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**WORLD MARITIME UNIVERSITY**  
**MALMÖ, SWEDEN**

**THE DEVELOPMENT OF FURTHER PROGRAMS  
FOR A MARITIME GRADUATE SCHOOL IN  
THE PHILIPPINES**

by

**VALENTINO HIDALGO FERRE**  
REPUBLIC OF THE PHILIPPINES

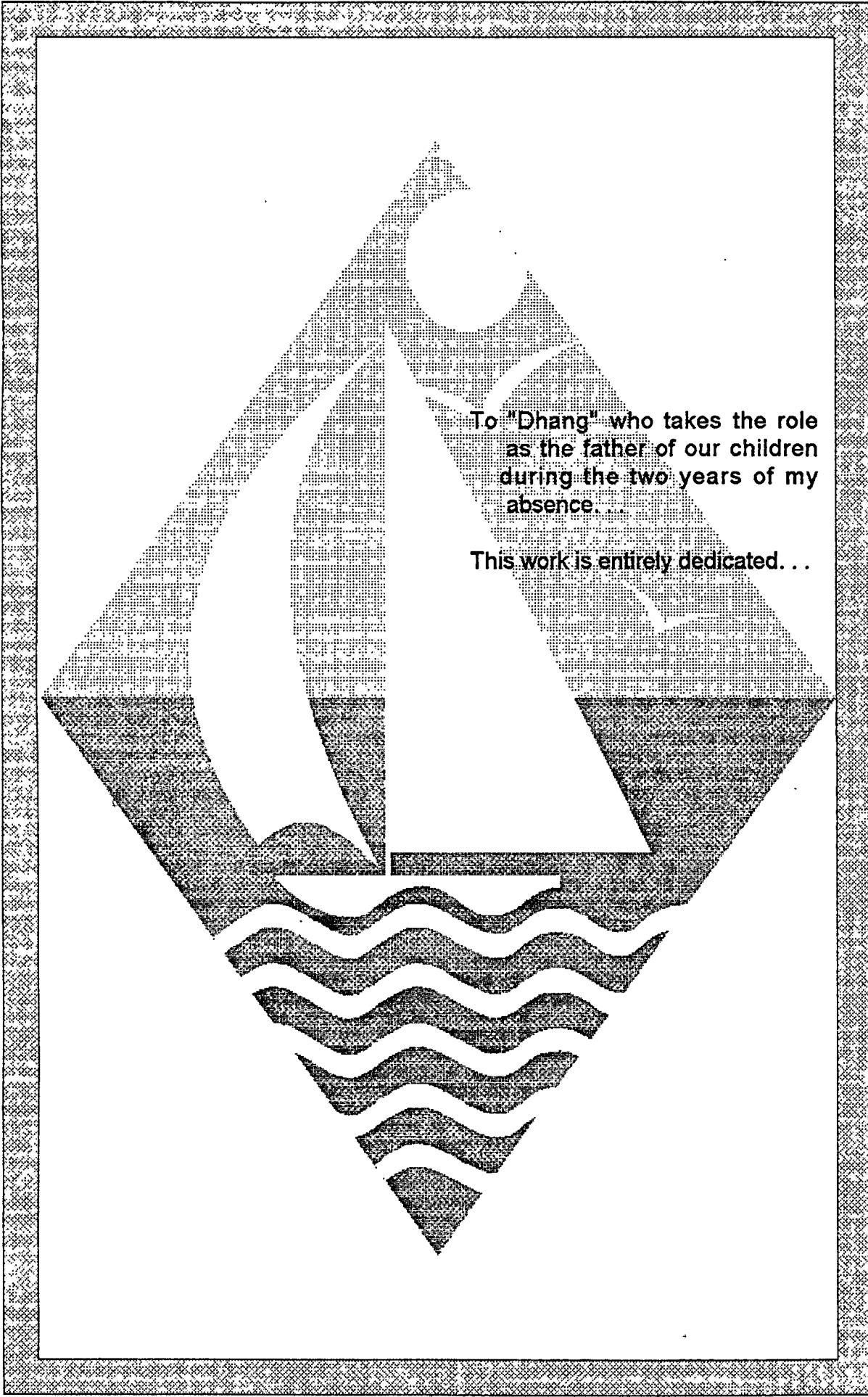
**A dissertation submitted to the World Maritime University in partial  
fulfilment of the requirements for the award of the degree of**

**Master of Science**

in

**Maritime Education and Training  
(Nautical)**

**1994**

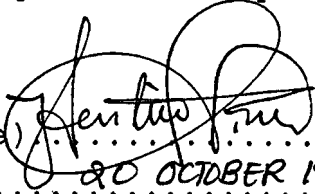


To "Dhang" who takes the role  
as the father of our children  
during the two years of my  
absence...

This work is entirely dedicated...

I certify that all material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has been previously conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature)  .....  
(Date)..... 20 OCTOBER 1994

Supervised by:



Professor Peter M. Muirhead  
InMarsat Professor of MET  
World Maritime University

Assessed by:

Captain Ron D. Vardon  
Head, Department of Maritime Transport  
Singapore Polytechnic

Co-Assessed by:

Dr. Darrell Fisher  
Associate Professor  
Curtin University, Western Australia

## ACKNOWLEDGEMENT

When I first thought of making this dissertation, I knew that there were many difficulties that lay ahead. In the same manner when the ship traverses the vastness of the ocean where she is pounded by forces of winds and waves, without the guidance of the man in the helm the ship will not reach its destination.

Now that the task is achieved it is time to pay tribute to the persons and organization to whom I am in debt for much of the success of my dissertation.

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Without your guidance support and inspiration this dissertation would not have been made possible.

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## ABSTRACT

This dissertation investigates the Maritime Safety Administration in the Philippines with a view to identifying weaknesses in the enforcement and implementation of maritime safety rules and regulations. Highlighted in this dissertation is the need for higher levels of safety as a result of past maritime casualties that have occurred in Philippine waters.

The curriculum structure of the post graduate programs at Philippine Merchant Marine Academy is examined and the capability of offering new courses is evaluated.

Two internationally recognized maritime institutions have been studied, and their curriculum structures evaluated with a view to seeking new programs and ideas to deal with the weaknesses of the education and training of the Philippine maritime safety personnel.

A study has been made of the needs of the Philippine Government for specialist maritime safety personnel and the problems arising from the identified.

Based on the results of the study, the post graduate programs in Maritime Safety Surveying and Maritime Safety Administration have been developed.

Finally, a number of conclusions are drawn and recommendations for the implementation of the programs at PMMA are laid down.

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## LIST OF ABBREVIATIONS

AMC	Australian Maritime College
ANC	Aids to Navigation
BSME	Bachelor of Science in Marine Engineering
BSMT	Bachelor of Science in Maritime Transportation
CCH	Class Contact Hours
CCI	Conditional Certificate of Inspection
CDG	Carl Duisberg Gesellschaft
CGA	Cumulative Grade Average
CGD	Coast Guard District
CGS	Coast Guard Station
CI	Certificate of Inspection
DECS	Department of Education Culture and Sports
DOTC	Department of Transportation and Communication
GMAEP	General Maritime Administration and Environment Protection
GRT	Gross Registered Tonnage
IELP	Intensive English Language Program
IMO	International Maritime Organization
MARAD	Maritime Administration
MARINA	Maritime Industry Authority
MARLEN	Maritime Law Enforcement
MARPOL	Maritime Environmental Protection
MAROPS	Maritime Operations
MARSAR	Maritime Search and Rescue
MSAE	Maritime Safety Administration (Engineering)
MSAN	Maritime Safety Administration (Nautical)
MSc	Master of Science
MSE	Maritime Safety Engineer
MSO	Maritime Safety Office
MSS	Maritime Safety Surveying
NOCOP	National Operation Center for Oil Pollution
PCG	Philippine Coast Guard

PM	Port Management
PMMA	Philippine Merchant Marine Academy
PMMRR	Philippine Merchant Marine Rules and Regulations
PN	Philippine Navy
PSC	Port State Control
SHIPDECO	Shipping Development Company
SM	Shipping Management
SOLAS	Safety of Life at Sea
SPRU	Seamans' Processing and Review Unit
STCW	Standards of Training Certification and Watchkeeping for Seafarers
TOEFL	Test of English as a Foreign Language
UN	United Nations
UNDP	United Nation Development Program

# CHAPTER 1

## INTRODUCTION

The Philippines archipelago is composed of 7000 islands, this being the reason why water transportation is one of the most important modes. Commercial shipping in the Philippines has an important role to play in the economic growth and development of the country. Ships of different types and classes trade between islands to ferry cargo and passengers on a regular basis. In general, there is a significant increase in the demand for passenger and cargo services in the Philippines. Inter-island vessels alone calling at different ports of the country number about 21,618 vessels; big and small, old and new serving the nation. Foreign vessels calling at Philippine ports average about 3000 vessels per year. These vessels have to traverse the Philippine waters characterized by narrow rivers, lakes and shallow sealanes. Weather conditions most of the time are not favourable due to the geographical location of the country which is in a typhoon belt area.

Considering the above, the responsibility to maintain the safety of the vessels, passengers and crew at all times is a very demanding task. The Philippine Coast Guard (PCG) being the maritime safety administration of the Philippines has the responsibility to promote safety of life at sea and for the preservation of the marine environment. In the exercise of its power, the PCG formulates, enforces and implements applicable maritime safety rules and regulations consistent with the

country's existing laws. The PCG has Districts and Stations covering the whole archipelago to fully enforce and implement maritime safety rules and regulations.

Maritime accidents and casualties in the Philippines are significant. Statistics show that from 1982-1990 around 2,017 maritime accidents occurred in the Philippine waters and around 20,700 people were involved in maritime casualties. The reason for this is the unsatisfactory condition of the Philippine domestic fleet. Most of these vessels are navigating in an unseaworthy condition despite of substantial rules and regulations covering safety of vessels, passengers and crew. Over the past few years, the PCG has been the subject of public criticism. The capability of its maritime safety personnel to enforce and implement rules and regulations has been ridiculed by many as inefficient.

On the other hand, the training and education of personnel whether shorebased or seabased lies within the scope of maritime institutions. The maritime education and training sector has to accept its share of the blame for the deficiency in training of the country's maritime safety personnel. While the priority of most maritime institutions in the Philippines is the education of seafarers (seabased) the training of maritime personnel in the shorebased industry has been neglected. Perhaps, in the maritime sector, each organization acts independently and is insensitive to the needs and demands of others. This is contrary to the fact that one will cease to exist without the other.

This thesis is devoted to the study of maritime safety enforcement and implementation in the Philippines with a view to identifying the weaknesses of the said organization in order to rectify them.

### **1.1 OBJECTIVES OF THE STUDY**

1. To find out the capabilities of the PCG in the exercise of its maritime safety functions.

2. To determine the operational procedures of the PCG in the implementation of the country's maritime safety rules and regulations.

3. To find out the level of training of the people involved in the enforcement and implementation of maritime safety rules and regulations.

4. To provide viable solution to the problems that will be identified in this thesis.

### **1.2 SIGNIFICANCE OF THE STUDY**

One of the thrusts of the government under "Philippine 2000" by Fidel V. Ramos is to sustain and speed up the country's economic growth and development. This will involve the participation of the different agencies of the government to work together towards the achievement of common objectives. This does not preclude the maritime sectors and those agencies connected to it. Likewise, to achieve growth and development, safety of life and property at sea including the marine environment is also important. The PCG, as an agency of the government is expected to carry out the above responsibilities. It must be stated however that the said organization has not truly lived up to these



expectations. There must be a reason behind this and it is significant to carry out an assessment to find out what causes the organization ineffective in the exercise of its maritime safety functions. It is also interesting to know how the maritime safety personnel of the PCG carry out their assigned tasks in the conduct of maritime safety duties. Likewise, it is important to know what the maritime education and training sector can offer to rectify these problems and what are their capabilities in terms of education and training of maritime personnel. These are some of the difficulties that this study hope to investigate and try to find effective solutions for.

The results of the study, critical as it may appear, will prove beneficial to the following:

1. To the agency concerned, that is entrusted with the responsibility of enforcing and implementing maritime safety rules and regulations.

2. To the Philippine government that needs well trained and competent maritime safety personnel.

3. To the marine environment, that necessitates protection of its resources.

4. To the Filipino people as a whole, who needs guarantee and security of their safety while at sea.

### **1.3 SCOPE AND DELINEATION OF THE STUDY**

The study will center particularly on the agency of the government that deals with maritime safety in the Philippines (PCG). Particularly, the capability of the said organization in the exercise of its maritime safety

functions. Likewise, its maritime safety personnel which are the subject of criticism will need to be assessed.

However, to arrive at an effective solution, the need to study internationally recognized institutions such as the Australian Maritime College (AMC) and the World Maritime University (WMU) will also be the subject of study of this paper. Lastly, the capability of the Philippine Merchant Marine Academy (PMMA) in the training of maritime personnel on shore and at sea will be also considered.

## **CHAPTER 2**

### **THE CURRENT MARITIME POSTGRADUATE EDUCATIONAL SYSTEM AT THE PHILIPPINE MERCHANT MARINE ACADEMY**

The Philippine Merchant Marine Academy (PMMA) is a monotechnic institution specializing in the education and training of future merchant marine officers. It is a government institution, of which the school is under the control and supervision of the Department of Transportation and Communication (DOTC). However, the prescribed curriculum of the academy is under the guidance of the Department of Education Culture and Sports (DECS). Located in Manila, the capital city, the PMMA, with its modern equipment, modern facilities and highly qualified staff, makes the PMMA the leading maritime institution in the Philippines. The courses offered are an undergraduate study leading to the award of a Bachelors Degree and a post graduate study leading to the award of Master of Science Degree. The link with the Norwegian International Shipping makes possible for the offering of short courses in the academy as part of the continuing education of seafarers.

