conditions
Week 3	Sefer instructions,Loading and discharge time count
Week 4	Marine Technical Management
Week 5	Follow the rules and regulations, ships to bring them into conformity with
Week 6	Monitoring of ship documents and checks,Care-attitude records, correspondence
Week 7	Technical Management Personnel Planning
Week 8	Mid-term exam
Week 9	Education in Technical Management Scope Planning
Week 10	Security and Supply management, Material tracking, Keeping records and needs and supply planning
Week 11	Ship management agreement
Week 12	Exam, Multimodal transport
Week 13	Multimodal transport
Week 14	Forvarder
Week 15	Tramp and Line Transport
Week 16	End-of-term exam

DUM 311	**SAFETY AND QUALITY MANAGEMENT**	**3+0+0**	**ECTS:5**

Course Syllabus

Week	**Subject**

Week 1	Safety Management
Week 2	Safety and Security
Week 3	Protection of the environment
Week 4	quality and quality standarts.
Week 5	ISO 9000 standarts and ISO procedures
Week 6	Quality into practice at maritime company
Week 7	Establishment and into practice of safety management system
Week 8	Mid-term exam
Week 9	ISM applications
Week 10	ISM documents
Week 11	ISPS applications
Week 12	ISPS documents
Week 13	Audit techniques
Week 14	internal audit
Week 15	external audit
Week 16	End-of-term exam

DUM 313	**PORT AND TERMINAL OPERATIONS**	**2+0+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	Description and history of the harbor
Week 2	Parts of harbor and harbor types
Week 3	Organization and management of the Port
Week 4	Principles of port authorities
Week 5	Port Services
Week 6	separation of load in ports, placement and use of bonded
Week 7	Customs Procedures
Week 8	Mid-term exam
Week 9	Customs applications
Week 10	Harbor Fees
Week 11	Working principles and methods of stacking ports.
Week 12	Exam,International port legislation and practices
Week 13	International port legislation and practices
Week 14	Harbor efficiency analysis
Week 15	Harbor efficiency analysis
Week 16	End-of-term exam

DUM 315	**SHIP POWER PLANT**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Introduction, classification of ship machinery
Week 2	Ship machinery view point of operational principles
Week 3	Steam engines
Week 4	Steam engines with pistons
Week 5	Steam turbines
Week 6	Internal combustion engines

Week 7	Diesel engines
Week 8	Mid-term exam
Week 9	Carburettor engines
Week 10	Gas turbines
Week 11	Ship machinery view point of duty
Week 12	Main engines
Week 13	Quiz
Week 14	Auxiliary engines: auxiliaries for main engine, auxiliaries for deck machinery
Week 15	Service machimery
Week 16	End-of-term exam

DUM 317	**INTERNATIONAL MARITIME CONVENTIONS - I**	**2+0+0**	**ECTS:2**
Course Syllabus			
Week	**Subject**		
Week 1	SOLAS and amendments.		
Week 2	SOLAS and amendments.		
Week 3	CLC, 1969.		
Week 4	MARPOL 73/78		
Week 5	MARPOL 73/78		
Week 6	INTERVENTION, 1969.		
Week 7	ITU Radio Regulations.		
Week 8	Mid-term exam		
Week 9	STP Convention,1971. SPACE STP, 1973		
Week 10	International Load Lines Convention,1966		
Week 11	STCW 95		
Week 12	Short exam, IHR Regulations.		
Week 13	FAL 1965		
Week 14	FAL 1965		
Week 15	Tonnage 1969 Agreement		
Week 16	End-of-term exam		

THIRD YEAR SECOND SEMESTER

DUM 302	**LONG TERM SEA TRAINING**	**8+40+0**	**ECTS:30**
Course Syllabus			
Week	**Subject**		
Week 1	Familiarization on board		
Week 2	Practice on board		
Week 3	Practice on board		
Week 4	Practice on board		
Week 5	Practice on board		
Week 6	Practice on board		
Week 7	Practice on board		
Week 8	Mid-term exam		
Week 9	Practice on board		

Week 10	Practice on board
Week 11	Practice on board
Week 12	Practice on board
Week 13	Practice on board
Week 14	Practice on board
Week 15	Practice on board
Week 16	End-of-term exam

FOURTH YEAR FIRST SEMESTER

DUM 403	**WATCHKEEPING STANDARDS - III**	**2+1+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Evaluation and application of COLREG 1972.		
Week 2	Watchkeeping arrangements and procedures during sailing.		
Week 3	Watchkeeping arrangements and procedures in port.		
Week 4	Evaluation of responsibility of each party in different collisions.		
Week 5	Navigation with pilot and information exchange between the master and the pilot.		
Week 6	Evaluation of port watchs according to safety.		
Week 7	Arrangements necessary for appropriate and effective precautions in navigation/port watches.		
Week 8	Mid-term exam		
Week 9	Coordinate with engineers in operations, MARPOL 73/78		
Week 10	Marine pollution caused problems and sharing of responsibilities.		
Week 11	Marine pollution preventive measures.		
Week 12	Short exam, STCW 95 annexes.		
Week 13	Marine Pollution,Preventions,Combat with Pollution,Cleaning Methods.		
Week 14	Marine Pollution,Preventions,Combat with Pollution,Cleaning Methods.		
Week 15	Oil record book, IOPP certificate and controls.		
Week 16	End-of-term exam		

DUM 405	**CHARTERING AND BROKERING**	**3+0+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Chartering, its practices,		
Week 2	legal aspects, chartering contracts under comparative law,		
Week 3	expenses at chartering contracts,		
Week 4	charterparty and its functions the International Conventions		
Week 5	The effects of these to charter parties at International Conventions		
Week 6	Clauses of the charter parties		
Week 7	Studies on the charter party forms used in international practics.		
Week 8	Mid-term exam		
Week 9	Tanker and bulk carriers ships used C/P in practics		
Week 10	Brokering operations		
Week 11	Online borkering operation		

Week 12	quiz
Week 13	Prices at Brokering operations
Week 14	check at documents of brokering and chartering
Week 15	online operaion
Week 16	End-of-term exam

DUM 407	INTERNATIONAL MARITIME CONVENTIONS - II	2+0+0	ECTS:2

Course Syllabus

Week	Subject
Week 1	The documents on board according the international maritime conventions
Week 2	The responsibilities related with Loadline convention
Week 3	The responsibilities related with SOLAS.
Week 4	The responsibilities related with SOLAS.
Week 5	The responsibilities related with MARPOL 73/78.
Week 6	The responsibilities related with MARPOL 73/78.
Week 7	The necessities in international health regulations and marine health declaration.
Week 8	Mid-term exam
Week 9	The necessities in international health regulations and marine health declaration.
Week 10	The responsibilities under the effects of the international conventions on safety of the ship, passenger, crew and cargo.
Week 11	The responsibilities under the effects of the international conventions on safety of the ship, passenger, crew and cargo.
Week 12	Short exam. The methods and tools to prevent the vessel based pollutions of environment of the seas.
Week 13	The methods and tools to prevent the vessel based pollutions of environment of the seas.
Week 14	The national legislations which are related with application of the international conventions.
Week 15	The national legislations which are related with application of the international conventions.
Week 16	End-of-term exam

DUM 409	SHIP MANEGEMENT	2+1+0	ECTS:4

Course Syllabus

Week	Subject
Week 1	Bridge Team Management education.
Week 2	Bridge Team Management education.
Week 3	Familiarization with the simulators characteristics and controls
Week 4	Familiarization with the vessel types in simulator characteristics and controls.
Week 5	Review of basic radar and plotting.
Week 6	Exercises in navigation and collision avoidance in confined and congested waters.
Week 7	Exercises in and near traffic separation schemes.
Week 8	Mid-term exam
Week 9	IMO performance standards for ARPA, Principal ARPA systems.
Week 10	In ARPA, acquisition of targets, tracking capabilities and limitations, processes delays.
Week 11	Setting up and maintaining displays, representation of target information and errors of interpretation in ARPA.Errors in displayed data on ARPA, system operational tests.
Week 12	Short exam. Risk of over-reliance on ARPA.Obtaining information from ARPA displays.

Week 13	Risk of over-reliance on ARPA.Obtaining information from ARPA displays.
Week 14	Application of COLREG 1972 on ARPA.
Week 15	Application of COLREG 1972 on ARPA.
Week 16	End-of-term exam

DUM 411	CARGO HANDLING AND SHIP STABILITY	3+1+0	ECTS:5
Course Syllabus			
Week	**Subject**		
Week 1	Calculating the effect of free surface of liquids (FSE)		
Week 2	Bilging and permeability		
Week 3	Drydocking and grounding		
Week 4	Heel due to turning		
Week 5	Ship Stability and Ship Strength		
Week 6	Bending of beams, Bending of ships		
Week 7	Strength curves for ships, Bending and shear stresses		
Week 8	Mid-term exam		
Week 9	Dry Cargoes		
Week 10	Inspection And Preparation Of Holds		
Week 11	Segregation And Seperation Of Cargoes		
Week 12	Securing Cargoes, Ventilation And Control Of Sweat		
Week 13	Quiz		
Week 14	Deck Kargo, Refrigerated Cargo, Container		
Week 15	Cargo Handling, Cargo-Handling Equipment, Cargo Handling Safety		
Week 16	End-of-term exam		

DUM 415	METEOROLOGY AND OCEANOGRAPHY	2+1+0	ECTS:3
Course Syllabus			
Week	**Subject**		
Week 1	Research processes		
Week 2	Ocean and sea concept, pilot charts		
Week 3	Topography of the ocean bottom, shores, islands, sediments		
Week 4	Physical and chemical properties of seawater		
Week 5	Waves; sea, swell and their effect		
Week 6	Currents and tides in oceans and seas		
Week 7	Air masses and fronts		
Week 8	Mid-term exam		
Week 9	exam		
Week 10	Cyclones and anticyclones Tropical cyclones; their sings, formation and movements, dangerous and navigable semicircle, tornado, waterspout		
Week 11	Weather forecasting		
Week 12	Marine meteorological services Ship codes		
Week 13	Weather routeing		
Week 14	Student presentation		
Week 15	Student presentation		
Week 16	End-of-term exam		

DUM 419	NAVIGATION - III	2+0+1	ECTS:4

Course Syllabus

Week	Subject
Week 1	The important procedures in coastal navigation, voyage planning procedures in coastal navigation.
Week 2	Navigation procedures in traffic separation zones, for passages through straits, when navigating near costs and in restricted visibility.
Week 3	Calculation of the effects currents and wind.
Week 4	Navigational triangle for solution of current problems.
Week 5	Basic theory of the tides, spring-neap tides and relevant definitions.
Week 6	Tidal problems and solutions for main ports and secondary ports.
Week 7	Tide solution methods according to american and admiralty tide tables.
Week 8	Mid-term exam
Week 9	Tidal streams and calculations.
Week 10	Great circle sailing and composite sailing.
Week 11	Navigation planning in ocean voyages.
Week 12	Short exam, Usage of the nautical publications relevant with ocean voyages.
Week 13	Navigation on higher latitudes and within ice limits.
Week 14	Procedures for keeping a log-book at sea, ocean and port.
Week 15	Ship reporting systems AMVER etc. Procedures for the search and rescue navigation.
Week 16	End-of-term exam

DUM 421	SAFETY AT SEA V	2+1+0	ECTS:3

Course Syllabus

Week	Subject
Week 1	Information about SOLAS-74 and STCW-78/95, ISPS and ISM procedures.
Week 2	The availability of medical care on ships, regulation and management.
Week 3	The administration of emergency situations.
Week 4	Ship beach methods, work to be done in stranded ships and damage control, measures to be taken
Week 5	Collision and the measures to be taken and damage control.
Week 6	Usage of emergency steering and coordination of emergency steering team.
Week 7	Emergency towing system and towing procedures; methods of pulling the ship damaged after fire or explosion.
Week 8	Mid-term exam
Week 9	Rescue and aid operations coordination.
Week 10	How to be continued ship's crew and passengers' safety and security.
Week 11	Working conditions of life saving, fire fighting and other security systems.
Week 12	Assessment of works within the semester and elimination of deficiency in the lesson.
Week 13	Development of emergency and damage control plan.
Week 14	Measures to be taken in case of emergency occurring in the port. Methods of abandoning ship.
Week 15	Assistance to ships in danger. Man over board procedures. General review of the topics discussed throughout the semester. Course completion and excuses week
Week 16	End-of-term exam

FOURTH YEAR SECOND SEMESTER

TEZ 400	GRADUATION PROJECT	0+6+0	ECTS:6

Course Syllabus

Week	Subject
Week 1	Selection of Subject
Week 2	Literature review
Week 3	Literature review
Week 4	Literature review
Week 5	Deciding the subtitles of subject
Week 6	Analysis of subjects
Week 7	Analysis of subjects
Week 8	Mid-term exam
Week 9	Analysis of subjects
Week 10	Analysis of subjects
Week 11	Analysis of subjects
Week 12	Discussion with supervisor
Week 13	Discussion with supervisor
Week 14	Corrections and control
Week 15	Writiing the thesis and submission
Week 16	End-of-term exam

DUM 412	MARITIME INSURANCE	2+0+0	ECTS:2

Course Syllabus

Week	Subject
Week 1	Insurance concept and description
Week 2	Insurance contract and its elements
Week 3	Basic principles of insurance
Week 4	Insurance Types
Week 5	marine risks and the concept of marine insurance
Week 6	Types of Marine Insurance
Week 7	Vessel insurance and Vesselinsurance contract
Week 8	Mid-term exam
Week 9	Determination of Vessel insurance premiums
Week 10	Determination of Vessel insurance premiums
Week 11	After the accident the insurance operations
Week 12	Exam, Preparation of expert reports
Week 13	Calculation of compensation
Week 14	Calculation and payment of compensation
Week 15	The rights of the insurer and the insured
Week 16	End-of-term exam

DUM 404	LOGISTIC	2+0+0	ECTS:2

Course Syllabus

Week	Subject
Week 1	Logistics concept and description.