#### **2.1 HISTORICAL BACKGROUND OF EDUCATIONAL SYSTEM AT PMMA**

The educational system at PMMA can be traced back to its foundation. The school was established in April 5, 1820 under the administration of Governor General Mariano Fernandez Corqueras (1816-1822) and was made possible by the royal decree of Spain under the Ministry of Commerce. This was the first time that formal maritime education and training was introduced in the Philippines. The

school was named "Escuela Nautica de Manila" and was the first maritime institution in Asia. The Escuela Nautica de Manila was a vocational school intended for the training of seafarers for the Galleon Trade "Manila-Acapulco trade route". During the Philippine-Spanish Revolution in 1896 the school was closed and reopened only after the Americans occupied Manila in 1899. The Americans, seeing the value of the school reopened it on June 30, 1902 and renamed it "Nautical School of the Philippine Islands". The school was moved to a US Navy warehouse in San Nicolas with four Americans and one Filipino instructor. As the shipping industry in the Philippines deteriorated in the following years of the American occupation, the school was closed again. During 1913 when the shipping industry in the Philippines began to prosper, marked by the appearance of significant number of ships and shipping companies, the need for trained merchant marine officers was felt. The school was reopened in 1913 and was renamed the "Philippine Nautical School". An American master mariner became its superintendent and was succeeded by the first Filipino superintendent named Captain Francisco Castaneda, an experienced master mariner. Later he was joined by Lt. Andrada who was a graduate of the US Naval Academy in Annapolis as an Executive Officer. At that time the curriculum of the school was a four years' Nautical Study of which two years were spent on theoretical study and two years shipboard training in any order. However, the Engineering and Ordinary Seaman Course was only offered during the occupation of the Japanese forces of the Philippine Islands in 1942.

After the liberation of the Philippines from the Japanese and during the early days of the Philippine

Republic, the school continued to provide education and training but the courses were shortened into two years leading to an Associate Degree. This was due to the needs of the Government for merchant marine officers to replace their American counterparts. In June 1963, the Congress passed Republic Act 3680 converting the Philippine Nautical School into the Philippine Merchant Marine Academy (PMMA). In addition, Republic Act 3680 dictates the offering of four years undergraduate programs in Nautical and Engineering disciplines leading to the award of a Bachelor of Science in Marine Transportation (BSMT) and the latter Bachelor of Science in Marine Engineering (BSME). It also prescribed the automatic granting of Third Mate and Fourth Marine Engineer license upon graduation from the academy.

## **2.2 MISSION AND OBJECTIVES**

It is the mission of PMMA to lead in the establishment and maintenance of an educational system, including research and extension, that meet the needs of the maritime industry of the Philippines. Below are the objectives of the PMMA which briefly describe its roles as an educational institution offering higher levels of learning.

The following objectives are taken from the Philippine Merchant Marine Academy Hand Book 1990.

1. To provide the Philippine merchant marine with efficient and well trained merchant marine officers capable of meeting the demands of an ever expanding foreign and coastwise trade.

2. To produce competent naval officers to serve the Armed Forces in time of war or national emergency.

3. To give adequate background knowledge in the shipping and related fields for responsible positions as port supervisors, marine surveyors and shipping executives.

4. To enable the student to have a high moral character by inculcating a sense of responsibility, self discipline and righteousness.

The above objectives justify the establishment of the two post graduate courses offered at PMMA. In general, the two post graduate programs, as part of the educational system meet the perceived needs of the government to upgrade its maritime education and to professionalize further shipping business in the country.

### **2.3 THE POST GRADUATE EDUCATIONAL SYSTEM AT PMMA**

The PMMA maritime postgraduate school is the only maritime graduate school in the country. It commenced operation in April 1993. The aim in establishing the post graduate programs is to provide the Philippine maritime industry with well trained and competent personnel in the shipping and maritime related industries. At present, courses offered for the post graduate study are the Master of Arts in Maritime Education; nautical and engineering streams which are geared towards upgrading maritime education in the Philippines, while the Master in Shipping Business Management is geared towards professionalizing further the shipping business in the country.

The course objectives of Master of Arts in Maritime Education and Training can be summarized as follows:

- to upgrade maritime education in the country through the development of the faculty and academic personnel of other maritime schools and of the PMMA itself.

- to impart to the students educational theories, concepts, principles, methods and techniques to enable them to become more effective teachers, school supervisors or school administrators.

- to train the students to become competent researchers in the field and to undertake research of practical significance to maritime education in the country.

- to impart advanced knowledge to the students in the fields of marine engineering and marine transportation, as appropriate so as to make them more effective teachers.

The above course objectives describe the continuing commitment of PMMA in the development of the Philippine maritime education and training by offering post graduate courses that will upgrade the knowledge and skills of the country's maritime lecturers and academic personnel. Likewise, the course objectives of the Master of Science in Shipping Business Management as stated below are geared towards' attaining the mission and objectives of the academy:

- to advance the professionalization of shipping business practice in the country and to help improve the competitiveness of Philippine shipping companies with overseas operations through the training of current and future managers in the science and art of shipping business management.

- to impart to the students general and shipping specific principles and tools of management through discussions and case studies.

- to enable students to conduct feasibility studies and research for position papers, and to apply such knowledge on a problem of practical significance.

- to make the students aware of the local and international environment in which shipping companies operate.

#### 2.4 ENTRY LEVEL REQUIREMENTS

Since most of the students that will be entering in both programs will have a Bachelors degree with experience in the maritime field or a maritime related field, the admission requirements set forth herein are designed to meet the minimum practicable standard appropriate for admission in the said program.

For MSc. in Shipping Business Management and M.A. in Maritime Education the admission requirements should be a Bachelor of Science Degree either in Marine Engineering or Marine Transportation and the applicant must have at least one year maritime related supervisory or teaching experience. In the case of MSc in Shipping Business



Management, the entry level requirement is a Bachelors degree holder in a relevant field.

However, the holder of an Associate Degree or a two year certificate is required to have at least three years shipboard experience, at least one year of which as an engine or deck officer. Furthermore, the student shall be required to take an additional 30 units of undergraduate study at PMMA.

## 2.5 ACADEMIC PROGRAM

In general, the whole program is designed to be completed by the students within the span of two years. Programs are divided into semesters in which one semester has a duration of about 5 months. The last semester of the program is devoted to thesis writing or in the case of Shipping Management a project feasibility study will be required. Upon successful completion of the required academic program, a degree will be conferred by the graduation committee and the Master of Science Degree will be awarded. However, due to the fact that some of the students will enrol as part time, or some cannot pursue their study due to special circumstances for the subsequent year, a residency of 6 years from the time of the enrollment will be granted to the concerned students.

## 2.6 CURRICULLUM CONTENT

The framework of the post graduate program offered at PMMA is part coursework and part thesis writing. The thesis writing is discussed in the succeeding section, However the coursework of the program is divided into four categories of subject areas. The common subjects are designed to prepare the students for the major subjects prescribed in the program. The major fields of

concentration or specialized subjects are designed to equip the students with specialized knowledge and understanding of the field of study. The electives are subjects designed to provide students with additional knowledge and understanding in accordance with the students' respective field of specialization. The students are required to achieve 15 education units in the major subjects if they are to finish the program. Likewise, the units that will be earned by the students for the whole duration of the course totals 36 units including the equivalent units allotted for the thesis or project feasibility study.

## 2.7 THESIS REQUIREMENTS

The thesis must be an original investigation of a problem in the relevant field that leads to the broadening of knowledge in that field. The thesis must embody scientific research and must be presented in a scholarly manner. The topic of the thesis should embrace those issues related to the student's area of specialization. It should be noted that the thesis is only required for the M.A. in Maritime Education and Training. However, for the MSc in Shipping Business Management, a project feasibility study or a position paper may be considered the equivalent of a Master's thesis. The thesis or project feasibility study is equivalent to 6 credit units.

Upon completion of the thesis, the Dean will call upon the thesis committee to set a time and place for the thesis defence, in which the student shall be given an oral examination on his thesis by the thesis committee. The thesis defence shall be open to the public. Should the student fail the oral examination he shall be allowed

a second attempt not later than one year after the first. A second failure disqualifies him from further work on the particular thesis subject.

## **2.8 FACULTIES**

The PMMA teaching staff is composed of seafarers and non-seafarers. Specialized subjects are handled purely by the seafarers who have long years of experience at sea. This teaching staff is composed of Captains, Chief Engineers and Junior Officers who handle subjects in accordance with their capacity on board. On the other hand, the non-seafarers teaching staff of the academy handle mostly the cultural subjects. This teaching staff have long years of experience teaching in a maritime institution. Most of the teaching staff of the academy are holders of Masters Degrees and some have a Doctoral Degree in maritime and related fields. As part of the faculty development program, the PMMA is continuously upgrading the qualification of its faculties by sponsoring them to take further study in their field of specialization locally and abroad.

## **2.9 TEACHING FACILITIES**

The present site of PMMA is located at Fort Bonifacio Makati. There are nine establishments that are situated within the PMMA compound. Two buildings are utilized as classrooms and can accommodate more than 600 students at any one time. Two dormitories that can accommodate 500 persons are used by the cadets as sleeping quarters. A laboratory for Engineering and Nautical is also provided with the necessary teaching aids and equipment necessary for practical works. There is a conference room that can accommodate 200 students and a computer lab that is available for the use of the

students. The gymnasium and swimming pool are made available for the recreation and physical fitness of the students. Aside from this, a number of video and overhead projectors are also available for the lecturers. There are Radar Simulators and PC based Officer of the Watch is used for the training of cadets as well as seafarers doing short courses. The library houses a large volume of books, periodicals and publications for the use of students and staff.

## 2.10 GRADING SYSTEM

The grading system follows the guidelines prescribed by the DECS for higher education. The so called point system of grading is used by all colleges and universities in the Philippines including the postgraduate education. The PMMA follows this pattern of grading as a basis for evaluation and assessment of the students' performances.

Table 2.1 below is the grading system prescribed by DECS with its equivalent in percentage system of grading.

Table 2.1 PMMA Grading System

Point	Remark	Percentage
1.00	excellent	95 and above
1.25 - 1.5	very good	90 - 94
1.75 - 2.00	good	85 - 89
2.25 - 2.5	satisfactory	80 - 84
2.75 - 3.00	pass	75 - 79
4.00	conditional	70
5.00	fail	69 and below
INC	Incomplete	

Source: PMMA Hand Book 1992

## 2.11 PROGRESSION AND AWARD

A cumulative grade average of 2.00 or better for all graduate courses passed and accepted for credit towards the degree shall be required for eligibility for graduation. Any student who obtains a grade lower than 3.00 in 6 or more units shall be disqualified from the graduate program. On the other hand, for the granting of award, the student should satisfactorily meet all the academic requirements set forth by the PMMA graduate school, before the master's degree, endorsed by the academic council and duly approved by the Board of Trustees, is conferred upon the student.

A student who attains a cumulative grade average of 1.15 or better for all graduate courses passed and accepted for credit towards the degree shall be conferred the Master's degree with honour.

## CHAPTER 3

### POST GRADUATE PROGRAMS IN A SELECTED MARITIME INSTITUTION

The purpose of this chapter is to examine and evaluate the post graduate maritime programs in developed countries with a view to considering their relevance and applicability to the Philippine scene. The decision to study post graduate programs in developed countries is significant since these selected maritime institutions that will be examined in this dissertation are internationally recognized as institutions offering a quality education and high level of learning. Furthermore, they are internationally respectable institutions in their area of specialization.

To fully understand the post graduate programs in the developed countries and their relevance and applicability, examination and evaluation of curriculum such as syllabi, entry level requirements, objectives, etc. of these selected maritime institutions are necessary. The curriculum, which is the core substance of an institution that determines its effectiveness in education and giving of experience to the learners will be the main focus of this chapter. After examination and evaluation of curriculum of these selected maritime institution, modification of certain educational elements and where necessary, adoption of the programs will also be considered by the author, if they are deemed applicable to the Philippines.

The resulting study will be beneficial in formulating new courses that will be offered at PMMA. Most especially the possibility of offering a post graduate programs in Maritime Safety in the Philippines.

### 3.1 WORLD MARITIME UNIVERSITY (WMU)

This was established by the International Maritime Organization (IMO) to assist the developing countries in providing highly trained maritime personnel such as lecturers, administrators, examiners, surveyors and inspectors thereby addressing the serious needs of developing countries for maritime specialists in various aspects of shipping and related fields. Under the guidance of IMO, the university aims to promote the efficiency of international shipping, improvement of maritime safety and the protection of the marine environment. By equipping senior maritime personnel from the developing countries with a high level of education and training in various aspects of shipping and related fields these aims can be achieved. Furthermore, the WMU will be the foreground of transfer of technology from the developed countries to the developing countries.

While the development of shipping for the past decade has changed the character of maritime sectors through rapid advancement in technology and establishment of global standards for ships and shipping, the increasing interdependence of countries on each other and the aspiration of developing countries to build up their own fleet and port facilities, while lacking the necessary expertise, produced a compelling need. To overcome these shortcomings, the International Maritime Organization (IMO) adopted resolution A.510(XII) expressing its concern on the shortages of qualified

maritime personnel and the need for high level training particularly in the developing countries. To answer these needs WMU was established on July 4, 1983 in Malmö, Sweden.

Since its establishment as an international maritime training institution, the WMU has maintained a high level of excellence in education and training of personnel in various aspects of shipping and related fields. The university produces high calibre graduates who are equipped with a high level of knowledge and skills in their area of specialization. Looking at the profiles of WMU graduates, these people, when they go back to their home country, bring with them valuable knowledge gain through intensive education and training in the university.

The profiles of the graduates of WMU can be quoted as follows:

... equipped with sufficient knowledge and skills to enable them to carry out maritime duties and function.

... possessed a good understanding of maritime environment and its operation specifically in their area of specialization.

... sympathetic to the UN particularly to the aims and objectives of IMO.

... flexible enough to accept variety of roles in the maritime and related fields.

... can easily adjust and works in an international environment and multi-cultural scene.



... capable of communicating to a majority of people because of fluency in English language.

... has developed skills in problem solving and critical analysis as expected of a senior maritime practitioner and as a professional.

To date, there are around 981 graduates of WMU from different countries occupying high positions in maritime education and training, maritime administration, in ports and in shipping all over the world. The profiles of the graduates of WMU may be the primary reason why they are easily promoted to a higher position in the government, shipping companies, institutions and academies. Furthermore, most of the graduates represent their own countries in an international fora, meetings, assembly etc. in maritime and related fields.

In order to have a full appreciation of the above profiles, it is necessary to examine the curriculum of the university which is instrumental in achieving the above profiles of the graduates.

### 3.1.1 Course Programs

To meet the aims and objectives of WMU, all programs should prepare the student to become maritime specialists. Course programs of the university should be pertinent to the need of the students and each course must equipped the students with the necessary skills and knowledge relevant to their fields of employment.

In order to attain this, the development of the university's program takes into account the vocational role of the students upon graduation. These vocational

roles or fields of employment on which the graduates will perform can be operational, administrative, policy advisory roles, managerial, teaching and training in various aspects of maritime and related fields. The above vocational roles are well represented in the foundation teaching disciplines of the university. These foundation teaching disciplines or theme of the courses are the National or Public Maritime Administration, Shipping and Port Management and Maritime Education and Training. The five Master of Science degree courses offered at WMU are formulated based on the said foundation teaching disciplines of the university and are broken down into the following courses.

Below are the courses offered at WMU in which the author extracted from WMU hand book (1995).

1. Maritime Safety Administration (MSA) course which incorporate nautical and marine engineering streams. This course is intended for a person with appropriate technical background serving in, or to be appointed to, maritime administrations or associated agencies in a position involving the implementation and administration of maritime safety provisions including the protection and preservation of the marine environment.

2. General Maritime Administration and Environment Protection (GMAEP) course is intended for persons serving in, or to be appointed to, positions involving general or public maritime administrative duties, including responsibilities for marine environmental programmes.

3. Shipping Management (SM) course which incorporates technical and commercial streams. This course is intended for persons serving in, or to be appointed to, positions involving operational/managerial responsibilities associated with a shipping enterprise.

4. Port Management (PM) course incorporates nautical and commercial streams. This course is intended for persons serving in, or to be appointed to, a managerial or administrative position associated with the operation of a commercial ports.

5. Maritime Education and Training incorporates nautical and marine engineering streams. This course is intended for a persons serving in, or to be appointed to, a position involving the planning, delivery or administration of maritime education and training, either in academic institutions, or in industry or other maritime organizations.

In general, the above courses are geared towards providing the students with the necessary knowledge and skills required to become maritime specialists in various aspects of shipping and related fields. These are well reflected in the framework of the five post graduate programs of the university that consist of course works, field study trips and dissertations leading towards achieving the above profiles of the graduates.

The course work as part of the framework of any MSc program of the university provides students with the theoretical knowledge of the subjects related to the course that the students are pursuing. This knowledge is

built-up to a desired level expected of a maritime specialist as the student progresses in the course.

Since the theoretical knowledge alone will not be sufficient to provide students with the desired knowledge, skills and experience, the field study trips as part of the course programs of the university will consolidate in the students mind all the theory that they acquired in the classroom and put this into practice. The field study trips are conducted to different institutions, organizations etc, all over the world. Every student has the opportunity of seeing and interviewing specialist people in the maritime fields eventually gaining first hand experience from them. Aside from this, students acquire a greater understanding in the actual practice of their profession. By exposing the students to a technological advancements in maritime fields, such experiences enhance their knowledge and understanding of the latest technology and ability to apply these in their own country. In general, the field study trips supplement the knowledge and skills acquired by the students in the classroom and provide valuable experience that cannot be gained through study.

Lastly, the dissertation which is a requisite for completion of the course is done in the final year of the students. In consultation with their respective government, the topic of dissertation deals mainly with the problems or projects in the student's country. The student undertakes in-depth study of the topic he has selected and together in consultation with experts in relation to his/her topic, the student comes up with a result which will be beneficial in his/her home country

thus making the dissertation a tool for development and growth.

The five MSc programs of the university as mentioned above, follow two routes both leading to the award of MSc degree upon graduation. First is the standard 20 months Master of Science degree and the second, which the university will be offering in 1995, is the 11 months Master of Science degree program. This latter program is intensive and designed for the student who has an advanced standing. To qualify for the standard and intensive programs of the university, applicants should meet the entry requirements set forth by the WMU Admission Board and this will be discussed in the following section.

Subjects for each course, come in modules which means that each subject matter is covered in a period of one to two weeks. Take for example "Administration" which covers broad areas. In a modular form, this can be broken down into a number of modules so that each module represents part of it. Subjects under "Administration" such as Maritime Administration and Maritime Safety Administration appear as separate modules all in the same areas. Depending on the complexity of the subjects, these modules can be further broken down into sub-modules to be more specific in delivering the topics.

### 3.1.2 Entry Level Requirements

The prospective students who want to study at WMU are mostly nominated by their own government. All applicants are screened and assessed by the WMU Board of Admission to determine suitability for the requested course. The screening process is important since all

applicants come from different countries with different backgrounds and level of education.

Since the expenses that will be incurred by a student for the whole duration of the course is in the range of 20,000 USD for the 11 months MSc degree and 40,000 USD for the 20 months MSc degree, assured fellowship and financing for the student is essential. Financing for the students is shouldered in many cases by their own companies and governments. Other students are funded through bilateral country programs, multilateral organizations, foundations, UNDP country and regional programs. However, a limited number of fellowships are available through IMO. Students can avail themselves of these funding schemes through the university which seeks funding for the students through various organizations such as the Sasakawa Foundation, Japanese Ship Owner's Association, Government of Luxembourg, Carl Duisberg Gesellschaft (CDG) etc.

Good command in the English language is one of the most important factors if the student is to successfully complete the course. Since the medium of teaching at WMU is English, those students who does not have a good command of the English language are required by WMU to take-up an Intensive English Language Program (IELP). However for those students who do not require the (IELP), they must demonstrate their proficiency in the English language by meeting the required criteria set by the university's Admission Board for entry. In such case, the students should at least achieved a mark of 550 points and above in the Test of English as a Foreign Language (TOEFL).

Aside from the above requirements, a nomination form from the endorsing authority and an application form along with it the necessary documents supporting his/her academic and professional qualifications are required. Satisfactory medical examination of students is also necessary prior to admission to the university.

The above entry requirements are common for both standard and intensive programs. However, personal qualifications and experience of students required for entry level in both programs will differ. The personal qualifications of students entering the intensive program is much higher than what is required for standard programs. In such case, students entering the 11 months MSc degree course should have a good undergraduate degree. Students also entering the intensive programs should have considerable professional experience relevant to the course to which they are applying. Lastly, since the duration of the program is 11 months students are required to have an outline of their dissertation ready upon acceptance.

On the other hand, for the 20 months' MSc degree course, entry level requirements are graduate degree only or its equivalent. Furthermore, the applicants do not need professional experience in order to qualify for the programs. As an alternative on the said entry level requirements, the highest grade certificate, in this case master mariner or chief engineer unrestricted or its equivalent together with their corresponding sea experiences will be considered a graduate level qualification.

### 3.1.3 Faculties and Visiting Professors

The university has amongst its teaching staff the most competent professors, associate professors and lecturers. The profiles of the university's teaching staff is truly international. The faculty staff come from different parts of the world and selection is based on their prominence and expertise in their own field. Likewise, the faculty has extensive professional experience in the relevant maritime or academic fields of study. However, the number of teaching staff is small compared to the number of students entering the university per year. Aside from this, the world shipping covers broad aspects so that it is impossible to the university to make a full coverage on the said aspects. To resolve this problem, a visiting professors scheme has been formulated by the university. By inviting renowned experts from the maritime and related fields to teach in the university the whole aspect of shipping and related fields can be covered. Through teaching, these experts can best impart their broad knowledge, skills and experiences to the students thereby enhancing expertise and at the same time contributing to the attainment of the aims and objectives of the university.

### 3.1.4 Learning Activities

The university employs a wide range of learning activities offered to the students in order to enhance the teaching-learning process thereby allowing understanding and so achieve the stated objectives of the course. These learning activities incorporate teaching strategies planned by the lecturers and include those methods by which students may learn by themselves in the classroom.



Depending on the lecturers professional understanding of the task at hand and the need of the students, the learning activities employed by the lecturers of the university vary from each course and can be generalized as follows:

1. Expository teaching - lectures, demonstration, audio-visual presentation.
2. Interactive teaching - similar to expository teaching but employs question-discussion technique such as classroom teaching, tutorials, seminars, group discussion.
3. Small-group teaching/discussion - students in the class are divided into small groups to work independently to achieved tasks; group discussion, 'buzz' groups, small seminars.
4. Models of reality - simulations, practical teaching, role playing of situation.

The above learning activities are integrated in the university's curriculum to facilitate an effective learning process and ensure understanding of the subject matter within the students.

### 3.1.5 Teaching Facilities

To reinforce teaching and learning of both students and lecturers, the university provides adequate facilities to effectively carry out its function as an educational institution of higher learning. The university provides adequate classrooms, computer laboratory, library, offices for staff and personnel and

other facilities all conducive to working and learning. Among other things, the university provides modern teaching aids such as video, overhead projectors, computers, etc., necessary to assist lecturers in the performance of their main functions.

The library, as storage of vast amount of information is essential for the institution. The WMU library, which is the building block of knowledge contains approximately 9000 volumes intended for education and research. To keep abreast with the present development in shipping and the world in general, the university subscribes to 250 periodicals in different languages.

For the purposes of borrowing, acquiring library materials, information and expertise, which are not found in the WMU library, direct contact with other maritime libraries and organizations is maintained. Aside from the above, the library has a computer network which provides access to 10,000 libraries and information center all over the world. In general, the WMU library provide the students unlimited access to all information necessary for research and education purposes.

### 3.1.6 Progression and Award

In order to ascertain the student's progress in the course the criteria set forth by the Academic Council determines if the student will proceed to another semester, have the enrolment terminated, be awarded a MSc Degree or post-graduate diploma. Table 3.1 below shows the grades that the students should attain in order to progress in the course and to qualify for the award of MSc degree. Likewise, Table 3.2 shows the grading system

the university uses in assessments and evaluations of students' performances.

**Table 3.1 Student Progression  
(20 Months MSc Degree)**

Semesters	Grade Average Grade Average Cumulative*	Progression (Remarks)
First	C or Higher D F	Progression to next semester Conditional Enrolment Terminated
Second	C* or Higher D* or F*	Progression to next semester provided no "F" subject grades Enrolment terminated No award
Third	C or Higher D F	Progression to next semester Conditional Enrolment Terminated
Fourth	C* or Higher D* or F*	Award of MSc Degree No degree awarded

Source: WNU Academic Hand Book (1995)

**Table 3.2 Grading System**

Grade	Percentage	Remarks
A+	90 - 100	
A	80 -< 90	Pass
B	65 -< 80	Grades
C	50 -< 65	
D	40 -< 50	Conditional
F	less than 40	Fail grade

Remarks use in conjunction with the Grading System:

- I (Incomplete) - requirements for the subject yet to completed
- IP (In Progress) - subject is yet to be graded
- NA (Not Assessed) - subject that is not assessed
- P (Pass) - pass grade in the subject

Source: WNU Academic Hand Book (1995)

Table 3.1 is the criteria in determining a student's progress and award of the MSc degree. During the second semester, the Cumulative Grade Average (CGA) is the basis in determining whether the student is to qualify for the Msc degree or his/her enrolment will be terminated. To come up with a CGA for the student during the second semester (1st Year), the average grade of the first and second semester is tallied then divided by two so that the resulting value will be the CGA of the students in his/her first year. Likewise during the fourth semester (final year) the same procedure applies. However, based on the above Table 3.1 for the granting of award of MSc degree, the student should attain a CGA of "C" and above and on top of this, he/she should obtain a pass grade in the dissertation and no "F" grades in any subject. If the student fails to meet the required grade for an award, in this case fail grade corresponding to "D" or "F", the MSc degree will not be awarded but instead the student will be given a post graduate diploma.

In connection to the envisioned offering of post graduate programs in Maritime Safety at PMMA, the examination and evaluation of program in MSA will form part of this study.

### **3.1.7 Master of Science in Maritime Safety**

#### **Administration**

In pursuit of the aims and objectives of the university, the MSA program is designed to provide the students with specialized skills and knowledge to efficiently and effectively carry out duties such as administration of marine surveys, associated maritime safety duties and the protection of marine environment.

The MSA course is specifically directed in the education and training of maritime safety administrators and chief marine surveyors.

Corresponding to all MSc degree programs at the university, the course on Maritime Safety Administration (MSA) can be 11 months and 20 months respectively, depending on the level of knowledge and experience of the students and is divided into two streams, the MSA Nautical (MSAN) and MSA Engineering (MSAE) streams both specializing in the safety aspects of ships and the protection of marine environment.

In general, in the MSA Nautical (MSAN) course whether it is intensive or standard, the programs are geared to build-up the knowledge and skills of students to a required level in the nautical discipline taking into consideration the objectives of the course. Likewise, the MSA Engineering course is geared to build up the knowledge and skills of students to a required level in the engineering discipline.

#### 3.1.7.1 Entry Level Requirements

In addition to the entry requirements discussed in this chapter, candidates who want to qualify for the MSA course whether it is the standard or the intensive course must have a degree in a relevant nautical or engineering discipline together with experience as a marine surveyor or other associated maritime safety duties. In which case, candidates are reviewed by the admission board to determine their suitability to enter the MSA course.

### 3.1.7.2 Examination of Syllabus for Maritime Safety Administration

The MSA syllabus as part of the university's curriculum is divided into two disciplines, the MSAN and the MSAE syllabus. The structure of the syllabus for both streams is composed of subjects common to all courses, subjects common to both streams and specialized subjects for a specific stream.

The common subjects are taken by all the students in the first semester of the school year irrespective of the course. These subjects aim to provide the students with a general understanding of the legal, regulatory, economic and environmental aspects of the use of the sea. The common subjects cover 25% of the total lecturing time for the whole duration of the standard course. In general, the first semester subjects give all the students a general appreciation of the proper use of the sea.

The second semester is spent mainly on subjects which are more specific and are taken by both MSAN and MSAE students. These common subjects for both streams provide the students with adequate knowledge of maritime safety and environmental protection. Students will also learn the subjects of administration and policy advising responsibilities with emphasis on provisions regarding the survey of vessels, maritime casualties, and competence of seafarers as stated in the course objectives for MSA.

On the other hand, the specialized subjects provide the students with a thorough understanding of the knowledge and skills required for maritime specialist surveys, maritime safety administration and other associated maritime safety duties. While the common subjects are mostly covered during the first and second semester of the school year, most of the specialized subjects are given to the students in the third and fourth semesters with the addition of subjects common to both streams. At this point both MSAN and MSAE branch out to concentrate more on subjects intended for their area of specialization.

As mentioned before, the syllabus contents come in modular form, and the class contact hours to cover specific modules vary much depending on the coverage of the topic. The following tables shows the total class contact hours for the 20 months MSAN and MSAE course covering the whole duration of the program.

Table 3.3 Class Contact Hours (CCH) for MSAN  
(20 months MSc Degree)

Semesters	Common	Specific	Total
1st semester	252.0	46.5	298.5
2nd semester	115.5	105.0	220.5
3rd semester	222.0	58.5	280.5
4th semester	73.5	19.5	93.0
Grand total	663.0	229.5	892.5

Source: WNU Academic Handbook 1995

Table 3.4 Class Contact Hours (CCH) for MSAE  
(20 months MSc Degree)

Semesters	Common	Specific	Total
1st semester	252.0	49.5	301.5
2nd semester	115.5	91.5	207.0
3rd semester	222.0	60.0	282.0
4th semester	73.5	19.5	93.0
Grand total	663.0	220.5	883.5

Source: WMU Academic Handbook 1995

The above tables show's that the number of CCH given to common subjects is relatively large compared with those of the specialized subjects. It should be noted that the above figures for common subjects combine subjects that are common to all courses and subjects common to both MSAN and MSAE. However, the total CCH for subjects common to all courses of the university have an average of about 222 hours which represents 25% of the total duration of CCH for the whole 20 months' course. Referring to the above grand total of CCH, the student of MSAN spends about 15 months of theoretical study in the classroom assuming that the average CCH per day is 3 hours. The remaining five months will be spent on field study trips, dissertation preparation and semestral breaks.