Week 2	Logicalsector and its historical development
Week 3	The definition of international logistics system
Week 4	The concept of supply chain
Week 5	International distribution channels
Week 6	Transport forms and Maritime transport.
Week 7	Transport forms and Maritime transport.
Week 8	Mid-term exam
Week 9	The concept of integrated transport.
Week 10	The concept of integrated transport and the selection of International transport modes .
Week 11	Financial resources in international logistics.
Week 12	Exam,The role of logistics in import and export.
Week 13	The role of logistics in import and export.
Week 14	Marine logistics concepts.
Week 15	Marine logistics concepts.
Week 16	End-of-term exam

DUM 418	**OPERATIONAL RESEARCH**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Operation researh concept and background
Week 2	Operation researh prenciples
Week 3	System concept, objective function and constraits, mathematical models
Week 4	Linear programming models
Week 5	Optimization models in linear programming
Week 6	Solution methods of linear programming
Week 7	Graphical solution method
Week 8	Mid-term exam
Week 9	Simplex method
Week 10	Transportation problem and modelling
Week 11	Optimum solution of transportation models
Week 12	Assignment problems, modelling and optimum solutions
Week 13	Assignment problems, modelling and optimum solutions
Week 14	Queuing theory, modelling arrival and sevice processes
Week 15	Single server and parallel severs modelling
Week 16	End-of-term exam

DUM 416	**TANKER OPERATIONS**	**3+0+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	MARPOL Convention and annexes.
Week 2	Properties and hazards of petroleum cargo, safety equipment, personnel safety.
Week 3	Properties and hazards of chemichal cargo, safety equipment.
Week 4	Properties and hazards of liquefied gas cargo and safety equipment.
Week 5	General information about using of tanker simülations.
Week 6	Control features of the simulator which related to liquefied gas loads and features, recognition of the ship.

Week 7	Oil tankers and chemical tankers with the relevant national and international rules.
Week 8	Mid-term exam
Week 9	Oil tanker operations.
Week 10	Oil tanker operations.
Week 11	chemical tanker operations.
Week 12	chemical tanker operations.
Week 13	. Environmental pollution prevention policies.
Week 14	Gas tanker operations.
Week 15	Presentation and use of ISGOTT book.
Week 16	End-of-term exam

DUM 408	**MARINE LAW - II**	**3+0+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Divisions of Maritime Law and their subjects. Maritime commercial law, branches, sources, historical development and specifications of maritime law.		
Week 2	Maritime public law, maritime administrative law. Related Administrative organizations and their duties and liabilities.		
Week 3	Safety at sea for life and property. Custom affairs and transactions and financial obligations. Ship, registration of ship, flag, ship owner, captain.Regulations regarding shipping law ship seaworthiness, port of registry.		
Week 4	Captain (Master) definition duties, authorizations and liabilities of master.		
Week 5	Shipowner, disponent owner, limited and/or unlimited liabilities		
Week 6	Carriage contracts (contract of affretments) Carrier, liabilities and limitations.		
Week 7	Accidents at sea, collision, salvage, general average.		
Week 8	Mid-term exam		
Week 9	Special rights a maritime lien or ships or cargoes.		
Week 10	Regulations regarding sea pollution Marine insurance.		
Week 11	Definition of insurance, important concepts, insurance policy, contract of insurance, function of the insurance in the General average.		
Week 13	Maritime penal/criminal law, regulations regarding sea pollution international law of the sea, internal waters, territorial waters, contiguous zone, blockade, embargo. Maritime labour and social security law.		
Week 14	Machinery and general clauses of Turhish Hull insurance and institute clauses, P and I club insurance.		
Week 16	End-of-term exam		

DUM 414	**SHIP MANEUVERING**	**2+1+0**	**ECTS:3**
Course Syllabus			
Week	**Subject**		
Week 1	Maneuvering preparations for the pilot station.		
Week 2	Ship maneuver in the narrow channels and rivers.		
Week 3	Ship maneuver in the shallow water. Squat.		
Week 4	Ship maneuver in the traffic separation zone.		
Week 5	Anchoring and ship to ship cargo operations.		
Week 6	Ship maneuver in bad weather conditions.		
Week 7	Using rope methods at ship maneuver.		

Week 8	Mid-term exam
Week 9	Arrival-departure maneuver with tug and without tug.
Week 10	Dedection of stopping distance and turning circle in different situtation.
Week 11	Navigation in ice sea.
Week 12	Short exam, Navigation in tropical zones.
Week 13	Effects of wind and currents on the ship.
Week 14	Methods for towing procedures.
Week 15	Effects of squat at ships.
Week 16	End-of-term exam

DUM 406	**ELECTRONICAL NAVIGATION - II**	**3+1+0**	**ECTS:4**

Course Syllabus

Week	**Subject**
Week 1	The Basic Theory of Marine Radar; Fundamental principles of radar, Block diagram of the Radar.
Week 2	Radiation and safety precautions, Types of radar, radar bands, The radar beam.
Week 3	Factors affecting the radar display, Capabilities and limitation of the radar, Performance standards of Radar Resolution A.477(XII), Operation of the radar.
Week 4	Types of radar display, The use of radar controls, Set up and maintain radar display, Measure ranges and bearings, Manual Radar Plotting.
Week 5	Construct the relative motion triangle, Determine course, speed and aspect of other ships, CPA and TCPA, Application of plotting in maneuvers to avoid collision.
Week 6	Report radar plot data. Use Radar to Ensure Safe Navigation; Fix vessel's position by radar, Aids to radar navigation and safety Using radar for Maneuvers to avoid collision without radar plotting, Use parallel indexing in radar navigation.
Week 7	Automatic Radar Plotting Aids (ARPA); Radars with semi and full automatic plotting capability, Operation principles of ARPA.
Week 8	Mid-term exam
Week 9	IMO performances standards for ARPA, Acquisition of targets, Tracking capabilities and limitations, Symbols and controls of ARPA.
Week 10	Radars with semi and full automatic plotting, Operation principles of ARPA, IMO performances standards for ARPA, Acquisition of targets,
Week 11	Tracking capabilities and limitations in ARPA, Symbols and controls of ARPA, Processing delay.
Week 12	Short exam, Operate an ARPA System, Set up and maintain an ARPA display, Types of display of ARPA.
Week 13	Obtain target information, Potential Point of Collision, Predicted Area of Danger.
Week 14	Errors in ARPA data, System tests to determine data accuracy.
Week 15	Obtain information from ARPA display, The evaluation of ARPA display, ARPA and Collision Regulation.
Week 16	End-of-term exam

DUM 422	**PERSONNEL MANAGEMENT**	**2+0+0**	**ECTS:2**

Course Syllabus

Week	**Subject**
Week 1	Management concepts and description
Week 2	Historical Development of Management Sciences

Week 3	Management principles
Week 4	Personnel management and employee organization
Week 5	Human Resources Management
Week 6	Personnel recruitment and orientation
Week 7	The concept of total quality management and application of marine businesses
Week 8	Mid-term exam
Week 9	Relevant international maritime conventions and national laws.
Week 10	Relevant international maritime conventions and national laws.
Week 11	Crisis management and human behavior
Week 12	Exam,passengers - staff relations
Week 13	passengers - staff relations
Week 14	crowd management
Week 15	crowd management, Recompense
Week 16	End-of-term exam

DUM 402	**MARİTİME ENGLİSH - IV**	**3+0+0**	**ECTS:3**

Course Syllabus

Week	**Subject**
Week 1	Rules for technical writing
Week 2	Maritime trade communications
Week 3	Trade rules,
Week 4	Writting Notice of readiness
Week 5	Writting Notice of readiness
Week 6	Writing a letter of protest
Week 7	Writing a letter of protest
Week 8	Mid-term exam
Week 9	Writing a letter of protest
Week 10	Filling the bill of lading
Week 11	Filling in the bill of lading
Week 12	Standart contract for sale of vessels for demolition and recycling
Week 13	Standard Ship Repair Contract
Week 14	2. mid term exem
Week 15	STtandart Disbursement Account
Week 16	End-of-term exam

6. ACADEMIC PERSONAL DATABASE

ACADEMIC PERSONAL DATABASE

FAMILY NAME	**NAME**	**DEGREE**	**MARITIME LICENSE**	**ACADEMIC POSITION**
BAŞAR	**ERSAN**	**PhD. (Eng)**	**Master Mariner**	**Assist.Prof.Dr.**

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LANGUAGE	**SPECIALITIES**
1. Turkish 2. Russian 3. English	1. Oil Spill 2. Modelling 3. Seafarer life

RESEARCH INTERESTS	**TEACHING SPECIALITIES**
1. Oil Spill simulation 2. Ship Accident Analysis 3. Seafarer	1. Oil Spill and Cleanup 2. Seamanship 3. Quality and Management

PUBLICATIONS (5 ONLY AFTER 2005)

E, BAŞAR, (2010) 'Investigation into Marine Traffic and a Risky Area in the Turkish Straits System: Canakkale Strait', Transport, 25(1), pp.5-10

E, BAŞAR, (2010) 'Weathering and Oil Spill Simulation in the Aftermath of Tanker Accidents at the Junction Points in the Marmara Sea', Fresenius Environmental Bulletin, 19(2), pp.260-265

E, BAŞAR, (2009) 'Simulations of oil spill from tanker accident at the junction points', InterSpill 2009 Coferance, Marsilya, France

E, BAŞAR, E. KÖSE and A, GÜNEROĞLU, (2006) 'Finding Risky Areas for Oil Spillage after Tanker Accidents at Istanbul Strait', Int. J. Environment and Pollution, Vol.27, No.4, pp.538-544

E, BAŞAR, The Training Model of Turkish Seafarers Who Work on Fishing Vessel According to STCW-F Convention Training System And Safety Rules, 1st Biannual Scientific Conferance Black Sea Ecosystem 2005 and Beyond, İstanbul,8-10 May 2006.

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>GUNEROGLU</td><td>ABDULAZIZ</td><td>PhD (Eng)</td><td>Restricted Mariner</td><td>Assist.Prof.Dr</td></tr>
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61600 Surmene, Trabzon
Turkey</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Turkish

2. English</td><td colspan="3">1. Oceanography&Marine Ecology

2. Remote Sensing&GIS

3. Maritime Transport</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Marine pollution and risk assesment

2. International Maritime Piracy

3. Port site selection analysis</td><td colspan="2">1. Global Climate Change and Oceanography
2.Meteorology and Oceanography
3. Remote Sensing of Environment
4. Maritime English</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">Guneroglu, A , Köse, E. Erüz, C.,Başar, E.,Erkebay, Ş.,Karsli, F.,(2005) “Geographic Information System(GIS) for Selection of Fish Farming Areas in Sürmene Bay” , Israeli Journal of Aquaculture-Bamidgeh,Vol.57(2),pp.81-89.
Basar, E., Kose, E., Guneroglu, A., (2006) “Finding risky areas for oil spillage after tanker accidents at Istanbul strait”, International Journal of Environment and Pollution,Vol.27(4), pp.388-400.
Guneroglu, A., Köse, E., Karslı, F. and Feyzioğlu, M.(2010) “Intercomparison and Usage of different Chl-a Algorithms and In-situ Validitation of OC3M in Continental Shelf Waters of the Black Sea for Monitoring Eutrophication” , Fresenius Environmental Bulletein, Vol.19(3), pp.452-460.
Dihkan, M.,Karsli, F. and Guneroglu, A.(2011) “Mapping total suspended matter concentrations in the Black Sea using Landsat TM multispectral images,Vol.20 (1), pp.xx-xx.
Ozdemir, U. and Guneroglu, A.(2011) “Port site selection and rehabilitation activities in Turkey” proceedings of The First Global International Conference on Innovation in Marine Technology and Future of Maritime Transportation Istanbul Tech.Unv. 24-26 Nov.2010, Turkey.</td></tr>
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<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>UĞURLU</td><td>ÖZKAN</td><td>M. Sc.</td><td>Oceangoing Master</td><td>Lecturer</td></tr>
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ougurlu@ktu.edu.tr

ADDRESS: Faculty of Marine Sciences, Maritime Transportation and Management Engineering Department, 61600 Sürmene/TRABZON/TURKEY</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Turkish

2. English

3.</td><td colspan="3">1. Ship’s Operations and Tanker Operations

2. Tanker Incidents

3. Safety at Sea</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Tanker Incidents

2. BTC and BOTAŞ Marine Terminal Simulation

3.</td><td colspan="2">1.Electronical Navigation
2. Tanker Operations
3.Ship Management
4.Safety at Sea</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1.’’ BTC and BOTAŞ Marine Terminal Simulation’’ Trabzon 2006</td></tr>
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<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>GEDİK</td><td>NEBİ</td><td>M. Sc.</td><td></td><td>LECTURER</td></tr>
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ADDRESS: KTU Faculty of Marine Sciences, Department of Maritime Transportation and Management Engineering, Sürmene, 61600 Trabzon Türkiye</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. English