On the other hand, the 11 months course which is basically intensive has a CCH below that of the 20 months MSA course. The reason for this is obvious, the 11 months MSc degree have shortened modules compared to those undertaken by the 20 months standard course. This is



represented in the Table 3.5 below showing CCH for MSAN and MSAE intensive course.

Table 3.5 Class Contact Hours (CCH) for MSAN and MSAE (11 months MSc Degree)

Semesters	Common	Specific	Total
1st semester	277.5	58.5	336.0
2nd semester	133.5	91.5	225.0
Grand total	411.0	150.0	561.0

Source: WHU Academic Handbook 1995

The above grand total for CCH can be found in the syllabus of the 11 months intensive course for MSAN and MSAE. (see APPENDIX I). Based on the above tables 3.3 and 3.4, we can derive a comparison of the CCH for intensive and standard course for MSA. The common subjects offered for the intensive course are 62% of the total CCH given to the students pursuing the standard course. Likewise, for the specialized subjects, 67% of the total CCH for the standard course is obtained by the students entering intensive courses. The above percentage is reasonable, but this means limiting some of the CCH for certain subjects and retaining only those points that are necessary to the subjects. Nevertheless, students entering this program have an advance standing as indicated in the entry requirements for the intensive course.

### 3.2 AUSTRALIAN MARITIME COLLEGE (AMC)

The 1960s and 70s was a period of rapid change in the shipping industry. A feature of it was the emergence of different types and sizes of ships and the rapid

advancement of technology in the shipping world. These changes, caused concern for the Australian Commonwealth Government especially in regard to Australian maritime education and training which was failing to cope with the new developments in the shipping industry. The situation was further aggravated by the advent of the 200 miles fishing zone for which the training of Australian fishermen was not adequate enough to sustain greater utilization of the zone. A study was made of these factors by a Commission of Inquiry into the Maritime Industry which concluded that training for the shipping and fishing industry was insufficient. It recommended the establishment of a national maritime college.

Considering the above, the establishment of the Australian Maritime College (AMC) was made possible by the enactment of national legislation which is known as the Maritime College Act 1978. Furthermore, as stated in the Act of 1978, the AMC would become an autonomous tertiary educational institution in Australia. It is the primary mission of the college to provide maritime and maritime related education, training, research and development thereby fulfilling the needs of the Australian community. This is further reflected in the main objective of the AMC which is to provide world-class education and training programs for maritime and related fields. Situated in Tasmania, the college provides for a wide range of disciplines. Among these are the programs leading to the award of certificates, diplomas, degrees and higher degrees and short courses. Established as the center for maritime education and training in Australia, the college endeavours for excellence in education and training of maritime personnel on shore as well as at sea.

As mentioned before, it is beneficial to this dissertation to examine the curriculum of the programs offered at AMC. Since the college does not offer a specialized course such as Maritime Safety Administration, the examination will be centered on the structure of its curriculum, which will be essential information for structuring and formulating the curriculum for the new program that will be offered at PMMA.

### 3.2.1 Course Programs

As mentioned earlier, the AMC offers a wide range of courses. However, for the purposes of this dissertation, the post graduate degree course will be the focus of the foregoing study. Furthermore, the courses or programs that will be referred to in this chapter pertain to post graduate programs. Additionally, the term external will mean distant education.

The rationale for the establishment of the post graduate courses at AMC can also be found in the Maritime College Act 1978 in which the principal functions of the college are laid down.

Below is the Maritime College Act (no. 54 of 1978) par. 7 (a) prescribing the function of the AMC.

...to conduct an institution for the provision of such maritime and maritime related education and training ...being principally tertiary education for persons who wish to become, or are, officers on merchant or fishing vessels or who wish to become, or are, otherwise engaged

in connection with shipping or the fishing industry.

Source: AMC Hand Book

During the early years of the AMC, the development of the courses was centered to address the needs of the seafarers. To meet the needs of the shore based industry, a comprehensive study was conducted by the college and the results was the offering of post graduate programs that will basically meet the demands of Australia's shore based industry. During the years 1986-1992 post graduate diploma in Port Management and Shipping Management were offered. From 1993, a Master of Business degree in either of these disciplines was introduced, underpinned by a pyramidal structure of post graduate certificate and diplomas in the same disciplines. Furthermore, basing on the above study, prospective students will be continuously drawn from three distinct groups of personnel associated mainly with shipping, ports and terminals. These identified sectors of the shore based industry are the major areas of study of the post graduate programs offered at AMC.

Taking the current programs, the structure of the course offered at AMC is categorized into three levels; the Graduate Certificate Course, Graduate Diploma Course, and the Master of Business course with each course being divided into two streams as indicated below:

1. Graduate Certificate of Business either shipping or port and terminal management.

2. Graduate Diploma in Business either shipping or port and terminal management.

3. Master of Business either shipping or port and terminal management.

It is important to note that the above courses can be offered internally or externally. Where they are offered internally, students can take them full time or part time. Furthermore, the subjects or unit allowed for a student will vary depending whether or not the student is full time, part time or external.

The Graduate Certificate Course contains four basic coursework units for the whole duration of the course. Depending on the scheme, this program can be accomplished by the student within a period of one semester at a rate of four units on a full time basis. However if taken externally it will take one year for the students at a rate of two units per semester. This course is intended for those persons who has experience but are not well qualified academically. Furthermore, it is designed for the ship's officer who wants to seek employment ashore. Additionally, this course is suitable for a person who would find the Graduate Diploma Course too demanding for him or her.

The Graduate Diploma Course has a duration of one to four years, depending on whether the student is taking it internally or externally. This course is composed of eight coursework units for the whole duration of the course. Depending on how the student schedules the said coursework, if this program is taken externally, it is possible for the student to finish the said course within the span of two years provided that is taken at a rate of 2 units per semester. But if taken at a rate of 1 unit per semester, the student will have a maximum of four

years to complete the course. However, if taken internally, the student will be able to cover the course within one year at a rate of 4 units per semester.

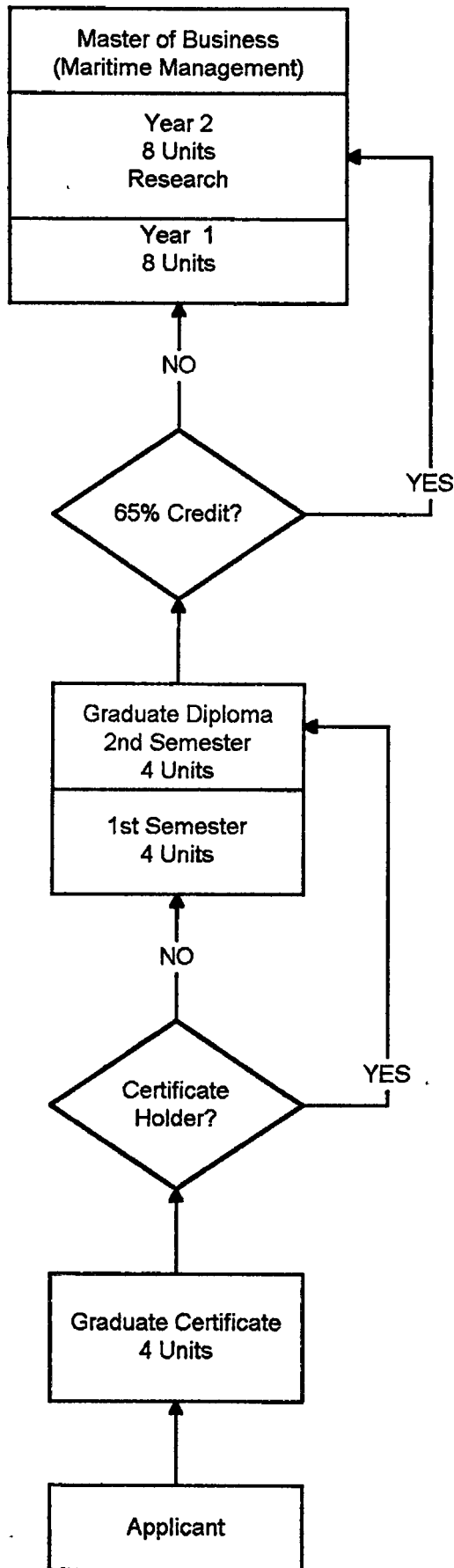
The Master of Business (Maritime Management) is geared towards providing the students with the necessary skills and knowledge to become an expert in the sector of the shipping industry. This course is composed of 8 coursework units followed by 8 research units. The research units will be undertaken by the student in the second year. If conducted externally, the student will finish the entire course within the span of three to four years at a rate of 2 units per semester followed by 8 research units. However if conducted internally, it is expected that the student will cover the whole course within eighteen months at a rate of 4 units per semester followed by 8 research units.

The uniqueness of the three post graduate programs of the AMC as described above is the bridging of the courses. This means that the units taken by the students in one particular course can be credited should they decide to pursue a higher degree course. Furthermore, the courses are so designed that every subject in a particular course is continued to a higher degree course. To understand further how the bridging of the courses works, a student who is a holder of a Graduate Certificate Course can pursue a Graduate Diploma Course so that the units he or she earned in the said course will be credited. This means that the student is exempted from the first four units of the Graduate Diploma Course equating to about 65% credit level achievements of students in the Graduate Certificate Course.

Likewise, for a holder of Graduate Diploma Course, who has attained the required credit level achievements who will be given direct entry to the second year (research) of Master of Business provided that he or she passes the preparatory unit which is the Research Methods. However, if he or she fails to attain the 65% credit level allowable, he or she will be required to take those units missed or to take equivalent units to attain the said required credit level achievements before progressing to the second year of the Master of Business.

Figure 3.1 below shows the pyramidal structure of the programs offered at Australian Maritime College.

Figure 3.1 Pyramidal Structure of Program (AMC)





### 3.2.2 Entry Requirements

There are three possible ways in order to qualify for both the Graduate Certificate and the Graduate Diploma Course offered at AMC. The applicant who wants to qualify in the said programs must have one of the following qualifications.

The first possibility is a first degree or diploma in Business or those disciplines which are related to Business such as Commerce, Economics, Law, Management, Transport and Distribution, or Nautical studies. The second possibility is a holder of Master's or Marine Engineer's certificate of competency Class I (unrestricted). The last possibility relate to other qualifications that are not covered by the first and second methods and will be accepted provided that the applicants has suitable industrial experience in a related discipline. However, different countries have different titles given to the qualifications but in general they fall into the same category. In lieu of the above, the overseas equivalent of the first second and third requirements will be accepted.

For the Master of Business (Maritime Management), the entry requirements for this course is a minimum of an undergraduate Baccalaureate degree; Bachelor of Business or non-business will be admitted. Another possibility for admission into the program is a holder of a Graduate Diploma of Business in both streams. In the case of applicants who has exceptional standing, he or she may be admitted directly to the second year of the Master of Business provided that he or she has evidence in the form of exceptional applied work experience and publications. Aside from this, a student may be asked to provide a

supplementary works in relation to any proposed dissertation.

### 3.2.3 Faculties

The five graduate courses offered at AMC are mostly handled by the full time staff of the college. The full time staff of AMC consist of ex-seafarers and non-seafarers. The ex-seafarers are chosen based on their extensive experience at sea and expertise in their own field. On the otherhand, the non-seafarers engaged in teaching on the graduate programs have long time experience in the shipping industry (shore based). But in general, the professional staff of AMC was selected in accordance with the statutory requirements of the Government of Australia or the United Kingdom.

As the courses involve subjects on Accounting and Finance in shipping and or Managing the Financial Resources, the need to have an experts in this fields is essential. Two part-time members of staff handle these subjects. These part-time lecturers are professionally qualified accountants engaged in private practices in the relevant fields.

### 3.2.4 Teaching Facilities

To strengthen both learning and teaching of students and staff, the facilities should be substantial to meet the needs of both students and staff. The AMC, being the center for Australia's education and training of seafarers, has the most modern teaching facilities in the country. Aside from various simulators for the training of seafarers, the college provides for the students computers for which students can gain access for 24 per day hours. These computers are interlinked via ETHERNET

to facilitate working and retrieval of necessary information needed by the students. Classroom facilities include a 170 seat lecture theatre, 10 classrooms and a number of laboratories of various sizes. To give the students a feeling of office-like atmosphere, the Sea Transport Center was built for the purpose of simulating a working environment common to the shipping industry. Among other things, resource materials can be found which are relevant to the course such as chart of accounts, graduate projects, microfiche and statistical collection which are available to the students.

The library as a vast storage of maritime information is vital for the institution. The library houses a collection of 30,000 specialist volumes, subscribes to 190 serials, some 750 miscellaneous serial publications and an audio visual collection of about 600 items necessary for research and education purposes. As an extension of the services offered to the students, the library is connected to other libraries by facsimile machine so that those information which cannot be found within the AMC library can be made available for the students.

### 3.2.6 Progression and Awards

The student progression in the course is determined by the criteria set forth by the Course Examination Committee of the AMC. In case of the student taking the Certificate course or Diploma course, he or she have to fulfil two conditions to progress in the course, namely the completion of all assessment and the completion of all the prerequisite of the course. The assessment consist of course works (tutorials, practicals,

assignments, test) and examination. Students should achieved a pass marks of 50% or above in the assessment.

However, for the Master of Business, the student should meet the above requirements and aside from this he or she should attain 65% credit level achievement before proceeding to the second year which is the research.

The Table 3.6 below is the grading system used in the assessment of student.

Table 3.6 Grading System

Grades	Remarks
D (Distinction)	Outstanding performance in a subject
C (Credit)	A good performance, below outstanding but more than satisfactory
P (Pass)	Satisfactory, denotes performance of acceptable standard
F (Fail)	Unsatisfactory performance
S (Supplementary)	Conditional

Remarks use in conjunction with the Grading system and students academic record:

DE (Deferred Examination) - The student has been granted deferred examination, or other form of assessment in lieu of a deferred examination, in a unit, and that a grade has not been awarded.

ET (Extension) - The student has been granted an extension of time to complete items of assessment for a unit, prior to a grade being awarded.

E (Exempt) - The student has been exempted from enrolment in the unit by virtue or being granted advanced standing in the course.