2.Turkish

3.</td><td colspan="3">1. Marine Elecric and Electronics

2. Ship Control and Automation

3.</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Image Processing

2. Ship Electric and Electronics Systems

3. Unmanned Ship</td><td colspan="2">1. Marine Elecric and Electronics

2. Ship Control and Automation

3. Computer Technology and Programming</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
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<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>YÜKSEKYILDIZ</td><td>ERCAN</td><td>M. Sc.</td><td>Oceangoing Chief Officer</td><td>Lecturer</td></tr>
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ADDRESS: Faculty of Marine Sciences, Maritime Transportation and Management Engineering Department, 61600 Sürmene/TRABZON/TURKEY</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Turkish
2. English
3.</td><td colspan="3">1. Navigation
2. Marine Communication
3. Ship’s & Port Operations</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Analysis of Port Hinterland
2. Forecasting of Port Handling Capacity
3. Productivity of Port</td><td colspan="2">1. Navigation
2. Marine Communication
3. Electronical Navigation</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1. “Hinterland Analysis of Trabzon, Samsun, Rize and Hopa Ports” Trabzon 2010</td></tr>
<tr><td colspan="5">ACADEMIC PERSONAL DATABASE</td></tr>
<tr><td>FAMILY NAME</td><td>NAME</td><td>DEGREE</td><td>MARITIME LICENSE</td><td>ACADEMIC POSITION</td></tr>
<tr><td>EROL</td><td>SERCAN</td><td>M. Sc. (Tr)</td><td></td><td>Lecturer</td></tr>
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ADDRESS: Karadeniz Technical University, Marine Sciences Faculty, Marine Transportation and business Engineering
61600 Trabzon/Turkey</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Turkish
2. English</td><td colspan="3">1. Marine Insurance
2. Marine Business
3. Academic maritime education</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Marine Insurance
2. Marine Business
3. Academic maritime education</td><td colspan="2">1. Maritime Low
2. Marine Insurance
3. Personnel management
4. Marine Business
5. Logistics
6. Economy
7. Port and terminal operations</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">Sercan EROL: Analysis of Some of the Amendments in the Draft Turkish Trade Law that Outlines the Status of a Ship in the Maritime Trade Law”, The First Global Conference on Innovatıon ın Marıne Technology and The Future of Marıtıme Transportatıon, İstanbul 2010
Sercan EROL ve Ersan BAŞAR: “Zorunlu Mali Sorumluluk Sigortasının Kıyı Tesislerinde Uygulanması”, Türkiye'nin Kıyı ve Deniz Alamları VIII. Ulusal Kongresi, Trabzon, 2010.
Ersan BAŞAR ve Sercan EROL: Karadenideki Tanker Trafiğinin Belirlenerek Tahmini Kaza Alanlarının Tespiti, Türkiye'nin Kıyı ve Deniz Alamları VIII. Ulusal Kongresi, Trabzon, 2010.</td></tr>
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<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>YILDIRIM</td><td>UMUT</td><td>B.Sc</td><td>Oceangoing Master</td><td>Lecturer</td></tr>
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<tr><td>1. Turkish
2. English</td><td colspan="3">1. Cargo Handling
2. Ship Maneuvering
3. Watchkeeping Standarts</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Human Factor in Marine Incidents</td><td colspan="2">Cargo Handling
Ship Management
Ship Maneuvering
Watchkeeping Standarts</td></tr>
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<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>EYÜBOĞLU</td><td>EKREM</td><td>M. Sc.</td><td>Electric – Electronics Engineer</td><td>Res. Assist.</td></tr>
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<tr><td>1. Turkish
2. English</td><td colspan="3">1. Marine Communication
2. Marine Electric and Electronics
3. RADARs</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Electromagnetic Fields
2. Propagation
3. Antennas</td><td colspan="2">- None</td></tr>
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<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">“ Measurement of TV/Radio Transmitters at Trabzon – Boztepe Region Induced Electric Field Strength and Evaluation of Results ” ELECO Bursa, Turkey 2010</td></tr>
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ACADEMIC PERSONAL DATABASE				
FAMILY NAME	**NAME**	**DEGREE**	**MARITIME LICENSE**	**ACADEMIC POSITION**
YILMAZ YÜKSEKYILDIZ	**HATİCE**	**B.Sc**	**Oceangoing Watchkeeping Officer**	**Research Assistant**

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LANGUAGE	**SPECIALITIES**
1. Turkish 2. English	1. Navigation 2. Ship's & Port Operations 3. Maritime Transport

RESEARCH INTERESTS	**TEACHING SPECIALITIES**
1. Fatigue	1. Practical lessons related maritime as assistant lecturer.

PUBLICATIONS (5 ONLY AFTER 2005)

ACADEMIC PERSONAL DATABASE				
FAMILY NAME	**NAME**	**DEGREE**	**MARITIME LICENSE**	**ACADEMIC POSITION**
ÖZDEMİR	**ÜNAL**	**B.Sc**	**Oceangoing Watchkeeping Officer**	**Research Assistant**

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EMAIL

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LANGUAGE	**SPECIALITIES**
1. Turkish 2. English	1. Navigation 2. Ship's & Port Operations 3. Maritime Transport

RESEARCH INTERESTS	**TEACHING SPECIALITIES**
1. Fatigue	1. Practical lessons related maritime as assistant lecturer.

PUBLICATIONS (5 ONLY AFTER 2005)

UNDERGRADUATE STUDY

AFTER COMPLETING 1 YEARS AT SCHOOL -TRAINING ON CARGO SHIPS	-2.5 MONTHS
AFTER COMPLETING 2 YEARS AT SCHOOL -TRAINING ON CARGO SHIPS	-2.5 MONTHS -7 MONTHS
AFTER COMPLETING 2.5 YEARS AT SCHOOL -TRAINING ON CARGO SHIPS	
TOTAL	12 MONTHS

5.2.9 Kyiv State Maritime Academy (Ukraine)

Kyiv State Maritime Academy ***after hetman Petro Konashevich-Sahaydachniy***

Rector: **Vladyslav V. Panin** Doctor of Sciences, Prof.
Address: **9, Frunze St., Kyiv, 04071, Ukraine**
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Fax: **+38 044 463 74 70 / +38 044 4177433**
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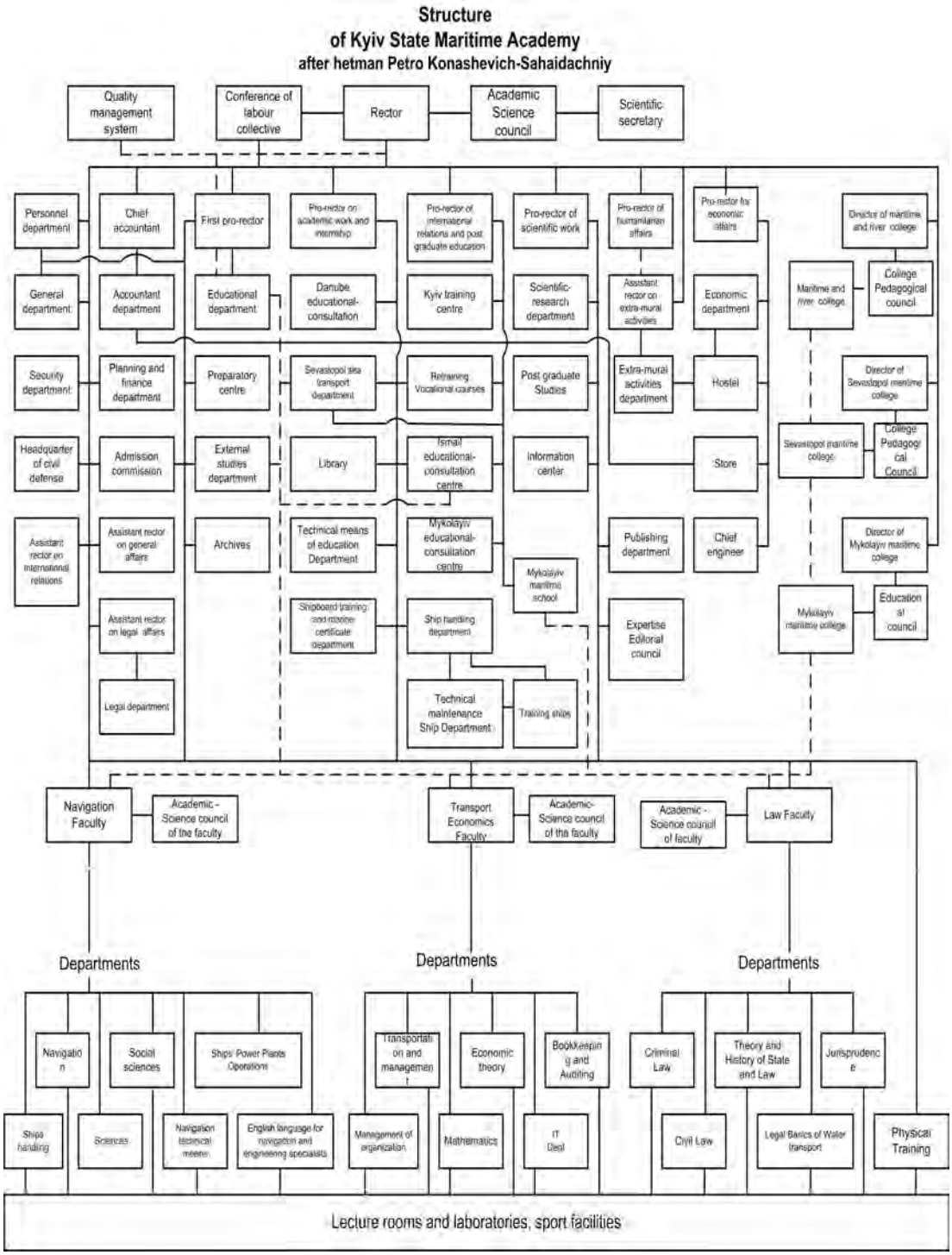
e-mail: **academy@maritime.kiev.ua**

Kyiv State Maritime Academy
after Hetman Petro Konashevich-Sahaydachniy.
General advertising.

The ancestry of the Academy was Kiev Transport College, founded in 1912 whereby Union of navigators investments. Since 1998 Academy became an independent higher educational unit of III-IV degree accreditation. At 2009 students number reached about 7.000.
Nowadays Academy includes:
-**three faculties - Navigation**, **Transport Economics** & **Law** study specialists of six professions of III-IV degree accreditation (navigation at sea and inland water ways; ships' power plants operation; management of organizations; counting and auditing; legislation; software for automatic systems.);
-**Kyiv marine and river college**, training specialists of six professions of I-st degree accreditation (navigation at sea and inland water ways, ships' power plants operation; assembly and design of nautical machines and mechanisms; book-keeping; legislation; computer programming);
-**Sevastopol maritime college** training of three professions seafarers of I degree accreditation (navigation at sea; ships' power plants operation, operators of electrical and automation systems);
-**Sevastopol faculty of maritime transport**;
-**Mykolayiv nautical school**;
-**Danube educational-consultation centre**;
-**Mykolayiv, Izmail educational-consultation centers**;
-**Kyiv simulator center of maritime transport specialists training**;
The Academy staff and sources includes three educational campuses, over 50 laboratories for common and professional knowledge, 6 computerized laboratories equipped with computers of latest generation, library with 250.000 publications, conference hall, sport facilities for physical training & games, stadium, student hostel & swimming pool.

In compliance with STCW Code requirements (Code on Standards of Training, Certification and Watch keeping for Seafarers) all students undergo their shipboard practice during process of education. The main terms for navigation students are 12 months' seagoing service & 8 months for marine engineering students. Besides sea practice marine engineering students obtained technological training at Academy's workshops and ship yards.
Students pass shipboard training on m/v "St.Olga" (Mykolayiv) and "Horizont" (Sevastopol). Senior students pass their sea service on board of Ukrainian and foreign vessels.

The educational process for III-IV degree accreditation consists 19 departments, with 220 Academy staff (professors, associate professors, lectures, assistants) more than 50 experienced seafarers so as - DSCs, Ch. engineers and others.
Special attention paid to fundamental and practical scientific research in the field of transport, based on International legislation, Ministry of transport and communication of Ukraine and Marine administration requirements.
Academy carries out seafarer's qualification improvement in accordance with requirements of ISO 9001-2009.
Academy carries out international cooperation with higher institutions of Russian Federation water transportation and other foreign countries sustaining and strengthening the authority of higher national maritime education. Within 2004-2010 the Academy passed two inspections of quality experts of European commission.
Being oriented by international standards, Academy encourages achievement of student's high quality training and contributes successful applying for first job opportunity and professional career at sea. At the end of 2005, Academy personal awarded Cabinet Ministers for outstanding incomes in development of education and highly qualified professionals training.



Training ships "St. Olga" (port Nikolaev, flag Ukraine)

Year and place of launched: 1972, state Poland, Gdansk.

Capacity: 6127 rt.

Power of m/m: 4050 kW.

Basic sizes of ship:

- Length: 112, 9 m

- Breadth: 17 m
- Height of side: 9,9 m
- Draught: 5,1 m
- Cadets: 120

Training ships "Horizont" (port Sevastopol, flag Ukraine)

Year and place of launched: 1962, Poland.
Capacity: 895 rt.
Power of m/m: 2206 kW.

Basic sizes of ship:

- Length: 59,9 m
- Breadth: 10,4 m
- Height: 4,9 m
- Draught: 3,96 m
- Cadets: 40

Academic Personal Database

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>NOSOVSKYI</td><td>ANDRII</td><td></td><td>Master Mariner</td><td>Senior Lecturer</td></tr>
<tr><td rowspan="5">TEL.
+380444637471
FAX
+380444637471
MOBILE
+380675012272
EMAIL
andreyn@i.kiev.ua
ADDRESS: Kyiv State Maritime Academy,
9, Frunze St., Kyiv,
Ukraine, 04071</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Russian

2. English

3. Ukrainian</td><td colspan="3">1. Navigation

2. Ship handling

3. Maritime safety and Security</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Academic maritime education

2. Ship handling</td><td colspan="2">1. Navigation

2. Ship handling</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1.“ SYMBOLIC SIMULATION OF COMPLEX DYNAMIC SYSTEMS AT THE TRANSPORT INDUSTRY (2010, Kiev)</td></tr>
</table>

5.2.10 Odessa National Maritime Academy (Ukraine)

National system of the education and MET in Ukraine.

Ukraine is the maritime country situated on the coasts of the Black Sea and Azov Sea. The country has a wide spread marine infrastructure which comprises 19 seaports, 11 shipyards (ship-repairing and shipbuilding plants).

Four of nine international transport corridors established by Creat's Conference under the auspices of the European Union pass through the territory of Ukraine.

In compliance with the legislation of Ukraine the functions of Maritime Administration are fulfilled by the Ministry of Transport and Communications of Ukraine. The Ministry is situated in the capital of Ukraine – Kyiv.

Maritime Administration of Ukraine takes all measures for ensuring navigational safety, saving human life at sea and environment protection. Special attention is constantly paid to the main part of safety at sea – the role of human factor. That's why the principal accent is placed on the development and advancement of the national system of education, training, competency assessment and certification of seafarers. The functioning of this system is under constant control of the Administration in accordance with the requirements of STCW Convention Regulation I/8.

The following MET system is established in Ukraine.

There are four educational – qualification levels. First level – Junior Specialist, 2nd level – Bachelor of Science, 3rd level – Specialist and 4th level is Master of Science.

Junior Specialist term of studies – 2 or 4 years depends of the level of the secondary education. Bachelor of Sciences, term of studies – 4 years, including on board training according to STCW for obtaining a Certificate of Competence for holding a position of an officer on the operational level. Specialist or Master of Science term of studies - 1,5 years, including on board training that provides mastering the knowledge required for performing the management level functions and innovative type tasks solving.

For the Bachelor's of Sciences degree, competence demonstration is performed with the help of a module control, thesis and project defense, defense of approved seagoing service and training on ship reports with the use of a Training Record Book and a state attestation. The State attestation is carried out as an exam that consists of two parts – practical and theoretical. The practical part is carried out with the use of simulators. For instance, competence examination for navigators "Use of Radar and ARPA to maintain safety of navigation", "Maintain a safe navigational watch" is carried out on a simulator before taking a theoretical part. The State Examination Board is given a document about an academic curriculum accomplishment, a Training Record Book, mandatory and optional certificates (look at the table).

Table 1.Mandatory and Non-mandatory certificates for issuing Certificates of Competence of Officer in charge of a navigational watch

Mandatory certificates	Non-mandatory certificates
1) Personal sea survival (A-VI/1); 2) Proficiency in survival craft and rescue boats other than fast rescue boats (A-VI/2); 3) Advanced Fire fighting (A-VI/3); 4) Medical first aid on board ship (A-VI/4-1); 5) Radar Navigation – operational level (A-II/1); 6) GMDSS radio operator (A-IV/2)	1) Carriage of dangerous and hazardous substances (B-V/b, B-V/c); 2) Oil tankers (A-V/1-8); 3) Chemical tankers (A-V/1-15); 4) Liquefied gas tankers (A-V/1-22); 5) Ro-Ro passenger ships (A-V/2); 6) Passenger ships other than Ro-Ro (A-V/3)

Theoretical exam covers all the aspects of professional activities with a demonstration of theoretical knowledge bases in corresponding STCW Code functions on the operational level.

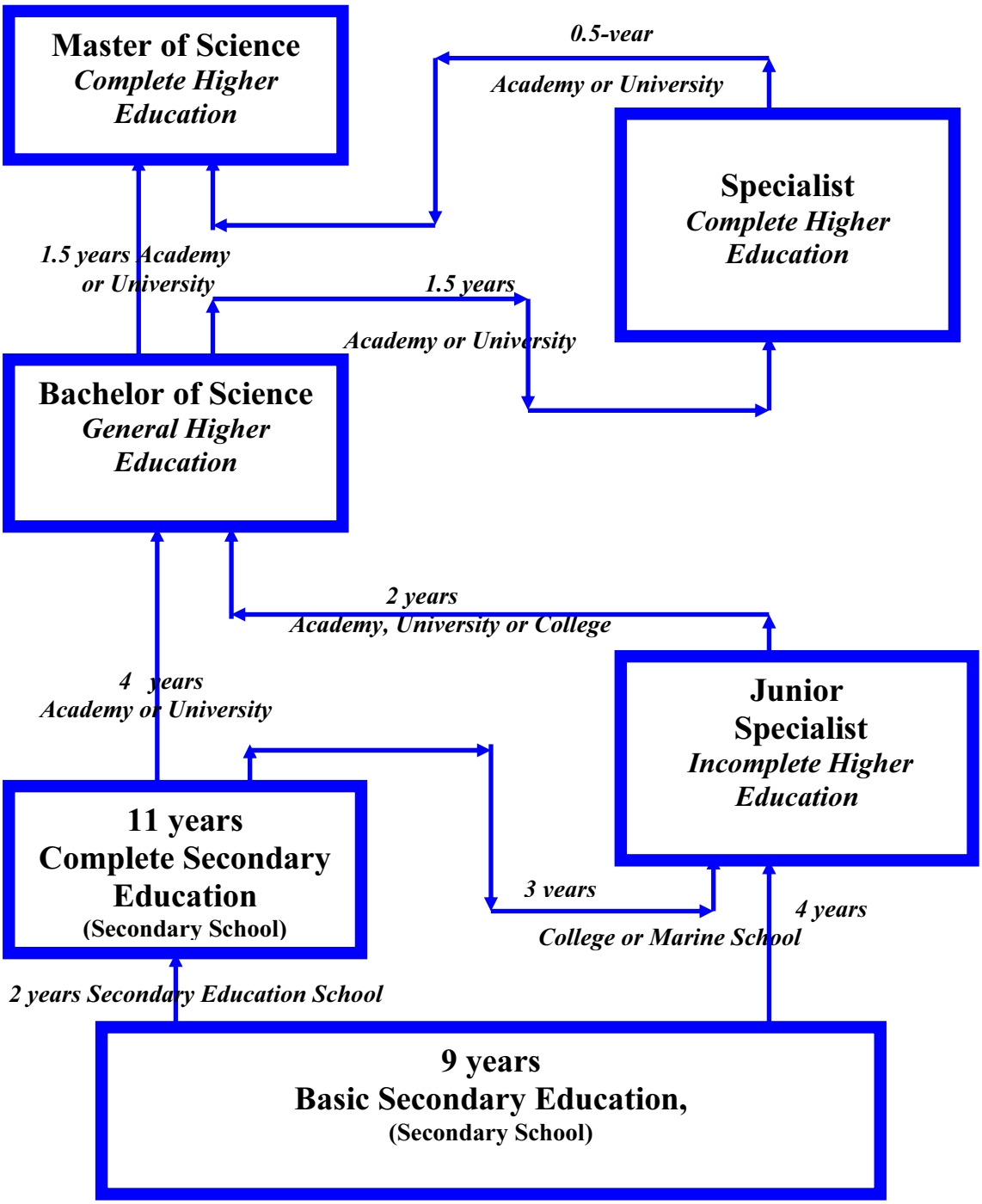
Master's of Sciences (Specialist's, Certified Engineer) training program provides obtaining knowledge and skills in STCW competences on the management level in corresponding functions. Competence demonstration is carried out with the help of a module control, thesis and project defense, defense of seagoing service report and a state attestation. For Master's of Sciences (Specialist's, Certified Engineer) degree the state attestation is in a form of defense of the thesis containing not only routine calculations but also an independent research of a problem given by the chair. In future, on the condition of having a required record of service, Master's of Sciences (Specialist's, Certified Engineer's) degree diploma gives an opportunity to obtain corresponding Certificates of competence up to the Captain and Chief Engineer without additional education and training. If it is required, the State Qualification Board can recommend having short-term upgrading courses to a candidate for obtaining a corresponding certificate.

Educational establishments engaged in maritime training go through accreditation procedure of MES of Ukraine.

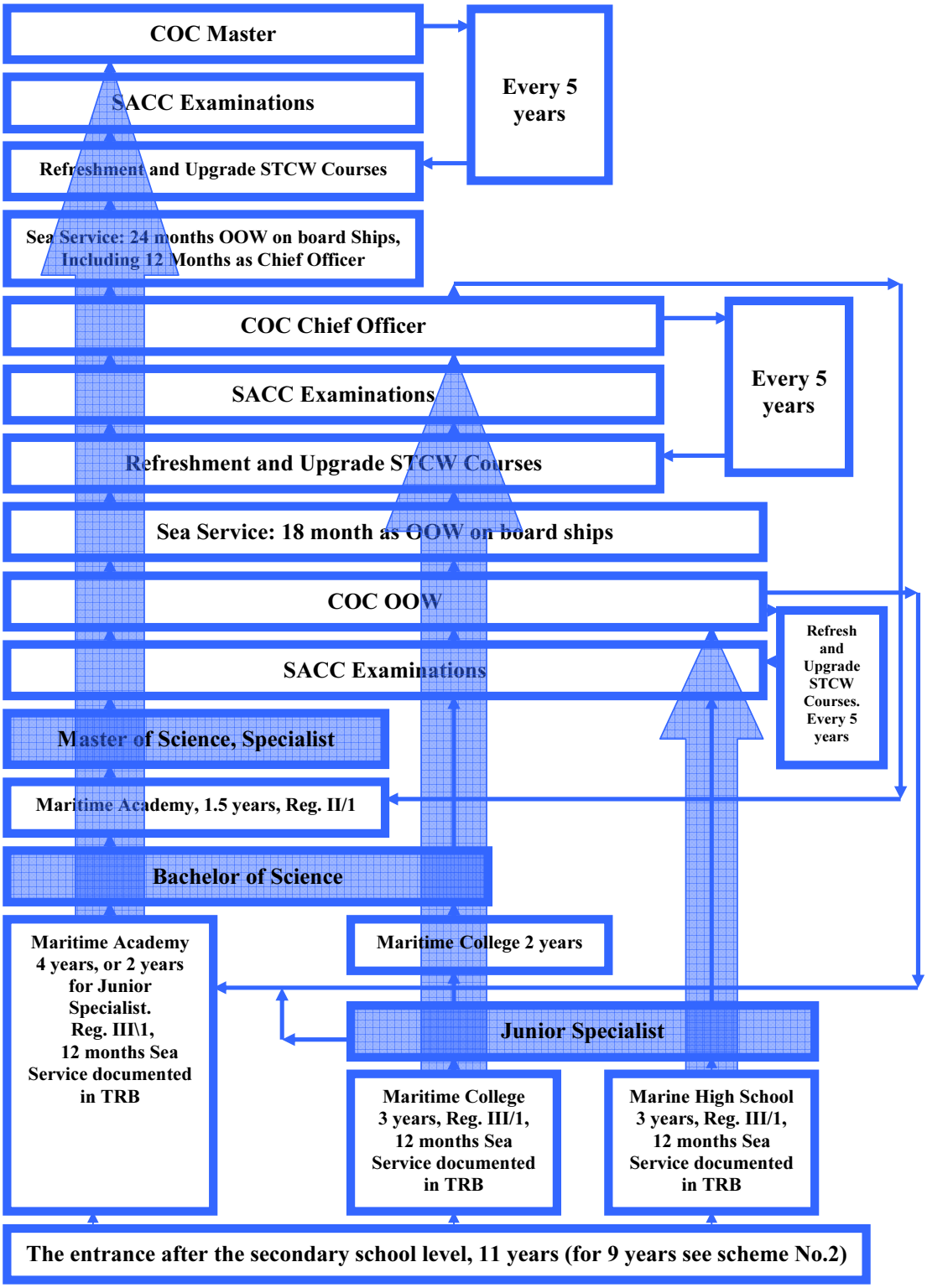
Table 2. List of educational establishments of the 3rd-4th levels of accreditation in **6.070104 "Sea- and river-going transport" direction of training**

##	Institution
1.	Kerch State Maritime Technological University
2.	Kherson State Maritime Institute
3.	Kyiv State Maritime Academy
4.	Odesa National Maritime Academy
5.	Odesa State Maritime University
6.	Sevastopol State Technical University
7.	Ukrainian Maritime Institute (Sevastopol)

The Scheme No.1. The System of Education in Ukraine



The Scheme No.2. The Unlimited Certificates of Competency (Deck) – Referring to the STCW 78/95 and Resolution of the Cabinet of Ministers of Ukraine No 38, 15th of January 2005 - "Regulation on the Conferring the rank upon the Ukrainian Seafarers".



SACC – State Assessment Commission of Competency, OOW - Officer in charge of the Watch, COC – Certificate of Competency, TRB – Training Record Book.

12. General information of the Institution

Name of the Institution: Odesa National Maritime Academy
Rector: **Mykhaylo V. Miyusov**
Address: 8, Didrikhson str., Odesa, 65029, Ukraine
Phone/fax numbers: +380 48 777 57 74
Fax: +380 48 734 52 67
URL: http://www.onma.edu.ua/
e-mail:info@onma.edu.ua

Odesa, one of the greatest industrial, scientific and cultural centres of Ukraine, is the maritime capital of Ukraine. The Odesa National Maritime Academy is the leading higher educational centre in the country, which trains officers in all maritime specialties for sea-going, river and fishing fleet. It plays a special role in the life of the city. The Odesa National Maritime Academy is well-known for a long time in the world of marine shipping due to its 45 000 highly qualified specialists, its graduates, who work in hundreds of shipping companies all over the world and also because of its high rating among leading maritime institutions due to accreditation of specialities of the Academy by the Institute of Marine Engineering, Science and Technology, and the Nautical Institute (Great Britain), its membership in the International Association of Maritime Universities, active participation of scientists and teachers at the authoritative forums, which are held by the U.N. International Maritime Organization, and by world's leading maritime, educational and scientific institutions. With every oncoming year more and more shipping owners of Great Britain, Germany, Greece, the Netherlands and other European countries give preference to Ukrainian seafarers and first of all to the graduates of the Academy.

For years of Independence of Ukraine the Odesa Maritime Academy hasn't only yield to its positions taken before but founded new institutions, faculties, specialties, the basic Training and Certification Centre in Ukraine equipped with modern simulators where Ukrainian and foreign shipping specialists undergo training and upgrading courses to improve their qualification.

Nowadays the Academy is the leading scientific and methodological center which defines philosophy, objectives and ways of improving maritime education in Ukraine and in the world.

About 13000 cadets study at Odesa National Maritime Academy. The annual graduation is about 1, 500 specialists.