NA (Not Assessable)-Indicating that the unit was not an assessable unit.

Source: AMC Hand Book

However, in order to determine the equivalent percentage of the above grading system, the standard deviation of the mean, in this case a pass mark of 50% is used. The precise value of the standard deviation is prescribe by the Course Examination Committee.

In such case, that the student fails to satisfy the criteria set forth by the Course Examination Committee, in this case a CGA of "F" he may be permitted further to satisfy the examiner but with certain limitation. Table 3.7 below are the maximum period allowed for the completion of the course:

Table 3.7 Maximum Period for Completion of the Course

Courses	Description	Duration
Graduate Certificate	Internal	Two Years
Graduate Certificate	External	Three Years
Graduate Diplomas	Internal	Two Years
Graduate Diplomas	External	Four Years
Master of Business	Direct entry to 2nd Year	Two Years
Master of Business	External	Four Years
Master of Business	Internal	Three Years

Source: AMC Hand Book

On successful completion of all the requirements of the course, students will be awarded a:

- Graduate Certificate in Business (Shipping)
- Graduate Certificate in Business (Port and Terminal Mgmt)
- Graduate Diploma in Business (Shipping)
- Graduate Diploma in Business (Port and Terminal Mgmt.)
- Master of Business (Maritime Management)

Students who excel during the course of their study in either of the course stated above will be given an award with Distinction.

## **CHAPTER 4**

### **A STUDY OF THE NEEDS OF THE GOVERNMENT FOR WELL TRAINED AND COMPETENT MARITIME SAFETY PERSONNEL**

This chapter is devoted to look into the whole concept of maritime safety in the Philippines, especially into the people involved in carrying out maritime safety functions with a view to identifying their weaknesses in the performance of their duties and responsibilities.

The Philippine Coast Guard being the key player in enforcing and administrating the country's laws and regulations regarding the safety of vessels, passengers and crew and the safety of the marine environment will be the main focus of the foregoing study. To understand further the concept of maritime safety in the Philippines, it is important to know the structure of these organizations, their duties and responsibilities pertaining to safety, the maritime environment in which this organization operates, and some of the maritime casualties and accidents that occurred during the previous years.

#### **4.1 BACKGROUND**

The Philippines is a maritime country by virtue of its geographical location and configuration. Composed of 7,000 islands, the maritime transport system is vital in integrating the various islands of the country. It is also one of the key factors in the development of the country because it answers the needs and demands for the transport of cargoes and passengers in the islands.

Passenger and cargo traffic in the country is quite enormous. The passenger traffic in the islands is seasonal, reaching its peak on the month of March to May and during the month of December. In general, there is increased demand for passengers and cargoes in the country due to development. A study conducted by the Philippine Port Authority indicates that from 1985 to 1990, both passenger and cargo demand has grown on average by 16% and 14% respectively.

To boost the demand of passengers and cargoes, adequate ports and facilities are important. Today, the total number of ports in the country is 391 serving the needs of both foreign and coastwise trade vessels. Among the total number of ports, there are 19 major ports, which serve both domestic and foreign trade, 59 sub-ports or terminal ports, and 85 municipal and private ports which are a smaller ports that serve as feeder ports for the major ports. The port of Manila and Cebu are the most busiest port in the country. These major ports can accommodate both foreign and domestic trade vessels. Foreign flag vessels alone calling at Philippine ports reach an average of 3000 vessels per year.

#### **4.2 BASIC FEATURES OF THE PHILIPPINE DOMESTIC FLEET**

Since time immemorial, trade by sea has been prevalent in the archipelago. Ancestors used to trade their goods by ships around the islands and within the neighbouring countries. Today, activities by sea still predominate in the country. Ships of different types and sizes are utilized in transporting cargoes and passengers from different parts of the islands.



At present, there are around 21,618 domestic registered vessels in the country. Among the total number of vessels, the majority of them are privately owned and a few are owned by the government. Table 4.1 shows the number of vessels comprising the Philippine domestic fleet.

Table 4.1 Philippine Domestic Fleet (1991)

Vessels	Number	Gross reg. tonnage
Passenger Ferry	977	261,522.75
Passenger Cargo	812	522,424.07
General Cargo	3,786	11,950,407.67
Barge	2,723	1,072,123.98
Oil tanker	320	721,024.06
Tugboat	1,993	118,178.16
Yacht	241	12,073.35
Pilot Vessel	24	214.8
Fishing Vessel	8,943	43,367.75
General Purpose	694	83,544.24
Motor Launch	218	6,061.58
Motor Boat	887	259,319.20
<b>Total</b>	<b>21618</b>	<b>15,050,261.61</b>

Source: Philippine Coast Guard

The structure of the shipping fleet in the Philippines is characterized by small and large vessels. The small vessels are of wooden construction while the larger vessels are steel hulled and second-hand in nature. In general, Philippine domestic shipping is a "second-hand industry". This is quite true because to build a large steel hulled vessel in the Philippines is

very expensive when compared to buying a second hand vessel or bareboat chartering which will be economically wise from the owners point of view. Table 4.2 shows the major characteristics of the Philippine domestic fleet.

**Table 4.2 Characteristics of Phil. Domestic Fleet**

Size	250 GRT and Above	250 GRT and Below
Number	Small Number	Large Number
Hull	Steel	Wood
Procurement	Imported	Domestic Construction
Age	Old	Relatively New

Source: Japan Int'l Cooperation Agency

While these larger vessels are second-hand in nature, it is obvious that they are old and most of them should have been ought to be retired from the service. This gives us an indication that these vessels are not safe. Statistics taken from Maritime Industry Authority (MARINA) show the average age of the Philippine fleet for vessels of 250 GRT. and above, as shown in table 4.3 below.

The irony of the above situation is that most of these vessels were purchased or bareboat chartered in the Philippines to continue the services. In addition, some of the old and unsafe second hand passenger vessels have undergone conversion to increase the carriage capacity of passengers and cargoes compromising the safety of passengers on board.

Table 4.3 Average age of Phil. Domestic Fleet

Type of Vessel	Average Age (Years)
Passenger Ferry	10
Passenger Cargo	11.5
Passenger Container	17
General Cargo	13.5
Container Vessel	15.5
Tanker	18

Source: Maritime Industry Authority

However, the idea to increase the passenger vessels' capacity by conversion is completely illogical in the context of safety. Shipping Development Company (SHIPDECO) a Norwegian company report as quoted below describes the situation:

"Most of the Philippine passenger ships are unsafe because of the tight stowage of passengers ...corridors and stairways are narrow and not designed for the volume of passengers and baggage permitted on board".

Source: Japan Int'l Cooperation Agency

On the other hand, while the small wooden vessels are relatively new, they were constructed without plans of any kind relying solely on the experience of the builder. The precarious situation is that many of these vessels are being built without watertight bulkheads or in some cases, bulkheads are unable to maintain their watertightness.

To aggravate the situation further, most of these vessels are navigating within the confines of Philippine

waters and frequently have to traverse the treacherous portion of the waters which are characterized by shallow rivers, lakes and canals. In addition to this, the Philippines is a typhoon belt area experiencing an average of 15 typhoons yearly. These unfavourable meteorological conditions that the country experiences yearly poses a great threat to the national fleet.

The characteristics, structure and age of the Philippine fleet accounts for the numerous number of maritime accidents in the Philippine waters. When confronted with bad weather associated with heavy seas, they are most likely to capsize, sink, etc.

#### 4.3 MARITIME ACCIDENTS AND CASUALTIES

On the night of December 20, 1987 at around 2000 Hrs local time, M/V Doña Paz a 2,215 GRT passenger vessel was navigating in the vicinity of Dumali Point in Tablas Strait when she suddenly collided with M/T Vector a 629 GRT tanker vessel. The Doña Paz sank, taking with her an estimated number of more than 4000 passengers and crew members. Both vessels were unseaworthy when they made their voyage.

Prior to this accident, the history of unseaworthiness of Doña Paz can be traced back to the time of its introduction into the Philippine shipping. When this vessel was put in service, it underwent conversion to maximize the carrying capacity of passengers for economic reasons. Originally, she was designed to carry 608 passengers, but when conversion was finished she could carry 1,400 passengers! Since she made her voyage in the month of December, it coincided with the peak month for the influx of passengers on board, and

she was overloaded with passengers at the time she left port. On the other hand, the ship's passenger manifest did not reflect the true number of passengers on board. This accounts for the numerous contradictory reports as to the total number of casualties. But it is believed that there were around 4000 passengers actually on board when the incident happened. Whereas, to overload the vessels with passengers and cargo is a common scene in the Philippines, the author himself experienced this kind of situation. The Doña Paz case is the worst in the history of Philippine shipping.

On a different occasion, during 1986, the ship M/V Doña Josefina was sailing bound to Isabel, Leyte. The weather conditions at that time were fine when suddenly the ship capsized and sank due to the loss of stability taking with her a total of 150 passengers.

In addition to the above, a large number of maritime accidents occur every year. During the eight years period from 1982-1990, a total of 2,017 vessels were involved in maritime accidents. Table 4.4 below shows the total number of maritime accidents from 1982 - 1990.

The dramatic increase of maritime accidents in the years 1984 and 1990 is due to typhoons which cause a large number of vessels to capsize or sink. But in general, the occurrence of maritime accidents in the Philippines is increasing as indicated on figure 4.1. The reason for this has been mentioned before; substandard vessels.

Table 4.4 Maritime Accident  
(1982-1990)

Accident type	'82	'83	'84	'85	'86	'87	'88	'89	'90
Drifted	21	8	—	21	38	29	22	28	45
Aground	22	19	61	29	46	45	30	37	103
Collided	6	5	3	2	21	8	6	20	20
Fire	16	17	10	11	6	8	4	9	10
Capsized	20	21	24	25	30	35	32	36	78
Sunk	27	20	138	28	29	36	61	92	118
Missing	34	41	51	30	36	33	52	57	47
Total	146	131	287	146	206	194	207	279	421
Grand Total	= 2,017								

Source: Philippine Coast Guard

On the other hand, maritime casualties recorded in the same years were 20,700 persons including 5,953 dead or missing. Table 4.5 below shows the maritime casualties in the Philippines in the same years.

Table 4.5 Maritime Casualty  
(1982-1990)

Years	82	83	84	85	86	87	88	89	90
Rescued	602	2035	2868	1166	1390	1059	1647	1307	2673
Missing	312	337	386	293	393	1605	579	454	371
Dead	47	59	204	135	125	253	276	75	49
Total	961	2431	3458	1594	1908	2917	2502	1836	3093
Grand Total	= 20,700								

Source: Philippine Coast Guard

It is inconceivable that while most of the Philippine fleet is old and substandard, such vessel are

still operating and invariably serving the increasing demand of passenger and cargo in the country.

It is said that there are many contributory factors to the deficiency of the Philippine fleet. But on the other hand, if we have to preserve life and property at sea, safety should be the prime and foremost intent of every maritime organization. This can only be achieved by inculcating awareness and understanding of the context of maritime safety.

#### 4.4 THE PHILIPPINE COAST GUARD

The PCG is a major unit of the Philippine Navy (PN) and is headed by a commandant acting as an overall head of the organization. Created by virtue of Republic Act 5173, the Philippine Coast Guard (PCG) is the maritime safety administration of the Philippines.

##### 4.4.1 Mission

In general, the mission of the PCG is to promote safety of life at sea, safeguard and preserve the marine resources and environment, promote maritime security, enforce all applicable laws upon the high seas subject to the jurisdiction of the Philippines, and assist in national security and development.

##### 4.4.2 Major Functions

The major functions of the said organization are divided into five areas. Maritime administration (MARAD), Maritime operations (MAROPS), Maritime environmental protection (MARPOL), Maritime search and rescue (MARSAR), and Maritime law enforcement (MARLEN). Under these functions the whole concept of maritime safety administration is well covered.

#### 4.4.3 Regulatory Unit

In the exercise of its maritime safety functions the PCG has designated four of its general maritime staff to assume the responsibility of developing and formulating policies, rules and regulations in accordance with their specific specialties. The following consist the General Maritime Staff of the PCG that cover these responsibilities:

CG-8 (Vessel safety) - Develop and formulate vessels safety rules and regulations to include but not limited to registrations, documentations, operation and inspection of Philippine flag vessels (foreign and domestic) within the jurisdiction of the Philippines.

CG-9 (Marine environmental protection) - Develop and formulate vessels safety rules and regulations pertaining to the prevention and control of pollution from ships.

CG-10 (Aids to navigation) - Formulate plans for the construction, operation, maintenance of navigational aids within the Philippine waters.

CG-11 (Merchant marine administration) - Develop and formulate rules and regulations pertaining to training, administration and regulation of merchant marine personnel.

#### 4.4.4 The Coast Guard Districts and Coast Guard Stations

While the regulatory aspects of maritime safety are well covered by the four General Maritime Staff, the power of enforcement and implementation is bestowed on its districts and stations. To effect a full coverage of



the whole archipelago eight Coast Guard Districts (CGD) are organized covering the whole country. Each district is headed by a district commander. Under the eight districts are 41 Coast Guard Stations (CGS) and 138 Coast Guard Detachments.

#### 4.4.5 Philippine Coast Guard Specialized Units

These are organized to assist the head of PCG in the execution of functions not covered by any of the operating units. Below are the PCG specialized units assisting the Commandant of PCG in the exercise of his duties and responsibilities.

The Maritime Safety Office (MSO) reviews and approved ship's plan, tonnage calculation or tonnage measurements, ship's stability and vessel's inspection.

The National Operation Center for Oil Pollution (NOCOP) is tasked primarily in the prevention and control of marine pollution in the country. This unit will act also as the operation center in case of pollution incidents.

The Aids to Navigation Command (ANC) was created for the maintenance, operation and installation of all aids to navigation within the Philippine waters.

The Seaman's Processing and Review Unit (SPRU) was created to administer and register merchant marine personnel. The Issuance of Seaman's Continuous Discharge Books are its primary function.

#### 4.5 ANALYSIS OF THE SITUATION

Philippines maritime safety laws substantially covers all aspect of safety for the protection and preservation of life and property including the marine environment. The organizational set-up of PCG. coupled with its districts, stations and detachments covering the entire archipelago is substantial to enforce and implement the national maritime safety rules and regulations. It is inconceivable that inspite of substantial laws and good set-up of maritime safety organization, a majority of the Philippine fleet is still operating in substandard condition leading to the increase of maritime accidents and casualties in the Philippine waters.

On the other hand, the essence of maritime safety lies in the enforcement and implementation of existing maritime rules and regulations. Likewise and most important is the capability of personnel to enforce and implement such functions in consideration of their existing knowledge, skills and experiences.