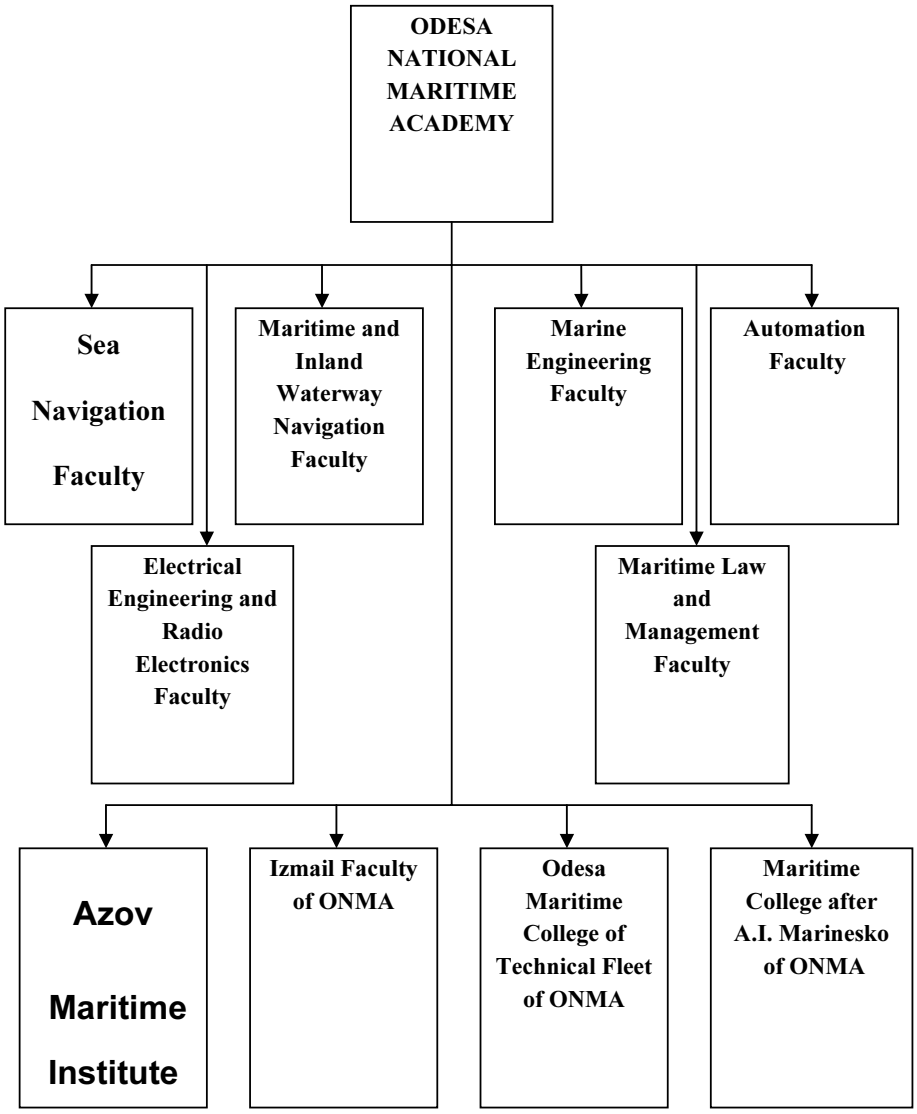
The Academy was accredited by the State Board of Ukraine with accreditation level IV (highest).

The studies are carried out according to the graded system. The terms of studies are the following: four years for Bachelor's of Sciences degree and one more year and a half for Specialist's or Master of Science degree.

The system of ship’s crew training is in compliance with the requirements of the International Convention of Training and Certifying of Seafarers and Watchkeeping (STCW-78/95) and other international conventions which give graduates the right to work on all types of vessels of native and foreign companies.

3. Structure of the Institution

ONMA comprises of the following faculties and branches:



Sea Navigation Faculty

Specialty: "Navigation"

Specialization**:** "Deep-Sea Navigation", "Cargo transportation, Chartering and Agency Service"

The profession of a navigator is extremely crucial on board a ship; it requires comprehensive education. Navigators' service has always been a synthesis of knowledge of numerous fundamental sciences and modern technologies.

Future navigators' training course includes English Language, Navigation, Pilotage, Nautical Astronomy, Ship's Construction, Maritime International Law, Ship's Control, Economics, Management of Fleet and Cargo Transportation Technology, Commercial Operation of a Vessel and some other disciplines, which form knowledge and skills, necessary for a future leader.

The curriculum makes a provision of shipboard training on board sea going ships, which is 12 months long. After four years of studies a cadet is granted a Bachelor's of Sciences degree (diploma), an international certificate of competency and all necessary certificates, required for performing the duties of an officer in charge of a navigational watch.
Graduates having Bachelor's of Sciences degree may go on with their studies up to the level of a specialist or a Master of Sciences. The term of studies is 1.5 years. The certificate of Specialist or Master of sciences allows professional growth up to the rank of deep sea captain.
The graduates of the faculty work successfully both on board sea-going ships and in many branches of the industry, as well as at many management positions.

Maritime and Inland Waterway Navigation Faculty
Specialty: “Navigation”
Specializations: “Navigation on Sea and Inland Water Ways”, “Sea-going Hydrographic Ship’s Navigation”, “Technical Service Ship’s Navigation and Dredging Operations”.

The faculty was established in 1993 on the basis of Deep-Sea Navigation Faculty. Since 1975 a trend towards fleet specialization has become wider. The development of European inland waterways as well as improvement of cargo transportation have caused a desperate need in navigators who specialize in "Navigation on Sea and Inland Water Ways".
Since 1999 navigators-dredger operators have also been trained. The candidates who have completed Odesa Maritime College of Technical Fleet of ONMA are accepted to continue their education. During their studies cadets have practical training on modern navigational simulators in Meteorology, Navigation and Sailing Directions, Hydrography and Sea Geology Laboratories.
The faculty includes the following departments: Navigation on Sea and Inner Water Ways, Hydrography and Sea Geodesy, Theory and Ship's Construction, the English Language in Hydrography and Sea Radio Communication, Safety and Security at Sea.
The graduates can occupy the position of navigators on seagoing ships without any limitations as well as in compliance with the obtained specialization: on river vessels or mixed "river-sea" type, technical service vessels, hydrographic and research ships.
They can also work at the enterprises of the appropriate field.

Marine Engineering Faculty
Specialty: “Ship’s Power Plants Operation”
Specializations: “Ship’s Power Plants Operation”, “Ship’s Power and Refrigerating Plants Operation”.

The Engineering faculty has been functioning since the Academy was founded. Nowadays this faculty is a powerful educational and scientific complex, capable of training highly-qualified ship's engineers. The level of these engineers complies with international requirements. It is provided by highly-qualified teaching staff. There are 28 laboratories, up-to-date, and equipped with facilities and simulators at this faculty.
The faculty trains: bachelors of ships' power engineering, the term of studies - 4 years; specialists in control of ships' power plants, the term of studies - 1,5 years; masters of ships' power plants, the term of stadies - 1,5 years.
The Engineering faculty includes the following departments: Fleet Operation and Maintenance; Ship's Power Plants; Ship's Refrigerating and Auxiliary Plants and Systems and their Operation; Ship's Heat-power Engineering; Safety of Life at Sea; Theoretical Mechanics; Technology of Materials and Ship's Repairs; English Language in Ships` Engineering.
Highly qualified teachers, engineers, instructors, the majority of which have practical maritime experience work at chairs, laboratories, and training centres. More than 60% of teachers have academic degrees of candidates and doctors of science and academic titles of assistant professors and professors.

Teachers and post-graduates of the faculty conduct research work dealing with the promotion of ships' power plants control efficiency, the results of which are published in collected articles "Ships' Power Plants", accredited by Higher Accreditation Committee. 3-4 Ph. D. theses are defended at the faculty annually. Graduates of this faculty can work as ship's universal engineers of all levels and on all types of vessels. They can operate and maintain power plants of different capacity. They can work at shipyards on offshore rigs; at shipping companies; at developing and scientific organizations; at appropriate higher educational institutions.

Automation Faculty
Specialty: “Automated Control of Technological Processes”
Specialization: “Automated Control of Ship’s Power Plants”.

Automation Faculty has started its activity in 1965. Its formation was caused by reinforcements of the fleet with highly automation vessels. For marine engineers of universal education the knowledge of automation units and technological processes was of great value. Over recent years in connection with the rapid development of computer-integrated technologies, with the requirements on safe navigation and environmental protection the curricula have been developed and modern full-scale simulators of automated ship’s power plants have been installed at the Faculty, which enables it to proceed to new forms of specialists’ training. At the Faculty there is a marine simulation center of ships’ power plants, which provides refresher courses for marine engineers and electrical engineers for work on automation ships according to three programmes: ships’ power plants control; ships’ power plants operation; ships’ engine room crew management. There is a center of special technologies on ships maintenance organization. Graduates have the right to occupy managing positions of marine engineers of all levels on the world merchant fleet vessels mostly with high level of automation, to work at ship repair yards, at shipping companies’ divisions, at designing and scientific organizations, at higher educational institution.

Electrical Engineering and Radio Electronics Faculty
Specialty: “Electric Systems and Complexes of Transport Means”
Specialization: “Operation and Maintenance of Ship’s Automated Systems”
Specialty: “Radio-electronic Appliances, Systems and Complexes”.

The Faculty was formed in 2003 on the basis of Electrical Engineering Faculty (founded in 1944) and the Faculty of Radio Electronics (founded in 1991).
This integration helped to concentrate powerful scientific, educational and technical resources within one structural unit, to increase the efficiency of cadets' training in the field of ships' electrical equipment, electronic devices and control systems, maritime radio communicational and navigational systems.
Training standards of specialists in "Electrical Systems and Complexes of Transport Means" take into account the growth of ships' power equipment, increase of the number of electrically-propelled ships, modern evolution level of electric automatics and computerized control technologies. Graduates of this speciality are multifunctional ships specialists. They are able to operate effectively not only electrical equipment and automatic systems, but also a ship power plant.
The graduates get the "III class electrical engineer" certificate and international certificate of officer in charge of an engineering watch according to the STCW Code Requirements.
Training standards of specialists in "Radio Electronic Devices, Systems and Complexes" meet the requirements of modern progress in radio Electronics, terrestrial and satellite communication and navigational systems, and computer techniques. Cadets obtain thorough knowledge in modern digital communication technology, wireless land area networks (WLAN) and mobile communication.
The graduates get international Radio Electronic's certificate according to the STCW Code Requirements. The Faculty possesses modern simulator facilities, with which the cadets undergo their training.

The departments incorporated into the Faculty are the following: Higher Mathematics; Principles of Ship's Electric Power Engineering; Ships' Electrical Machines and Automatically Controlled Drives; Ships' Electrical Equipment and Automation; Maritime Radio Communication; Fundamentals of Radio Engineering. The graduates majoring in their specific fields are employed on vessels as marine electrical engineers and radio engineers.
They also work at ship-repairing yards and for shipping companies, in on-shore radio centres, ports, scientific research institutes, telecommunication companies, designing organizations and higher educational establishments.

Maritime Law Faculty
Specialty**:** "Jurisprudence"; Specialization**:** "Maritime Law"
Specialty: "Management of Organization"; Specialization: "Management of Maritime Transportation Organizations".

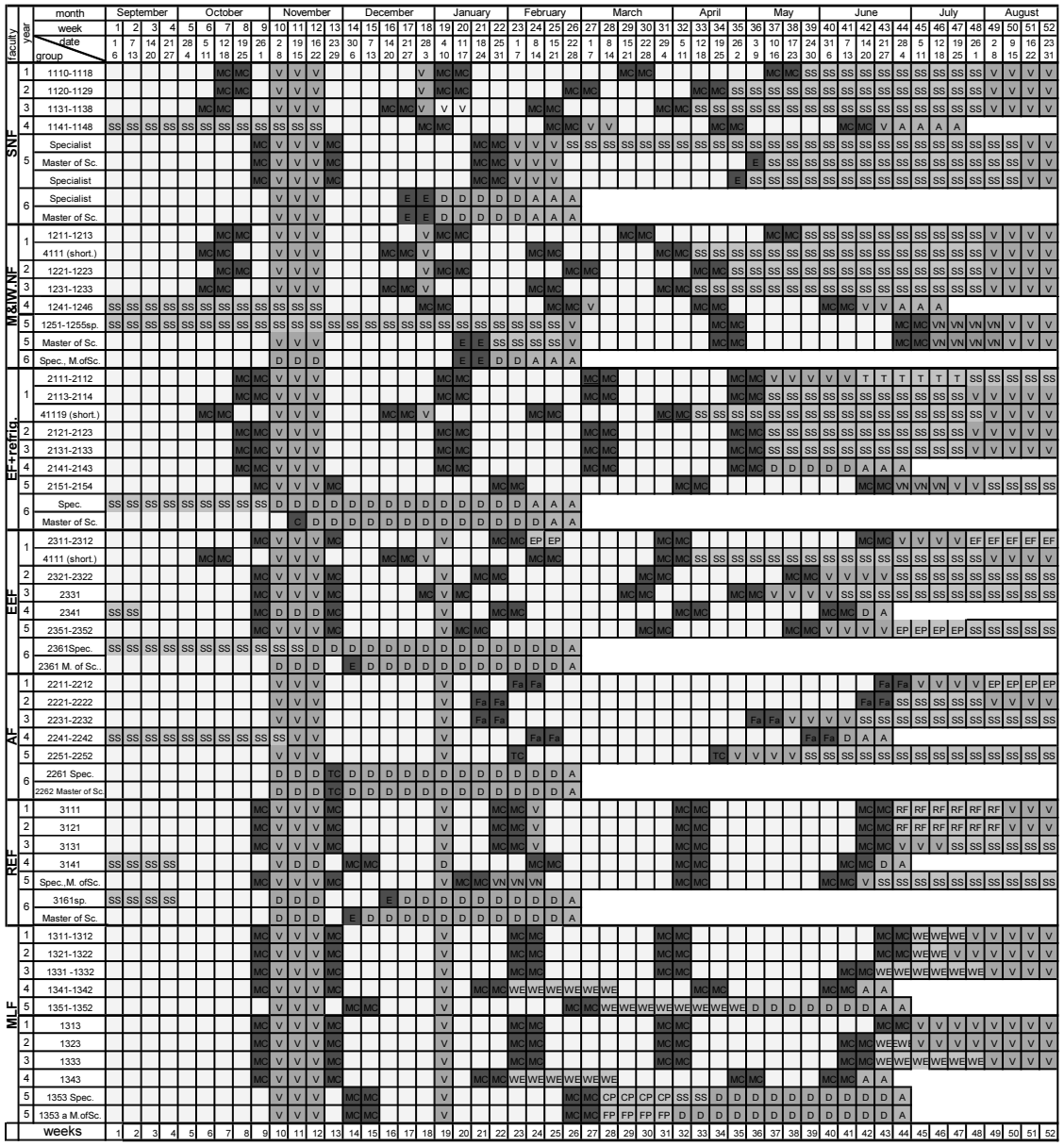
According to the licenses and the certificate of accreditation there are such Specialities as: Jurisprudence, Management, Specializations: Maritime Law, Management of Sea Transportation Organizations. The maritime law and management faculty prepares maritime lawyers and managers of organizations of maritime transportation. The first admission into the specialty "Jurisprudence" and specialization "Maritime Law" took place in 1995. "Management of Organizations of Sea Transportation" accepted the first students in 2004.
The faculty consists of 8 departments: Administrative and Criminal Law, Civil and Labour Law, Management and Economic of Maritime Transport, Economic Theory and Business Undertakings on Sea Transport, Maritime Law, the Ukrainian Culture and Language, Physical Education and Philosophy. The high level of professional education of cadets is carried out by teachers of the highest qualification - professors and associate professors.
Teaching staff takes part in developing maritime legislation and economic programs of improving the development in Ukraine. They also represent Academy in the work of the Assembly of International Maritime Organization and its committees, and also in the international economic forums.
The faculty supports the partnership relations with the corresponding departments of maritime law and economic universities of Belgium, Bulgaria, Portugal, Russia, Ukraine, etc. Training of specialists is carried out according to the curriculum and the programs of disciplines, based on the demands of the International Conventions.

13. Sructure of Programs(Topics/Hours/OBT)

Approved
by First-Deputy Rector ONMA

O.M. Shemyakin

SCHEDULE
of education process for year 2009/2010 Full-time education
enforced by the Decision of ONMA Scientific Council by Proceedings № 4 dated "26" November 2009



V Vacations | VN Vacation&Navy Training | D Diploma work | A State attestation | MC Module Control | E Examination | FA Final attestation | TC Term control

SS Sea service | WP Work practice | WE Work experience | EP Engineer Practice | EF El. And Fitting Practice | FP Field practice | CP Complex Practice | RF Radio and Fitting Practice

The Head of Educational Department M.M. Parkhomenko

14. Training ship.

Sailing Training Ship "***DRUZHBA***" ("FRIENDSHIP") is a sister ship of the Polish sailing training ship designed "***Dar Młodzieży***, launched in 1987 in the Gdańsk shipyard, Poland. Its home port is Odessa.

Specifications:

- Length: 108,815 m (including bowsprit)
- Width: 14 m
- Height: 62.1 m
- Depth: 6.3 m
- Sail surface: 3015 mI
- Crew: 104 persons (40 crew and 64 cadets)

15. OBT Scheme

In compliance with STCW - 78/95 requirements (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995, Chapter A - II/1 - Master and Deck Department; A - III - (1 - Engine Department, A-IV/2 – Radio Communication and Radio Personnel), all cadets undergo their shipboard training during the process of education. Navigation cadets require minimum of 12 months' seagoing service, other cadets - 8 months. Besides shipboard training, cadets of engineering faculties have technological training at the Academy's workshops and at ship-repairing yards.
Junior cadets have their shipboard training on the sailing ship "Druzba". Senior cadets pass their seagoing service on board ships of Ukrainian and foreign companies.

6. Academic Personal Database

<table>
<tr><th colspan="5">ACADEMIC PERSONAL DATABASE</th></tr>
<tr><th>FAMILY NAME</th><th>NAME</th><th>DEGREE</th><th>MARITIME LICENSE</th><th>ACADEMIC POSITION</th></tr>
<tr><td>ZHUKOV</td><td>DMYTRO</td><td></td><td>Master Mariner</td><td>Senior Lecturer</td></tr>
<tr><td rowspan="5">TEL. +380487311059
FAX +380487311059
MOBILE
+380674831633
EMAIL
d_zhukov@mail.ru
ADDRESS: Odesa National Maritime Academy,
8, Didrikhson str.,
Odesa, 65029, Ukraine</td><td>LANGUAGE</td><td colspan="3">SPECIALITIES</td></tr>
<tr><td>1. Russian
2. English
3. Ukrainian</td><td colspan="3">1. Navigation
2. Ship handling
3. Maritime safety and Security</td></tr>
<tr><td colspan="2">RESEARCH INTERESTS</td><td colspan="2">TEACHING SPECIALITIES</td></tr>
<tr><td colspan="2">1. Academic maritime education
2. Ship handling
3. Effectiveness of Maritime Teaching</td><td colspan="2">1. Navigation
2. Ship handling
3. Maritime safety and Security</td></tr>
<tr><td colspan="5">PUBLICATIONS (5 ONLY AFTER 2005)</td></tr>
<tr><td colspan="5">1.“The methodological principles of the deck officers training and management of the training process”, St. Petersburg 2009

2.“On-board training and Experienced Officers”, CMA San Francisco 2008

3.“ ON THE RISK ASSESSMENT AND DECISION MAKING WHILE CONTROLLING THE SHIP IN ADVERSE WEATHER CONDITIONS”,CMA San Francisco 2008</td></tr>
</table>

1. National system of the education and MET in the Republic of Croatia

Croatia is a southern Central European. It borders with Slovenia and Hungary to the north, Serbia to the northeast, Bosnia and Herzegovina to the east, and Montenegro to the far southeast. Its southern and western flanks border the Adriatic Sea, and it shares a sea border with Italy and Slovenia in the north and with Montenegro on the south. Its mainland territory is split in two non-contiguous parts by the short coastline of Bosnia and Herzegovina, around the small town of Neum. Total length of the Croatian border is 1.982 km which includes 1.246 islands.

Through history, as well nowadays, people of Croatia have a strong connection with sea and with all activities within marine industry. Following aforementioned, MET system in Croatia has been developing for a long time. In 2009 it was 160 years since the establishment of the first nautical school in Croatia in Bakar.

Nowadays it follows international requirements laid down in the IMO STCW convention as well as in the EU educational obligations. The main objectives of such system are:

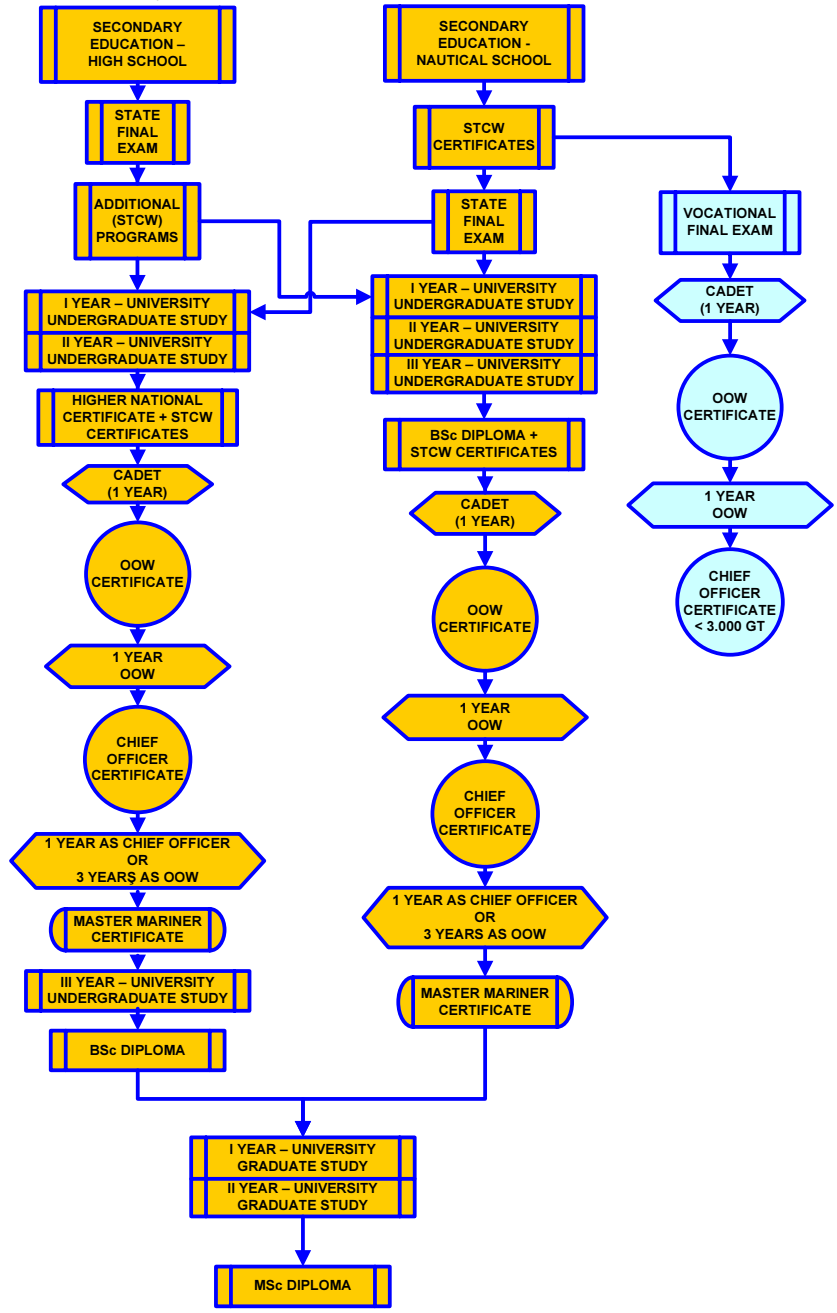
- to maintain highest standards in education, training and certification of seafarers,
- to apply highest standards of safety of navigation as well as highest living and working conditions on board,
- to create motivating environment for seafarer profession.

MET system in Croatia is established through umbrella of the Ministry of the Sea, transport and infrastructure (Administration) as well as Ministry of Science, Education and Sport.

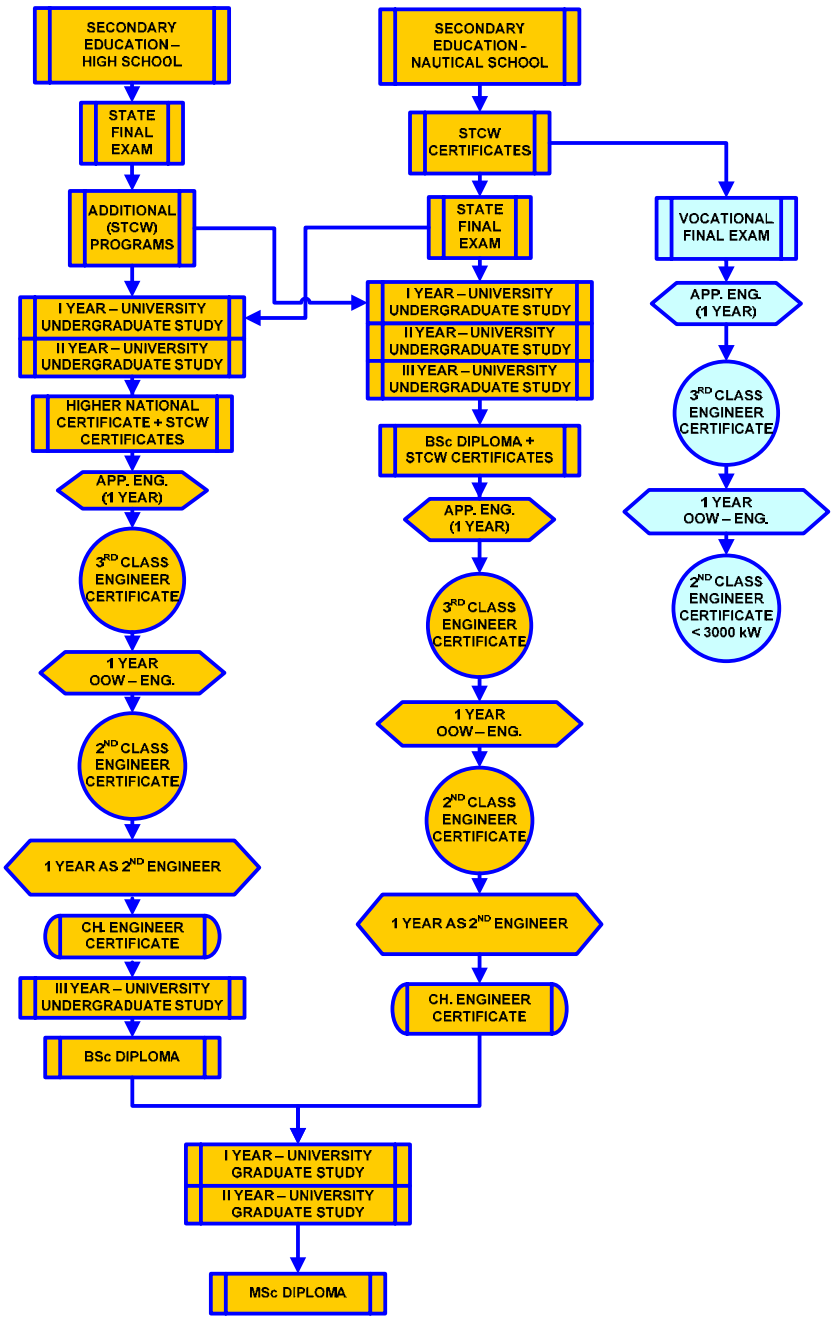
Maritime education is divided into two stages. First stage includes vocational education within nautical schools follows by higher education at the Maritime faculties. Along the Croatian coast there are 6 nautical schools (875 pupils in 2010. have been graduated) and 4 faculties (Rijeka, Zadar, Split and Dubrovnik). In 2009. 327 pupils have been graduated at the nautical schools (nautical and engineering departments) and 281 at the faculties.

MET programs and curriculum are in accordance with STCW requirements, approved by the Administration and the functionality of the system is under constant control. Following graphs present MET system currently established in Croatia.

Nautical MET system



Marine Engineering MET system



2. General information of the institution

Name of the Institution:
University of Rijeka Faculty of Maritime Studies Rijeka

Dean:
Prof. Serđo Kos, Ph. D.

Address:
Studentska 2
51000 Rijeka
Croatia

Phone/ number:
+385 (0)51 211046

Fax number:
+385 (0)51 336755

e-mail:
dekanat@pfri.hr

URL:
http://www.pfri.uniri.hr/

The Faculty of Maritime Studies Rijeka is situated very close to the centre of the town. It can be reached on foot from the railway or the bus station, or from the harbour in a very short time.
Following the process of quality awareness, in 2001 the Faculty gained ISO 9001:2000 certificate of quality issued by the national and international classification societies (Croatian Register of Shipping and Bureau Veritas). Again, in the following years recertification was carried through again.