This section is devoted to the analysis of the maritime safety enforcement and implementation in the Philippines with a view in determining weaknesses.

##### 4.5.1 Maritime Safety Enforcement and Implementation

As mentioned in this chapter, the Philippine Coast Guard formulates, promulgates, enforces and implements rules and regulations in the exercise of its maritime safety function. It covers all vessels and merchant marine personnel within the maritime jurisdiction of the Philippines. To assist the personnel of the PCG in the execution of its maritime safety function, the Philippine

Merchant Marine Rules and Regulations (PMMRR) were promulgated. These rules and regulations cover provision pertaining to and stipulated in international maritime conventions such as SOLAS, LOADLINE, COLREG, STCW as applicable to the domestic maritime scene. To address matters relating to its functions which are not contained in the PMMRR, the PCG formulates and promulgates rules and regulations in the form of Memorandum-Circulars. Regulations relating to MARPOL are contained in the forms of Memo-Circular.

It is important to note that while the PMMRR is considered the bible of maritime safety, it becomes progressively obsolete. It was only around 1991 that the need to review PMMRR arose to keep abreast of the present development but the unrevised PMMRR is still in force until will be superseded by the new one.

The obligation to enforce and implement maritime safety rules and regulations is carried out in the district level (CGD and CGS) of the PCG. In general, inspection/survey of vessels conducted at the district level is categorized into two:

1. Inspection for purposes of certification (Certificate of Inspection).
2. Inspection for control verification

Furthermore, inspectors/surveyors of PCG are placed into two categories depending on the type of inspections they are conducting. First is the Maritime Safety Engineers (MSE), civilian surveyors of the PCG who conduct inspections for the purposes of certification. The second is the military inspectors of the PCG who are

conducting inspections for control verification such as port state control.

Survey/inspection of vessels whether they are newly built, acquired or have undergone alterations is done at the District Maritime Affairs Division, Coast Guard Districts and Coast Guard Stations. Each CGD and CGS is headed by a commander who has the over-all responsibility to his area of jurisdiction. Under his supervision are the civilian Maritime Safety Engineers (MSE) that comprise Naval Architects, Marine Engineers, Mechanical Engineers and Electrical Engineers. The MSE surveyors conduct the full range of surveys and inspections of vessels for the purposes of certification.

The mandatory inspection of vessels as stipulated in the PCG rules and regulations as a requirement for the issuance of Certificate of Inspection (CI) is as follows:

1. Condition of Hull
2. Condition of machineries
3. Condition of equipment
  - Navigational equipment
  - Fire fighting equipment
  - Communication equipment
  - Preventive oil pollution equipment
4. Manning requirements
5. Ship's documentations
  - approved certificate of tonnage measurement
  - certificate of stability

The above mandatory requirements are performed by the MSE who conduct surveys of vessels applying for CI.

In order that the surveyors can conduct this kind of survey effectively, the surveyors should possess the desired skills and knowledge of the whole aspect of safety. On the other hand, the MSE level of proficiency, knowledge and skills is not enough to conduct a full range survey on the above requirements due to their educational background. Because the MSE have only an engineering background, it seems inappropriate that a marine engineer or electrical engineer will survey the ship's navigational equipment such as radar, ARPA, compass, life saving equipment etc. Likewise a naval architect and mechanical engineer will not be effective in conducting full range surveys of the above requirements to determine full compliance for obvious reasons. It is in this aspects that the civilian maritime safety surveyors are not effective. Due to the fact that the PCG do not have nautical surveyors, the survey of navigational and life saving equipment is delegated to the MSE of which is not their specialty, so that in effect, an obvious fault can escape their detection. Worse is that, neither the said organization have a program to address the deficiency of their surveyors on this aspects.

Since most of the MSE are a graduate of Naval Architecture, Mechanical and Electrical Engineering, their educational background embraces only services in the form of plans, specification, estimates, and supervision of construction, alteration, or structural survey of any floating vessel including plans or layouts, specifications, estimates or supervision of installation of marine power plants and associated equipment. Aside from this, nowhere during the practice of their profession where these surveyors have rendered an actual

shipboard training which is essential to have a full appreciation regarding the vessels' safety. In addition, they have very limited idea in the operational and technical aspects of the vessels' navigational equipment and life saving appliances aboardship which are essential in determining vessels compliance to SOLAS and to the national regulations that are mandatory requirements prior issuance of CI.

To aggravate the situation further, PCG has no program to update the knowledge and skills of these surveyors in view of the present technological advancement. Most of the surveyors' knowledge and skills regarding safety is mostly acquired through experience. The irony of the situation is that the acquired knowledge and skills of surveyors varies widely depending on the level of experience gained through actual practice. The consequences are no uniformity of inspection procedures.

The PCG delegates its authority to the recognized classification societies to inspect/survey and give CI's to Philippine flag vessels. The capability of the MSE to conduct most of the above requirements for issuance of CI's is limited only to vessels of 250 GRT and below. To conduct surveys on vessels of 250 GRT and above is delegated to the recognized classification society. The reason behind this is obvious, the PCG surveyors not possessing the desired skills and knowledge to survey a vessel of 250 GRT and above, and thus their level of proficiency is not sufficient compared with the surveyors of classification society.

Aside from the surveyor's lack of knowledge and skills to carry out assigned tasks, in general, there are inadequate surveyors manning the maritime safety

department in each district to cope with the processing requirements in the registration and licensing of vessels within their respective area of responsibility. Table 4.6 shows the number of MSE as compared with the average number of Certificate of Inspection / Conditional Certificate of Inspection to be processed every month.

The inadequacy of surveyors is experienced most in the Districts where there is only one surveyor. In cases where the surveyor goes on leave or goes on mission outside his area of responsibility, the consequences will be a suspension of inspection activities in that area. Likewise, due to inadequacy of surveyors, an enlisted man (petty officer) who doesn't have the desired educational background may be called upon to conduct tonnage measurements for a vessel of 15 GRT and below.

Table 4.6 Monthly Processing of CI/CCI

PCG District	No. of CI/CCI	No. of Surveyors
1st CDG	288	9
2nd CDG	155	5
3rd CDG	145	3
4th CDG	70	1
5th CDG	30	1
6th CDG	69	1
7th CDG	12	1
8th CDG	27	1
<b>Total</b>	<b>1532</b>	<b>22</b>

Source: Philippine Coast Guard

Captain Victorino Vasco a former MARINA administrator describes what often happens when Coast Guard Inspectors check a vessel;

You probably have an enlisted man with no college education assigned to Manila to inspect ships. Most of these people have no experience in boarding and inspecting a commercial vessel... because he knows little, the inspector will probably approve the vessel for sailing even if it is not seaworthy.

Source: Philippine Daily Enquirer, Oct. 1, 1993

Inspections for the purposes of control verification are conducted regularly by the military personnel of the PCG. The purpose of this type of inspection is to determine the validity and the strict adherence of the party to the certificates issued by the PCG.

For domestic vessels a certificate issued has a validity prescribed by the national legislation. For a passenger ferry and cargo vessels, national legislation dictates that the validity of CI for a passenger vessel is 1 year and the validity for a cargo vessel is 2 years.

Once the certificate is issued and while the vessel is in operation within the validity period of the certificate, regular checks are conducted by the military personnel of the PCG. These regular checks as part of control verification are conducted to determine if the vessel is still seaworthy within the validity period of the certificate. In all cases, the PCG has the authority to board and inspect all domestic vessels at any time



whether on sea or in port to determine compliance with the applicable provisions of SOLAS MARPOL and national regulations.

But what usually happens when this military inspector boards a vessel is that the conduct of inspection is limited only to determine the validity of the certificate. The knowledge and skills to conduct actual surveys of SOLAS and MARPOL compliance are beyond their capability. Moreover, the educational background of these military personnel is from different disciplines. Most of them come from backgrounds which are not related to the maritime profession. Aside from this, they are mostly military oriented people and usually adhere to as a military professionals so that the level of maritime safety awareness is lacking. Owing to the rotational policy of the Philippine Navy of which the PCG is under its umbrella, the military safety inspectors of the said organization do not possessed the desired specialty to conduct surveys. This is due to the fact that the terms of the military inspectors in the PCG has a period of two years which is not enough for these maritime safety inspectors to achieved specialization in their job within the allotted time frame.

Gilbert Rueras, a former PCG Maritime Safety Officer commented that;

The knowledge and experience of Coast Guard personnel conducting this type of inspection is limited to recognition of the certificate as officially issued ...inspecting PCG personnel conducting this type of inspection neither has the

background or experience to determine if the vessel remains seaworthy within the effectivity of the certificates.

Source: Gilbert Rueras, WNU dissertation (1993)

Memorandum Circular number 02-92 of PCG authorizes the maritime safety personnel of PCG to conduct Port State Control (PSC) on all foreign vessels calling at Philippine ports and all domestic vessels operating within the jurisdiction of Philippine waters. PSC is conducted by the same military personnel of the PCG, the purpose of which is to enforce and implement relevant control provisions based on international conventions.

They conduct random inspection of vessels within the jurisdiction of the Philippine waters and enforce applicable regulation and provisions as prescribed in international conventions. But in reality, the conduct of port state control is done for formality sake only, meaning, verification is limited to certificate scrutiny and not within the actual context of safety inspection.

To put the foregoing comments in perspective, the proper procedures in the conduct of port state control may be summarized as follows:

1. Certificate verification
2. Determination of clear grounds on which the inspectors may go beyond verification of certificates to determine non-compliance to PSC.
3. Deficiency rectification
4. Detention
5. Reporting

The above procedures for PSC are laid down in most of the international conventions. As mentioned above, the capability of PCG's military surveyors is limited only to certificate verification. There is no way that all of the above procedures can be carried out due to the limitation of knowledge and skills regarding actual surveys which are necessary to determine deficiencies of ships. Ironically, the PCG will call upon the assistance of classification societies to conduct PSC on their behalf.

#### 4.6 IDENTIFIED PROBLEMS

This section identifies the problems of maritime safety enforcement and implementation in the Philippines. It is said that there are many factors to be considered leading to these problems as some of them cannot be quantified to determine their seriousness. But the author believes that by identifying the main root of the problem, a lasting solution can be achieved.

As discussed above, the Philippine Coast Guard is the maritime safety administration of the Philippines. This organization is the one which promulgates, administers, enforces and implements maritime safety rules and regulations within the maritime jurisdiction of the Philippines. The structure of the said organization and the country's maritime safety rules and regulations are substantially there to safeguard life and property at sea including the protection of the marine environment.

However, the essence of maritime safety lies in the enforcement and implementation of the country's maritime safety rules and regulations. Based on the analysis of the situation highlighted in this chapter, the maritime safety enforcement and implementation in the Philippines

is not effective enough to enforce the country's maritime safety rules and regulations. The main weakness of the said organization lies in its maritime safety personnel especially those people who are implementing and enforcing the said rules and regulations. As mentioned before, the maritime safety surveyors of the PCG are a mixture of civilian and military inspectors. In general, these people are incapable of discharging their duties and responsibilities effectively because of the following reasons:

The lack of knowledge and skills of the PCG personnel to efficiently and effectively carry out maritime safety functions and associated maritime safety duties. The author believes that this is the main root of the problems that render the maritime safety enforcement and implementation in the Philippines ineffective. Leading to this problem is that the PCG has no programs to upgrade the knowledge and skills of its surveyors and administrators. Likewise the educational background of these maritime safety personnel is from different disciplines, and it is important to have an appreciation and full understanding on the whole aspect of ships and the maritime environment.

Finally, the PCG is lacking in sufficient maritime safety surveyors especially nautical surveyors. This is demonstrated by the surveyors of the PCG who are not capable of surveying and inspecting life saving, fire fighting, and navigational equipment, nor of carrying out day to day processing of Certificates of Inspection.

## **CHAPTER 5**

### **EXPANDED POST GRADUATE PROGRAMS AT PMMA TO MEET FUTURE NEEDS**

The foregoing chapter identifies the problems of maritime safety enforcement and implementation in the Philippines. Having in mind this problem, the author believes that to achieve a lasting solution, the formalization of the training of maritime safety personnel in the Philippines is of utmost importance.

This chapter is devoted to developing post graduate programs on maritime safety at PMMA. The study in chapter 3 will be the basis for developing the curriculum of the programs in maritime safety. However to be more pertinent in answering the problems of maritime safety enforcement and implementation in the Philippines, the author will synthesize chapter 4 of this dissertation in order to come up with a most viable solution to the problems.

#### **5.1 AIM AND OBJECTIVES OF THE PROGRAMS**

In developing the curriculum for maritime safety, the formulation of aims and objectives of the program is essential as such, will provide guidance in planning the appropriate contents of the curriculum, learning opportunities and evaluation strategies for students.

The following aim and objectives as part of the curriculum intent will provide a clear direction on the curriculum that will be developed by the author.

**Aim :** To provide the Philippines with well trained and competent Maritime Safety Surveyors and Maritime Safety Administrators who will work towards the improvement, enforcement and implementation of maritime safety in the Philippines to meet international maritime safety standards.

**Objectives:**

1. To formalize the training of the country's maritime safety personnel by developing a post graduate program in Maritime Safety which will meet the needs of the country for well trained and competent maritime safety surveyors and administrators.

2. To equip maritime safety personnel with the necessary theoretical and technical background knowledge and skills to enable them to effectively and efficiently carry out maritime safety duties and functions.

3. To provide another avenue for the country's seafarers wishing to pursue a career on land.

**5.2 ADOPTION OF CURRICULUM STRUCTURE OF AMC AND WMU**

In structuring the curriculum of the programs that will be developed by the author, the following curriculum structure of WMU and AMC can be adopted or modified to ensure its applicability to the Philippine educational system.

1. The pyramidal structure of the courses at the AMC is an ideal approach to ensure continuity of education of the country's maritime safety surveyors leading to a higher level. The pyramidal structure is almost identical in the Philippine educational system differing only in respect to credit level achievement.

2. The framework of the post graduate courses at WMU which consists of course work, field study trips and dissertation can be adopted with certain modifications. The field study trips are applicable in the educational system of the Philippines since DECS on higher education requires students to undergo on the job training.

3. The program for the Maritime Safety Surveying course will be divided into separate streams; Nautical and Engineering streams identical to the MSA course at WMU.

4. The syllabus for the MSA course will be adopted with certain modifications to ensure its applicability to the Philippine scene.

5. The visiting professors scheme of WMU can be adopted to ensure specialization of the course.

As mentioned earlier, the design of the curriculum for the proposed post graduate programs at PMMA will adopt or modify the above stated guide-lines since it is suitable for inclusion in the educational system of the Philippines. Likewise, chapter 2 and 4 of this dissertation contain the situational analysis or diagnosis of needs which is important in structuring the curriculum of the programs for Maritime Safety.