2.1. History

The Faculty of Maritime Studies, University of Rijeka, was founded in 1949 under the name of the Merchant Marine Training College of Rijeka. It was the first maritime education and training institution of higher education in Croatia.
In 1978 the College was transformed into the Faculty of Maritime Studies and joined the University of Rijeka, offering both diploma and B.Sc courses in maritime and transport studies. Since 1982 the Faculty has run M.Sc and PhD courses in maritime and transport studies.

2.2. Mission - principal objectives

1. Maritime education & training:
   - MET of marine officers under STCW 1995 Convention
   - opportunity for maritime officers to achieve academic degree
   - education and training of academically and vocationally qualified personnel for the management level in:
     -maritime administration, coastguard & harbormaster's offices
     -shipping companies, ports and ports authorities, shipbuilding and port industry
     -shipping & forwarding agencies
     -logistics of maritime transportation
     -protection of the marine environment
     -inland waterways operation & administration, land and intermodal transportation
2. Projects and feasibility studies for the Croatian Maritime Administration, shipping industry, ports, etc.
3. R & D in the maritime industry

The Faculty of Maritime Studies is recognized for high quality teaching and research. It is committed to achieving standards of excellence. The Faculty stands to the national code of good teaching in maritime education and training institutions. Over the last fifty-five years the Faculty has been involved in curriculum reforms following advances in theory and practice. The Faculty of Maritime Studies' programmes are confirmed by the rigorous process of external accreditation.

2.3. Structure of the Institution

Departments

- Navigation and Nautical Studies
- Marine Engineering and Ship Power Systems
- Marine Electronics and Communications
- Maritime Transportation
- Logistics and Management

- Mathematics and Natural Science
- Maritime Law
- Foreign Languages
- Social Studies and the Humanities

2.4. Teaching Staff

Full Professor	14
Associate Professor	7
Assistant Professor	7
Higher Voc. School Professor	5
Senior Lecturer	6
Lecturer	2
Senior Assistant	19
Assistant	2
Researcher	12
Total	**74**
Ph. D.	33
M. Sc.	24
B. Sc.	17

Teaching Staff by name and title

Title	Surname	Name		Title	Surname	Name
M. Sc.	Antonini	Nataša		prof.	Mohorovičić	Sanja
M. Sc.	Ban	Ivoslav		M. Sc.	Mohović	Đani
Ph. D.	Baričević	Hrvoje		Ph. D.	Mohović	Robert
M. Sc.	Bernečić	Dean		M. Sc.	Mrak	Zoran
Ph. D.	Bistričić	Ante		M. Sc.	Miculinić	Rikard
M. Sc.	Bonato	Jasminka		M. Sc	Orović	Josip
B.Sc.	Brčić	David		M. Sc.	Perić Hadžić	Ana
prof.	Brdar	Irena		Ph. D.	Poganj	Tibor
Ph. D.	Bukša	Ante		Ph. D.	Poletan Jugović	Tanja
B.Sc.	Cuculić	Aleksandar		Ph. D.	Pritchard	Boris
Ph. D.	Čišić	Dragan		B. Sc.	Radonja	Radoslav
B. Sc.	Debelić	Borna		B. iur.	Rak	Loris
Ph. D.	Draščić Ban	Bis rka		prof.	Redžić	Albin
prof.	Drljo	Mirjana		prof.	Redžić	Maja
Ph. D.	Dundović	Čedomir		Ph. D.	Rudan	Igor
M. Sc.	Frančić	Vlado		M. Sc.	Rukavina	Biserka
M. Sc.	Glavan	Željko		prof.	Ružička-Matejčić	Vlasta
B.Sc.	Grubišić	Neven		Ph. D.	Sušanj	Josip
B.S .	Gulić	Marko		Ph. D.	Sviličić	Boris
Ph. D.	Hess	Mirano		M. Sc.	Šabalja	Đani
Ph. D.	Hess	Svjetlana		B.Sc.	Šantić	Livia
Ph. D.	Ivče	Renato		Ph. D.	Šegulja	Ivica
Ph. D.	Jugović	Alen		M. Sc.	Tijan	Edi
M. Sc.	Jurdana	Irena		Ph. D.	Tireli	Enco
Ph. D.	Kesić	Blanka		Ph. D.	Tomac	Nikola
M. Sc.	Kitarović	Jakov		Ph. D.	Tomas	Vinko
Ph. D.	Knežević	Božana		Ph. D.	Tominac	Sandra
Ph. D.	Kolanović	Ines		Ph. D.	Tudor	Mato
Ph. D.	Koljatić	Vjekoslav		B.Sc.	Valčić	Marko
Ph. D.	Komadina	Pavao		M. Sc.	Valentić	Jadra ka
Ph. D.	Kos	Serđo		M. Sc.	Vilke	Siniša
M. Sc.	Kralj	Predrag		M. Sc.	Vio	Igor
Ph. D.	Kraš	Antun		Ph. D.	Vranić	Duško
Ph. D.	Luttenberger	Axel		Ph. D.	Vučetić	Dubravko
prof.	Luzer	Josip		Ph. D.	Zec	Damir
B.Sc.	Maglić	Lovro		Ph. D.	Zenzerović	Zdenka
B.Sc.	Maksimović	Srđan		B.Sc.	Žuškin	Srđan
Ph. D.	Martinović	Dragan				
M. Sc.	Matković	Milan				

2.5. Students/Cadets total quantity (Academic Year 2009 / 2010)

Courses	Subsidized Student	Self-paid Students	Foreign Stud.	Extramural Students	Total	Women
BSc Degree Courses						
Nautical Science and Safety of Navigation	125	88	0	93	**306**	15
Marine Engineering	118	32	0	65	**215**	11
Marine Electronics and Communications	99	35	1	23	**158**	0
Technology of Transport	100	53	0	28	**181**	116
Logistics and Management	124	101	0	95	**320**	208
MSc Degree Courses						
Nautical Science and Safety of Navigation	20	0	0	13	**33**	4
Marine Engineering and Maritime Transport Technology	6	0	0	4	**10**	0
Marine Electronics and Communications	30	0	0	16	**46**	0
Technology of Transport	24	0	0	2	**26**	14
Logistics and Management	81	0	0	11	**92**	69
TOTAL	**727**	**309**	**1**	**350**	**1387**	**437**

2.6. Training facilities and equipment

The Faculty runs simulators, workshops and specialized classrooms as part of regular and additional courses of training:

Simulators:
Nautical Simulators:

- TRANSAS MARINE NAVI-TRAINER PROFESSIONAL - 4000, full mission bridge navigational simulator with on-screen projection 180 deg.

Engine Room Simulators:

- TRANSAS ERS 4000 ver. 7.3
- Norcontrol DPS 100 Diesel Engine Simulator
- Norcontrol PPT 2000 SIMULATOR
- Norcontrol Cargo handling simulator (oil tankers) GMDSS station

Specialized classrooms (labs, computer facilities, etc.)

- Nautical
- Computer Lab
- Language Lab (PC & video)
- Reefer Lab
- Loadmaster




2.6.1. Navigational simulator- Navi-Trainer Professional 4000 (NTPRO 4000)

Navigational simulator Navi-Trainer Professional 4000 (NTPRO 4000) enables simulator training and certification of watch officers, chief officers, captains and pilots serving on commercial and fishing ships with the gross tonnage of 500 tons and more. This complies with requirements of IMO STCW 78/95 Convention and Model Courses 7.01, 7.03 as well as number of specific tasks beyond the Convention. Simulator incorporated also the Transas GMDSS Simulator, VTS simulator, and possibility of join venture with ERS 4000 simulator.
NTPRO 4000 simulator is certified by DNV as Class A simulator.

Conventional training

- Ship handling training in accordance with STCW'95 requirements (Bridge Team Management, Bridge Resource Management, ARPA/Radar, ECDIS, AIS, …)

Special training

- Ship handling training in ice conditions;
- Training for naval applications;

Vessel traffic management training in accordance with IALA V 103 standard for the certification and training of VTS personnel;

2.6.2. Engine Room Simulators

The Faculty of Maritime Studies has got its primary mission to educate and train students. An essential training segment takes place at engine room simulators. The simulators are designed for training the students for proper skills when operating the ship propulsion plant, preparing and putting into operation machinery and systems; monitor their operation by measured parameters with the aid of the alarm system; trouble shooting; propulsion plant control during vessel maneuvering and etc. In addition to training in practical skills, the simulator allows the students to learn the basic principles of the structure, functions and interaction of propulsion plant components and systems.
The simulator training does not only enable the students to acquire the necessary experience in operation of different propulsion systems, but it also facilitates simulation of numerous virtual situations, thus stimulating the students intellectual creativity and response to any malfunction, error or breakdown they may experience in navigation.

The Faculty of Maritime Studies has got three engine room simulators:

- Norcontrol DPS 100
- Norcontrol PPT 2000
- Transas ERS 4000 ver. 7.3

Norcontrol DPS 100 engine room simulator was installed at the Faculty of Maritime Studies in 1998 and at that time it was the only simulator of that kind in the Mediterranean. It is made up of three compartments: a parameter setting room, the system display room and a computer read-out room of both numeric and graphic data. The simulator classroom capacity is for approximately 10 students.
The simulator composition corresponds to the standard configuration of a 100 000 dwt VLCC tanker. The engine room consists of a slow speed two stroke main propulsion engine type MAN B&W 6 MC 90 with all necessary auxiliary systems: auxiliary steam boiler, exhaust gas boiler, two diesel generators, one turbo generator and one shaft generator. The cargo system consists of three steam turbine driven centrifugal cargo pumps, one steam turbine driven ballast pump and the inert gas system with oxygen control and monitoring system.

Norcontrol PPT 2000 engine room simulator was installed in 2000 year. It is a computer-aided system with one instructor consol and four student consoles. The simulator offers three possible training options (modules): a slow-speed diesel engine propulsion, a diesel-electric propulsion and a crude oil tanker cargo handling system. The optimum simulator classroom capacity is 2 students per console and maximum capacity is 12 students.

Module 1 composition consists of an engine room and cargo handling systems that correspond to the configuration of a 150 000 dwt VLCC tanker. Engine room consists of a five cylinder slow speed diesel main propulsion engine type MAN B&W LMC 90 with auxiliary systems. Module comprises steam generation system with a double pressure D type auxiliary boiler with two burners, exhaust gas boiler, condensate and feed water system. Bridge control, steering gear system and waste heat recovery system are also included in the module. Electrical system comprises two diesel generators, one turbo generator, one shaft generator and 180 kW emergency generator. The cargo system consists of four steam turbine driven centrifugal cargo pumps, one steam turbine driven ballast pump and the inert gas system. Cargo handling system is included in another module.

Module 2 includes simulation of inert gas distribution, cargo and ballast handling systems (loading, discharging, ballasting and deballasting) on the same ship (VLCC tanker). Module also includes stability and stress analysis simulation.

Module 3 includes cruising passenger ship with diesel-electric propulsion with auxiliary systems (4400V/60Hz).




Transas ERS 4000 ver. 7.3 simulator was installed in 2007 year. It is also a computer-aided system with one instructor consol and six student consoles. The simulator offers two possible training options (modules): slow-speed diesel engine propulsion of crude oil tanker and steam propulsion plant for LNG tanker. The maximum capacity for the simulator classroom is 14 students.

Module 1 simulates 65 000 dwt LCC tanker with a MAN B&W 6 S 60 diesel engine and all necessary auxiliary systems. The electrical plant includes main switchboard, two diesel generators, one turbo generator, one shaft generator, an emergency switchboard, a shore supply switchboard and power transformers. Auxiliary plant includes steam plant system, ballast system, bilge water system, steering gear system, water desalination plant, sewage treatment system, incinerator, inert gas system, fire alarm system, foam and CO_2 systems, provision cooling and air conditioning system.

Module 2 simulates 137 585 m^3 LNG tanker with a 29540 kW cross-compound, double reduction geared main propulsion steam turbine type Kawasaki UA – 400. The propulsion plant also includes two Mitsubishi main water tube boilers with dual fuel burners and internal economizers, two turbo generators and one diesel generator. The electrical plant voltage is 6600 V and frequency is 60 Hz. Auxiliary plant is the same as in the module 1.

Both modules include evaluation and assessment system intended for the quantitative assessment of the students' performance during the fulfillment of an exercise.

The Instructor station software consists of three modules:

• On-line class – for teaching and monitoring the execution of exercises by the students;
• Exercise Editor – creating new exercises and editing existing ones;
• Debriefing – viewing and debriefing recorded exercises.

The engine room simulator can also be integrated with NTPro 4000 navigational simulator.

Provision cooling and air conditioning simulators

The Faculty of Maritime Studies also has *Carrier* air conditioning simulator that is used in teaching the basic principles of refrigeration technique and *Elektrolux* provision cooling simulator that is used in later stages in order to familiarize the students with components, control and maintenance of the plant. The *Elektolux* simulator includes standard provision cooling system, cascade cooling system and indirect refrigeration system.

2.7. Maritime Training Centre (MTC)

The Faculty of Maritime Studies Rijeka offers the following sorts of courses for acquiring watchkeeping certificates of competency as per IMO STCW Convention 1978/1995:

- Watchkeeping Courses - STCW 1995
  - Deck Department
  - Engine-room Department
  - Marine Electronics and Maritime Communications
- Supplementary Certificates of Competence (STCW 1995)
- Special-purpose courses other than STCW are also offered at request
- Custom designed courses upon request

The MTC's safety certificates and diplomas are internationally recognized. Only the most highly trained instructors are employed on the courses.
The theoretical part of the courses is taught in Faculty's classrooms equipped with the latest audio-visual aids. Computer-based training sessions use the recent technology. For the practical part, which constitutes by far the larger part of most courses, there is a wide range of up-to-date equipment available, such as a simulators, launching installations for rescue capsules, a free-fall launching tower, various fast boats for rescue operations, etc.

3. Structure of programs

The structure of programmes offers core and elective courses allowing students to materialize in various disciplines. It further contributes to students' employability. Students are thus given the opportunity to use their knowledge and competences in real world applications.

Quality assurance and quality enhancement at the Faculty of Maritime Studies is compatible and comparable with standards in the European system of higher education, the Bologna Declaration, the strategic plans for the development of Croatian maritime industry and with teaching and training in maritime education and training institutions around the world.

The programmes promote establishment of a system of credits, lifelong learning, employability and international competitiveness. The objectives of the Bologna Declaration are thus aterialized.

Teaching methods include lectures, seminars, practical work sessions, group discussions, individual and group presentations, term papers, tutorials, consultation hours and written assignments are key delivery methods of teaching. Lectures are based on current theory and practice and are complemented by practical work sessions, engineering simulators, field training and shipboard training as well as in appropriate cases study analyses.

BSc Degree Courses

- Nautical Studies and Maritime Transport Technology
- Marine Engineering
- Marine Electronics and Communications
- Technology of Transport
- Logistics and Management

MSc Degree Courses

- Nautical Studies and Maritime Transport Technology
- Marine Engineering and Maritime Transport Technology
- Marine Electronics and Communications
- Technology of Transport
- Logistics and Management

Ph.D Degree

3.1. Nautical Studies and Maritime Transport Technology

Aims of the Nautical Studies and Maritime Transport Technology Programme are:

- to promote lifelong training to meet the requirements for certification of marine officers: Chief Mate and Master on ships of 3.000 gross tonnage or more,
- to promote lifelong learning in line with the STCW 1979/95 Convention and the EU METNET projects,
- to raise awareness of the importance of safety at sea and environmental protection,
- to promote quality assurance in maritime education and training institutions (within the system of higher education) in line with the Bologna Declaration, European and world standards of teaching and research,
- to foster scientific approach to the revival of the Croatian maritime economy.

Basic characteristics of the programme are:

- it is comparable and compatible with similar programmes in Europe and around the world,
- the degrees are readable and comparable 'in order to promote European citizens employability and the international competitiveness of the European higher education system' (the Bologna Declaration, 1999),
- it fosters a blend of theory and practice in teaching.

The programme meets the following requirements:

- compatibility with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95 and The Code of Ranks and Certificates for Seafarers' Training on Merchant Ships in the Republic of Croatia (the Official Gazette No. 8/02, 5/03 and 16/03),
- teaching staff with qualifications in line with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95 and The Code of Ranks and Certificates for Seafarers' Training on Merchant Ships in the Republic of Croatia (the Official Gazette No. 8/02, 5/03 and 16/03),
- highest quality standards in terms of premises, classrooms, specialised classrooms, study area, IT, the library and equipment (a navigation simulator and a training vessel),

In conclusion, the first two years of the undergraduate level are in accordance with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95. After the completion of the first and the second year, and upon a documentary evidence of the completed first two years, students are eligible for sea-training, and for taking exams leading to the certificates of competency: Chief Mate and Master of a ship of 3.000 gross tonnage or more. Students earn the national certificates upon the completion of the undergraduate cycles.

3.1.1. Undergraduate study - Nautical studies and maritime transport technology (the first tier - three year study)

I. semester Compulsory courses: Maritime English I, Mathematics I, Engineering mechanics, Applied computer science, Marine electrical engineering, Cargoes carried by sea, Marine meteorology and ocean science, Ship design and construction, Physical training
II. semester Compulsory courses: Maritime English I, Mathematics II, Ship design and construction, Law of the sea and administrative law, Safety at sea, Marine propulsion plants and ship systems, Shipping economics, Marine environment protection, Physical training, Practical seamanship
III. semester Compulsory courses: Maritime English II, Coastal navigation, Electronic navigation, Ship handling, Cargo handling , Ship organization and personal management, Maritime communication, Physical training
IV. semester Compulsory courses: Maritime English II, Shipping law, Astronomical navigation, Cargo handling, Voyage planning, Ship maintenance, Marine medicine, Physical training, On-board training
Optional courses (V. semester): Maritime English III, Mathematics III
Optional courses (VI. Semester): Maritime English III, B.Sc. Essay

Optional courses: Commercial law, Terotechnology, Forwarding and shipping agencies, Trade routes, Carriage of liquid cargoes by sea, Container and ro-ro transport, Ports and Terminals, Transport management, Electronic commerce, Statistics, Transport insurance,
Transport of bulk and special cargo, Passenger transport by sea, Land transport technology,
Economics of maritime systems, Logistics in transport, Automation in transport

3.1.2. Graduate study NAUTICAL STUDIES AND MARITIME TRANSPORT TECHNOLOGY (second tier – two-year programme)

I. Semester**:** Applied mathematics, Research work methodology, Marine technologies
II. Semester: Integrated and multimodal transport, International maritime safety system, Quality management in maritime industry
III. Semester: Modeling and simulations , Coastal zone management
IV. Semester: MSc thesis

Optional courses by module:

MODULE – NAUTICAL SCIENCES: Risk management in shipping, Maritime aspect of ports and waterways design, Marine accidents investigation

MODULE – ECOLOGY OF THE SEA AND MARINE ENVIRONMENT PROTECTION: Ecology of the sea, Environmental law, Pollution control

MODULE – MARITIME INDUSTRY MANAGEMENT: Financing in maritime industry, Business operations in shipping, Chartering

MODULE – TRANSPORT TECHNOLOGY SYSTEMS: Controlling technical systems, Computer management of ship systems, Marine electrical power systems
Optional courses: Operational researches, Human resources management, Project management, Transport law of the EU, Management information systems, Business communications

Optional courses that can be chosen in one of the proposed semester are as follows: Ecology in transport, Strategic marketing and management, International business operations, Supply chain management , Technological processes in transport, Land transport planning, History of navigation, Ship certification and surveying , Ship stability*, Planning of carriage goods by sea, Ship's hydrodynamics, Port and shore structures, Nautical tourism, Port business operation, Business organizations, Customs, Technical systems reliability and safety , Planning and designing transport terminals, Intelligent transport systems.

3.2. Marine Engineering

Aims of the Marine Engineering and Maritime Transport Technology are:

- To educate and train students for highest ranks on board, i.e. for: Second Marine Engineer Officer and Chief Engineer on board ships of 3.000 kW output or more, for Croatian and world shipping market;
- to raise awareness of the importance of safety of life at sea and environmental protection in the system of continuous education and training scheme;
- to foster scientific approach to the revival of the Croatian maritime economy.
- to promote quality assurance in maritime training institutions (within the system of higher education) in line with the Bologna Declaration, European and world standards of teaching and research;
- to promote lifelong learning in line with the STCW 1979/95 Convention and EU METNET projects

Basic characteristics of the programme are:

- it is comparable and compatible with similar programmes in Europe and around the world,
- the degrees are readable and comparable,
- it fosters a blend of theory and practice in teaching.

Courses in the first two years are in line with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95. They provide sound knowledge and competence for the certificates of competency: Second Marine Engineer and Chief Engineer of a ship of 3.000 kW output or more.

The undergraduate programme is confirmed by the rigorous process of external assessment. It must be granted accreditation by the Ministry of Science, Education and Sport, National Council for Higher Education, and the Ministry of Sea, Tourism, Transport and Development. The programme meets the following requirements:

- compatibility with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95 and The Code of Ranks and Certificates for Seafarers' Training on Merchant Ships in the Republic of Croatia (Official Gazette No. 8/02, 5/03 and 16/03),
- teaching staff with qualifications in line with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95 and The Code of Ranks and Certificates for Seafarers' Training on Merchant Ships in the Republic of Croatia (Official Gazette No. 8/02, 5/03 and 16/03),
- highest quality standards in terms of premises, classrooms, specialised classrooms, study area, IT, the library and equipment (marine engineering simulator, refrigeration plant simulator, computer-aided marine engineering plant simulator, load master and steam plant simulator),
- ISO 9001:2000 certificate of quality standards. The certificate is recognised by the Ministry of Sea, Tourism, Transport and Development.

In conclusion, the first two years of the undergraduate level are in accordance with the Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 78/95. After the completion of the first and the second year, and upon a documentary evidence of the completed first two years, students are eligible for sea-training, and for taking exams leading to the certificates of competency: Second Marine Engineer and Chief Engineer of a ship of 3.000 kW output or more. Students earn the certificates upon the completion of the undergraduate cycles.

4. Training ships

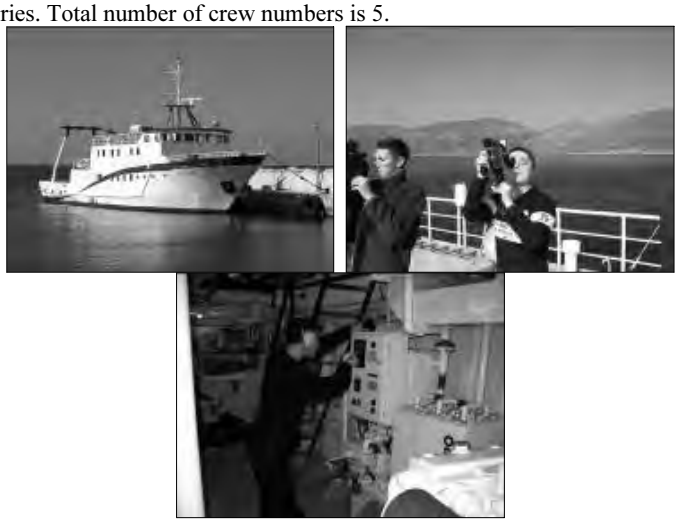
4.1. School ship - "Kraljica mora"

The school ship, named "Kraljica mora" (The Sea Queen), was launched in Vela Luka on Korčula Island on 13th November 2009. The ship was built at the local "Montmontaza Greben" shipyard. It is the first school ship made in Croatia that has been financed in total by the state budget.
The ship project was initiated by Zagreb's "Brodarski Institute" (Shipping Institute), a development and technological institution for the Ministry of the Sea, Transport and Infrastructure.

General particulars:
Flag: Croatia [HR]
Call Sign: 9AA6962
IMO: 9569358
MMSI: 238261000
Owner: Ministry of the Sea, Transport and Infrastructure
Ship type: Loger
Speed recorded (Max / Average): 11.5 / 10.7 knots
Length: 35 m
Breadth: 8.55 m 8
Draught: 2.8 m
Capacity: 28 students, 4 professors and 7 crew members.
Gross Tonnage: 296 GT
Net Tonnage: 88 NT
Displacement: 378,00 t
Length Overall: 35.00 m
Height: 36.30
Materijal: Steel
Sail area: cca 840,00 m2
Main engine: 2 x 373 kW at 1800 t/min

4.2. School ship "NAŠE MORE"

The owner of the research school-ship "Naše More" is the Government of the Republic of Croatia, but the ship is under the management and use of the University of Dubrovnik. The ship was built in 1991 and reconstructed in 2000.
The school-ship is in the use of the lecturers and students of Maritime Studies at the University of Dubrovnik, the Maritime Faculty of Split and the Maritime Faculty of Rijeka for training and research purposes.
A number of other research teams from Croatia, Europe and the USA take part in research projects. The design of the ship for training and scientific research and the fact that it is under the management of the University of Dubrovnik serve as a guarantee that she will be, as she has been so far, at the disposal of all maritime faculties in Croatia and of scientists, but the greatest beneficiaries will be graduates and young researchers.
The ship is equipped with the following equipment and installations: radar, sonar, two echo-sonars, GPS (satellite navigator), steering gear and steering, control cantilever. Deck research gear include trawler winch, small oceanographic winch, big oceanographic winch, A – davit. Engine room gear include four-stroke propelling Diesel engine "Wartsila" with 12 cylinders, reduction gear ring (4.91 : 1), fixed four-bladed bronze propeller; stern and bow thruster propellers, 2 Diesel generators "Iveco" of 100 kVA each. Auxiliary units include air-conditioning, unit for potable water production (osmosis desalination unit), waste water- processing unit, and bilge water separator.
Capacity of the ship is 19 berths for students on practice and lecture cabins and laboratories. Total number of crew numbers is 5.



4.3. Passenger ship owned by "JADROLINIJA" company – particulars

Length: 128,13 m
Breadth: 19,62 m
Height: 12,20 m
Draught: 5,73 m
Speed recorded: 19,50 knots
GT: 10154
NT: 4730
Max. height: 4,20 m
Max. breadth: 4,30 m
Passenger capacity: 1000 persons
Vehicles capacity: 270

5. OBT Scheme (on-board-training)

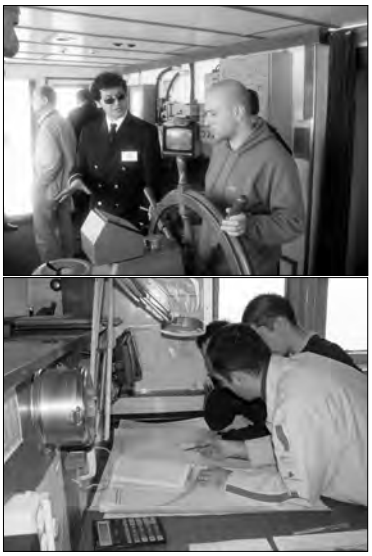
In compliance with STCW – 78/95 requirements (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995, Chapter A – II/1 – Master and Deck Department; A – III – (1 – Engine Department, A–IV/2 – Radio Communication and Radio Personnel), all cadets undergo their shipboard training during the process of education.

At the Faculty of Maritime Studies in Rijeka, both navigation and marine engineering cadets have courses in the first two years during which they undergo approximately 1 month of seagoing experience on the school ships:

- "KRALJICA MORA"
- "NAŠE MORE"
- Passenger ships owned by national passenger liner JADROLINIJA".

Besides shipboard training, marine engineering cadets have training at the Faculty's workshop and at ship-repairing yards:

- "3. Maj", Rijeka
- "Viktor Lenac", Kostrena
- "Kraljevica", Kraljevica.



5.2.12 Proposed format of the collecting information

1. GENERAL INFORMATION OF THE INSTITUTION
2. NATIONAL SYSTEM OF THE EDUCATION AND MET
3. ACADEMIC MARITIME EDUCATION
4. NON – ACADEMIC MARITIME EDUCATION
5. STRUCTURE OF INSTITUTION
6. DIFFERENCES IN NATIONAL MARITIME UNIVERSITIES IF ANY
7. STATISTICS OF NATIONAL MET
8. TRAINING SHIP
9. STRUCTURE OF MARITIME PROGRAMS
10. OBT SCHEME
11. ACADEMIC PERSONAL DATABASE

International Association of Maritime Universities

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