It is expected that the candidates in this program will be drawn from different agencies (PCG, MARINA, private organization or governmental) associated mainly with maritime safety duties and related fields. In addition, the merchant marine officer who wants to pursue

a career on land is also expected as a candidate in this program.

### **5.3 PROPOSALS FOR THE POST GRADUATE PROGRAM AT PMMA**

Bearing in mind chapter 4 of this dissertation, there is a compelling need to provide solutions regarding the deficiency of the maritime safety surveyors identified in the said chapter. The author believes that the best solution lies in education. It is therefore essential to formalize the training of maritime safety personnel in the Philippines by developing programs that will equip them with the desired knowledge and skills to effectively carry out maritime safety duties and functions.

There are two ways to provide solutions to the problems discussed in chapter 4. The first solution is the development of a one year post graduate Diploma in Maritime Safety Surveying (MSS) that will immediately answer the pressing needs of the country to overcome the lack of sufficient maritime safety surveyors. The second is the development of a post graduate program for a Master of Science in Maritime Safety Administration (MSA) which will equip the country's maritime administrators to efficiently and effectively carry out administration functions and related duties.

#### **5.3.1 The Diploma in Maritime Safety Surveying (MSS)**

In consideration of the country's deficiency in the number of maritime safety surveyors, the one year diploma course in Maritime Safety Surveying will provide the immediate solution. The proposed course in Maritime Safety Surveying is a one year program that will constitute 2 semesters. The said courses will be offered



on a full time basis. However, in order to accommodate those applicants who are wishing to avail themselves of the programs but whose jobs restrict them from doing so, the schedule of classes will be held regularly on the following days:

Monday - 1800H to 2100H  
Wednesday - 1800H to 2100H  
Friday - 1800H to 2100H  
Saturday - 0900H to 1200H  
1300H to 1600H

Every meeting will have a 3 hours lecturing time except on Saturdays when 6 hours will be allotted, totalling 15 hours lecturing time every week. However, the total Class Contact Hours (CCH) and the syllabus content of the programs will be discussed later in this chapter. Upon successful completion of the said course, graduates will be awarded a Diploma in Maritime Safety Surveying Nautical or Engineering streams. Graduates of the said course will have the opportunity to finish the proposed MSc in Maritime Safety Administration within a further one year timeframe should the students decided to pursue their education to a higher level. This is made possible by the adoption of the pyramidal curriculum structure of AMC. But in general, the MSS is regarded as a stand alone course.

The following are the objectives for the diploma in Maritime Safety Surveying:

1. To provide the students with the specialized knowledge and skills required for the efficient and effective implementation of marine survey and associated maritime safety duties.

2. To know and understand the special provisions relating to surveys and inspection of ships, maritime casualties and competence of seafarers.

3. To build upon the operational and theoretical knowledge gained by the learners in the undergraduate programs by offering operational experience in maritime safety.

The diploma in Maritime Safety Surveying will be divided into two streams namely the Maritime Safety Surveying Nautical (MSSN) course specializing in nautical disciplines and the Maritime Safety Surveying Engineering (MSSE) course specializing in engineering disciplines. The decision to divide the MSS in to two emphasized specialization in both streams. Furthermore, it is intended that the MSSN will provide the answer to the lack of nautical surveyors in the country.

To be effective in providing the necessary knowledge and skills required of a maritime surveyor, the framework of the program will consist of coursework and field study trips.

The coursework will provide the students with the theoretical knowledge and skills to become efficient maritime safety surveyors. This coursework will consist of common, electives and specialized subjects. On the other hand, the field study trips will provide the students with an opportunity to apply the theoretical knowledge and skills that they acquired in the classroom. Furthermore, the field studies will give the students a greater understanding of the professional practice of

their profession. However, the duration and the weighting of field study trips is discussed later in this chapter.

### 5.3.1.1 Curriculum Content

Curriculum content is an aggregate of all knowledge, skills and values as reflected in the subject matter. As stated earlier, the syllabus for the MSA course at WMU will be adopted and modified to form the model syllabi for the Diploma in MSSN and MSSE respectively. All subjects under the model syllabus have been examined, evaluated and modified by the author to ensure that the theoretical knowledge that will be gained by the students in studying these subjects are pertinent to their needs.

Below is the outline syllabus for the Diploma Course in MSSN and MSSE.

## MARITIME SAFETY SURVEYING (NAUTICAL)

### FIRST SEMESTER

COMMON SUBJECTS	UNITS	HOURS
Maritime Safety Administration. . . . .	2	30
Principles of Management and Economics. . . . .	2	30
Maritime Law. . . . .	1	15
Application of Naval Architecture Mathematics. . . . .	<u>3</u>	<u>45</u>
<b>TOTAL . . . . .</b>	<b>8</b>	<b>120</b>
 <b>SPECIALIZED SUBJECTS</b>		
Maritime Safety Implementation I. . . . .	4	60
Maritime Safety Implementation II . . . . .	3	45
Maritime Transport of Cargoes . . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>9</b>	<b>135</b>

**ELECTIVES**

Maritime Communication. . . . .	1	15
Maritime Security . . . . .	1	15
Quality Assurance/ISO and other Standards. . . . .	1	15

**SECOND SEMESTER**

<b>COMMON SUBJECTS</b>	<b>UNITS</b>	<b>HOURS</b>
Law of the Sea. . . . .	1	15
Marine Environment Protection . . . . .	3	45
Naval Architecture II . . . . .	<u>3</u>	<u>45</u>
<b>TOTAL . . . . .</b>	<b>7</b>	<b>105</b>

<b>SPECIALIZED SUBJECTS</b>	<b>UNITS</b>	<b>HOURS</b>
Maritime Safety Implementation III. . . . .	4	60
Maritime Safety Implementation IV . . . . .	3	45
Maritime Transport of Cargoes . . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>9</b>	<b>135</b>

**ELECTIVES**

Maritime Communication. . . . .	1	15
Maritime Security . . . . .	1	15
Quality Assurance/ISO and other Standards. . . . .	1	15

**MARITIME SAFETY SURVEYING (ENGINEERING)**

**FIRST SEMESTER**

<b>COMMON SUBJECTS</b>	<b>UNITS</b>	<b>HOURS</b>
Maritime Safety Administration. . . . .	2	30
Principles of Management and Economics. . . . .	2	30
Maritime Law. . . . .	1	15

Application of Naval Architecture		
Mathematics . . . . .	<u>3</u>	<u>45</u>
<b>TOTAL . . . . .</b>	<b>8</b>	<b>120</b>

**SPECIALIZED SUBJECTS**

Maritime Safety Implementation I . . . . .	4	60
Maritime Safety Implementation II . . . . .	3	45
Ship Automation . . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>9</b>	<b>135</b>

**ELECTIVES**

Maritime Communication . . . . .	1	15
Maritime Security . . . . .	1	15
Quality Assurance/ISO and other Standards . . . . .	1	15

**SECOND SEMESTER**

<b>COMMON SUBJECTS</b>	<b>UNITS</b>	<b>HOURS</b>
Law of the Sea . . . . .	1	15
Marine Environment Protection . . . . .	3	45
Naval Architecture II . . . . .	<u>3</u>	<u>45</u>
<b>TOTAL . . . . .</b>	<b>7</b>	<b>105</b>

<b>SPECIALIZED SUBJECTS</b>	<b>UNITS</b>	<b>HOURS</b>
Maritime Safety Implementation III . . . . .	4	60
Maritime Safety Implementation IV . . . . .	3	45
Ship Machinery . . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>9</b>	<b>135</b>

**ELECTIVES**

Maritime Communication . . . . .	1	15
Maritime Security . . . . .	1	15
Quality Assurance/ISO and other Standards . . . . .	1	15

The above outline syllabus are designed to provide the students with a thorough understanding of the whole aspect of maritime safety implementation (see APPENDIX II for the breakdown of subjects in the outline syllabus). Subjects under these programs provide the students with a general background knowledge (common) as well as specialized knowledge in the aspect of maritime safety with special emphasis on the international regulations, conventions, surveys, certifications etc. which are needed to effectively carry out duties and function of the country's maritime safety surveyors. Moreover, the sequencing of the contents provides a gradual build-up of the acquired knowledge and skills and ensures continuity of learning. Aside from this, subjects are broken down into modules to be more specific in the delivery of topics. Likewise, the total Class Contact Hours on the proposed diploma programs allow full coverage of the curriculum content.

Table 5.1 and 5.2 below shows the CCH for the propose diploma courses at PMMA.

Table 5.1 Class Contact Hours (MSSN)

Semesters	Common	Specialized	Elective	Total
1st	120	135	15	270
2nd	105	135	15	225
Grand total	225	270	30	525

**Table 5.2 Class Contact Hours (MSSE)**

Semesters	Common	Specialized	Elective	Total
1st	120	135	15	270
2nd	105	135	15	225
Grand total	225	270	30	525

The total CCH indicated in the above figures are substantial to match the diploma programs mostly offered in other internationally recognize maritime institutions. Likewise, the total CCH on the said programs closely match the CCH of those maritime institutions offering a one year intensive master's degree course.

Aside from the above, part of the framework of the programs is the field study trips which prove to be successful in giving practical experience and application of theoretical knowledge gained by the students in the classroom. This is the special feature of the proposed diploma programs at PMMA. The field study trips will be held in various ports and organizations of the Philippines in co-ordination with the Philippine Coast Guard. This will be assessed on the basis of reports or assignments related to the activities and has a weighting of 20 marks out of 100 marks indicated in the grading system.

#### **5.1.2 Master of Science in Maritime Safety Administration (MSA)**

In the concept of Maritime Safety, the Engineering and Nautical surveying cannot be separated from each other. These two discipline have always had much in common. It is for this reason that the design of the syllabus for the Diploma in Maritime Safety Surveying is

almost the same. Considering this concept and the commonality of the two diploma programs, it is possible to bring these two streams together and try to build up the acquired theoretical knowledge and skills of the students in the Diploma programs to a single direction leading to a higher level of learning. The proposed Master of Science in Maritime Administration is the continuation of the program of the Diploma in Maritime Safety Surveying. This program will try to link these two streams together in the Master's Degree program and develop the students basic skills in management and administration with emphasis in Maritime Safety Administration. Furthermore, the model syllabus for MSA will provide more information to the students to be effective in administrating maritime safety. In general, the development of the program on MSc in Maritime Safety Administration is geared towards improving the management of the country's Maritime Safety Administration by providing the students with substantial knowledge and skills in management to effectively carry out maritime safety duties and functions.

The proposed MSc course in Maritime Safety Administration is a two years' program leading to the award of MSc Degree in Maritime Safety Administration upon completion of the program. However, holders of the Diploma in Maritime Safety Surveying will have the opportunity to complete the program within a one year timeframe.

The framework of the program will be part course work and part thesis writing. The coursework comprise primarily of common, specialized and elective subjects. However, the thesis requirements should be an original



piece of work and should embody scientific research. Every student has the right to choose his/her own topics within the scope of maritime safety and related fields. The allotted timeframe for the thesis writing will be one semester (5 months) giving due allowance for research, preparations and finalization of the work. However, in some other technicalities regarding thesis writing, the rules set by the PMMA post graduate school will apply.

Basically, the course will consist of four semesters for a total duration of two years. Similar to the proposed MSS course, the MSA will also be offered on a full time basis. The schedules of classes and number of lecture hours will follow the above schedules for the Diploma in Maritime Safety Surveying.

The following are the objectives for the MSc Degree in Maritime Safety Administration:

1. To build-up the students' basic knowledge of management by providing more material in the technical and operational side of management.
2. To provide the students with a substantial knowledge of legal technical, procedures and processes in the conduct of marine casualty investigation and inquiries.
3. To undertake in-depth study in the area of Maritime Safety Administration by engaging in graduate research.

### 5.3.2.1 Curriculum Content

The designed syllabus for the Diploma in Maritime Safety Surveying Nautical and Engineering streams has its element of commonality. Most of the subjects that are offered are almost the same except for the specialized courses in which the instruction is in Engineering or Nautical disciplines. Considering the common subjects offered in the diploma course which provide the basic principles of management, the syllabus for the Master of Science in Maritime Safety Administration will try to build this up to a desired level by providing the students with the technical and operational side of management with emphasis on Maritime Safety Administration. As mentioned before, the structuring of curriculum for the MSA will consider the study made in chapter 3 and 4 of this dissertation and the development of the syllabus should be pertinent to the need of the students.

Due to the fact that the structure of the program is pyramidal, the outline syllabus shown below is the year two, first semester of the proposed MSA program at PMMA.

#### MASTER OF SCIENCE IN MARITIME SAFETY ADMINISTRATION

##### FIRST SEMESTER

COMMON SUBJECTS	UNITS	HOURS
Management II . . . . .	2	30
Human Resource Management . . . . .	3	45
Management of Marine Technology . . . . .	3	45
Managerial Statistics . . . . .	2	30
Maritime Administration . . . . .	1	15
Research Methodology. . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>.13</b>	<b>195</b>

SPECIALIZED SUBJECTS	UNITS	HOURS
Maritime Casualty Inquiries, Investigation and Human Factors. . . . .	3	45
Implementation of Global and National Requirements for the Competency, Discipline and Welfare of Seafarers. . . . .	3	45
Maritime Law and Policy . . . . .	1	15
Planning and Response to Maritime Disaster. . . . .	<u>2</u>	<u>30</u>
<b>TOTAL . . . . .</b>	<b>9</b>	<b>135</b>

**ELECTIVES:**

International Environmental Issues. . . . .	1	15
Ship Maneuvering and Pilotage . . . . .	1	15
Ship Structure. . . . .	1	15

The designed syllabus for the above programs (see APPENDIX III) takes into consideration the syllabus of the MSS which ensures build up of knowledge. Likewise, the author takes into account the objectives of the program which is to provide a substantial amount of management in the operational and technical side. In addition, the learnability of the subjects in the syllabus is adaptable to the students of the programs in the diploma course. Moreover, the designed syllabus is also guided by the study conducted in chapter 3 and 4 of this dissertation.

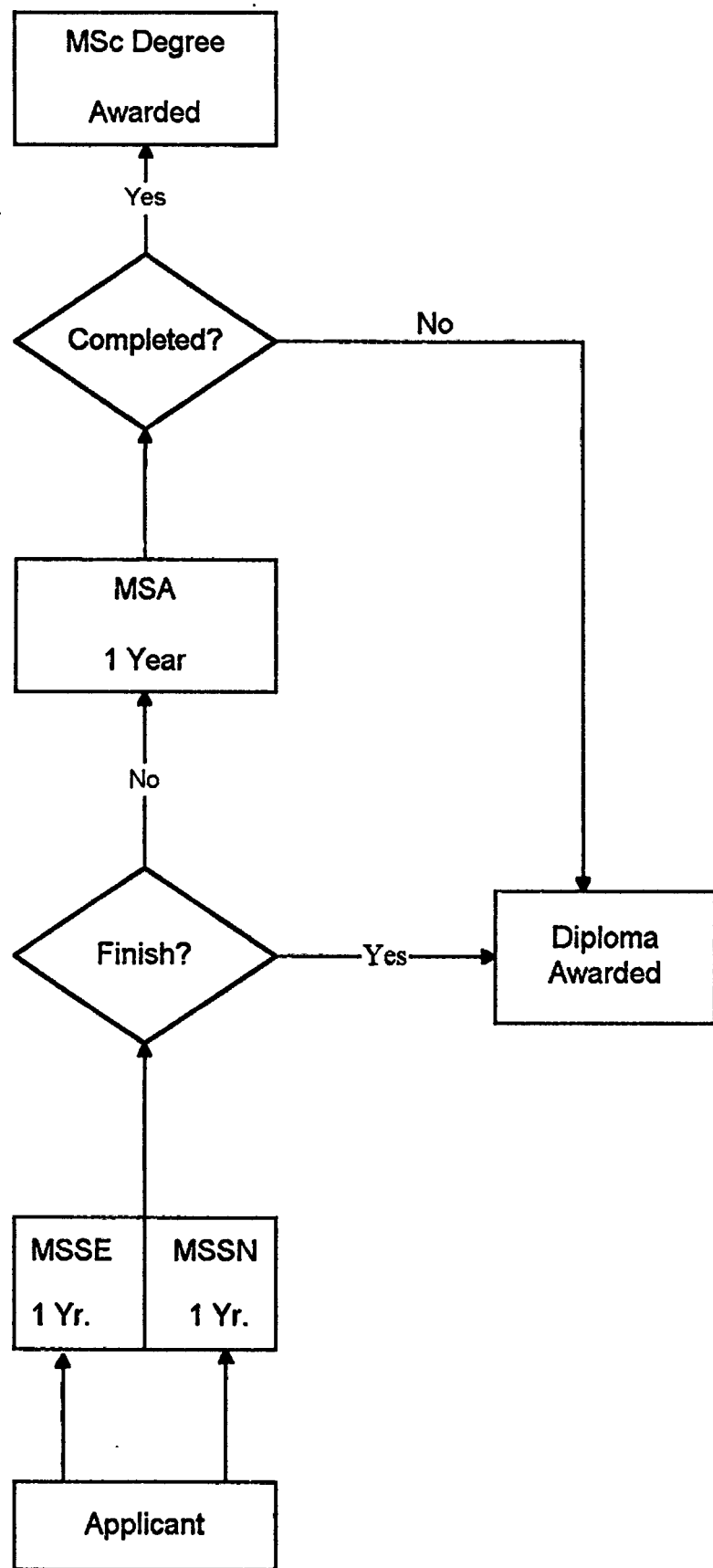
The CCH of MSA in the year one of the program is represented by the CCH of the diploma program. However, the CCH of the MSA in the year two of the program is represented in table 5.3 below.

**Table 5.3 Class Contact Hours (MSA)  
(Year Two)**

Semesters	Common	Specialized	Elective	Total
1st	195	135	15	345
2nd	Thesis Writing			
Grand total	195	135	15	345

However, combining the total CCH in year one of the MSA (diploma program) which is 525 with that of the year two of the said course, the resulting figures will be 870 total Class Contact Hours comparable enough to the 2 years post graduate programs offered at some other internationally recognized maritime institutions. On the other hand, to understand further the pyramidal structure of the proposed programs, figure 5.1 below shows how the diploma program is bridged to the master of science degree.

Fig. 5.1 Pyramidal Structure of Proposed Post Graduate Program at PMMA



#### 5.4 ENTRY LEVEL REQUIREMENTS

As mentioned before, most of the applicants for the Diploma in Maritime Safety Surveying and Master of Science in Maritime Safety Administration will be drawn from the different agencies in the Philippines, governmental or private, that are associated with maritime safety duties and functions. It is expected that the highest qualifications held by applicants enrolling in either of the programs will be a Masters Degree in non-related discipline or a Bachelors Degree with experience in the field of maritime safety. On the other hand, the lowest qualification held by applicants who will be enrolling in the said programs will be an Associate Degree (below the level of Bachelors Degree) in maritime and related fields. Considering these two extremes, entry level requirements can be formulated based on the said qualifications.

The following are the entry level requirements for the Diploma in Maritime Safety Surveying and the Master of Science in Maritime Safety Administration.

1. Bachelor of Science in Maritime Transportation (BSMT) or Bachelor of Science in Marine Engineering (BSME) with substantial experience at sea.
2. Bachelors Degree in maritime related fields with substantial experience at sea or in the field of maritime safety.
3. Practitioner in the field of maritime safety provided that he/she is a holder of Bachelor Degree.

4. Associate Diploma in maritime and related field with substantial experience at sea or maritime safety related duties will be accepted provided that he/she is willing to undertake classes in the undergraduate study at PMMA.

#### 5.5 LEARNING ACTIVITIES

The learning activities are essential in the curriculum since they provide the best possible guidance to the lecturers who will implement the curriculum. There is a variety of learning activities that can be employed in either of the proposed post graduate programs which will enable the students to cover the designated content of the curriculum thereby achieving the stated objectives.

The Diploma in Maritime Safety Surveying and the Master of Science in Maritime Safety Administration are job oriented programs requiring specialty and mastery of the course. Taking into account the curriculum intent of the said programs and the situational analysis in the foregoing chapter, the learning activities that will be employed can be the combination of the following:

1. Interactive teaching - This approach encourages interaction between learners and teachers, enhances feedback from the students and develops thinking skills. Interactive teaching may take the form of tutorials, seminars and group discussion.

2. Small group teaching/discussion - This method involves the division of a class into small groups which work independently to achieve specific goals. In the process of achieving goals students will develop the

skills of planning, organizing work, developing arguments, sharing knowledge, dividing tasks, adopting compromise positions, etc. Small group teaching / discussion may take the form of group discussion, 'buzz' groups and small seminars.

3. Models of reality - This is an effective way to facilitate effective learning within the students. This involves the replication of a real life scenario in which the students are totally involved. This is relatively important in supplementing the field study trips of the Diploma programs. Models of reality may take the form of physical models, work models, games and role playing.

4. Expository Teaching - This involves the transmission of information in a single direction, from the lecturers to the students. There are many limitations to the expository method, but it is impossible to discard this method since there are instances that the number of students will be bigger and to some extent the methods that are described previously will not be applicable. However, this method is very useful in giving lectures to a large number of students. With the efficiency and effectiveness of the lecturers and the resources available this limitation can be overcome. Expository teaching may take the form of lectures, demonstrations, set reading tasks and audio-visual presentation.

It should be noted that the use of any of the above methods will depend much on the lecturer's professional understanding of the task at hand and the needs of the students.



## 5.6 THE VISITING PROFESSORS SCHEME

Looking at the profiles of PMMA teaching staff, the PMMA has among its faculty members 4 Master's Degree holders from the World Maritime University. In addition, PMMA counts among its faculty a Doctoral and Master's Degree holder in the field of education. However, taking into account the division of the subject in the curriculum content of the above programs, most of the common subjects can be handled by the teaching staff of the academy. On the other hand, the capabilities of the said teaching staff of the academy to handle subjects will be limited only in their area of specialization. It is important to note in this respect that the 4 graduates of WMU are holders of Maritime Education and Training degrees. It is impossible for them to handle the specialized subjects in the proposed post graduate programs. However, to solve this problem, the visiting professors scheme will be formulated. It is expected that this scheme will provide the academy with specialized people in the maritime safety fields to handle the specialized subjects in the said programs. In addition, there are now more than 8 Maritime Safety Administration graduates of WMU who hold high positions in the Philippine Maritime Safety Administration. If these graduates can be utilized, they are in the best position to lecture in specialized courses.

## 5.8 GRADING SYSTEM

Evaluation of the students performances is important in order to determine if the students are attaining the aim and objectives of the programs. In the proposed post graduate programs, assessments may take the form of examinations, assignments, reports, practicals works, etc. It should be noted that the criteria for the grading

system that will be formulated herein is for the Diploma programs only and will work in conjunction with the grading system of PMMA.

Considering the framework of the Diploma in Maritime Safety Surveying the ideal weighting of each of the elements will be as follows:

1. The maximum grade achievements that the students can attain in any type of the assessments is 100 percent.

2. Assessments of students will constitute two criteria; course work and field study programs.

3. Since the course work carries more weight compared to field study programs, 80 percent of total marks in course works will be counted towards the Cumulative Grade Average (CGA) of the student.

4. The field study programs will carry 20 percent of total marks for counting towards the Cumulative Grade Average (CGA) of the student.

To understand this further, take for example student Y who achieved a CGA of 85% in the course work and a CGA of 90% in the field study in the first semester. Using the criteria indicated in number 3 and 4 respectively, we can come up with the final grade for student Y. Table 5.4 below shows the over all grade of student Y in the first semester.

Table 5.4 Criteria for Evaluation of Grade

Frame Work	CGA	Weighting	Total
Course Work	85	80%	68
Field Study Trips	90	20%	18
Grade of Y 1st Semester			86%

However, in determining progression and awards for the Master of Science in Maritime Safety Administration and the Diploma in Maritime Safety Surveying, the PMMA progression and award rules discussed in chapter 2 of this dissertation will be followed.

## CHAPTER 6

### CONCLUSION AND RECOMMENDATIONS

It is evident based on the investigation conducted in this dissertation, that the weakness of maritime safety in the Philippines lies in the lack of enforcement and implementation. While the increasing number of tragedies occurring at sea emphasizes the need for a high level of safety, the present condition of maritime safety in the Philippines is not satisfactory. This is brought about by the knowledge and skills of the country's maritime safety surveyors which in general are not sufficient to fully enforce and implement maritime safety rules and regulations. There is no doubt that the present condition of maritime safety in the Philippines warrants the need for well trained and competent maritime safety personnel. In addition, there has not been an attempt by the maritime institutions in the Philippines to think in the broader sense that the answer to this need lies within their scope: education.

With the formalization of maritime safety in the Philippines, this problem will be a thing of the past. The PMMA as a reputable institution in giving quality education will take the lead in this endeavour. Since the PMMA is already offering some post graduate studies, the organizational structure of the academy is already well in place, and it is only a matter of implementing the new curriculum for maritime safety to set it in motion.

However, if the curriculum is to be successfully implemented, the support of the institution will play a vital role. Likewise, a deliberate strategy to implement the curriculum should be developed.

Considering the above, it is the author's view that the following recommendations, highlight the most important points for the effective and immediate implementation of the new curriculum. It is recommended that:

1. A memorandum order adopting the new post graduate program into the curriculum of the academy be made in order to require each concerned department at PMMA to work together to achieve common objectives.

2. A program committee headed by the Dean of the graduate school be created to look into matters concerning the implementation of the new program. Within the scope of its responsibility, the committee should look into matters concerning financing, additional facilities and staff, teaching aids, books etc. in order to run the program. Moreover, the committee should have the power to recommend to the President of the Academy on matters concerning the new program.

3. The Department of Research, under the guidance of the Dean of post graduate school promote and publish to all concerned organizations including the public, the offering of such courses at PMMA.

4. A Curriculum Review Committee should be created in order that the curriculum of the new program keeps in phase with the rapid changes in the maritime world. Composed mainly of the faculty of PMMA, it should have the responsibility to make changes as necessary to the curriculum which will reflect new developments in the maritime world.

5. A Curriculum Board should be created as a first step in the process of institutionalizing the program. The said board should be composed of representatives from the Philippine Coast Guard (PCG), Maritime Industry Authority (MARINA), Department of Education Culture and Sports (DECS), Philippine Registry of Shipping (PRS) and the Philippine Association of Maritime Institutions (PAMI). They are basically the organizations directly connected with maritime safety and maritime education. It is expected that by initiating this first step, the curriculum will eventually gain recognition and support from the maritime sector.

**APPENDIX I**

# MARITIME SAFETY ADMINISTRATION

## Course objectives

The Maritime Safety Administration course is designed to provide students with the knowledge and skills required for the efficient and effective administration of marine survey and associated maritime safety duties, including the protection and preservation of the marine environment.

Many WMU graduates are quickly promoted to senior positions, involving substantial amounts of administrative and policy development work, and the curriculum has been designed to reflect these demands. The course is intended for people serving in, or to be appointed to, a position involving administration of marine survey or associated maritime safety activities. Students gain a thorough knowledge of maritime safety, environment protection and related requirements, together with associated

administrative and policy-advising responsibilities. There is special emphasis on those provisions relating to the survey and inspection of ships, maritime casualties, competence of seafarers and environmental protection.

Common studies for students with both nautical and engineering backgrounds are provided. Additionally, students gain specialist knowledge of the applications of their separate nautical and marine engineering skills.

## Entrance requirements

### Qualifications

the highest grade certificate of competency for unrestricted service as master mariner or chief engineer or equivalent, together with evidence of the academic ability to pursue the course successfully,

or

a degree in a relevant nautical, maritime studies or engineering discipline,

or

equivalent qualifications and experience.

### Experience

substantial relevant experience

### 11-month programme

Applicants who wish to be granted advanced standing to allow them to join the 11-month programme must demonstrate that they have progressed beyond the level achieved by entrants to the two-year course. Please refer to page 7 for details of how to apply for advanced standing.

In the pages that follow, the 11-month programme is described separately from the standard, 20-month course. If a first or second semester subject is also taught to students with advanced standing, in some cases in a modified form, this is listed in the sections detailing the 11-month programmes, and is indicated by the prefix 'A' in its subject code. The prefix 'A' is also used to indicate special subjects designed to be followed only by students with advanced standing.

## 20-MONTH MSc COURSE with Marine Engineering and Nautical Streams

### YEAR 1 - SEMESTER 1

#### Common Subjects for Both Streams

<b>MSA 101</b>	<b>Maritime Administration - International and National Organizations</b>	<b>(69 hrs)</b>
<b>Aim :</b>	To give a general understanding of the UN System, UN Agencies and other international organizations concerned with shipping and ports, together with a thorough knowledge of the objectives and work of the International Maritime Organization and the associated functions of national maritime administrations, especially the maritime safety administration.	
<b>Modules :</b>	<b>ADM 100</b>	<b>United Nations System and Relevant International Organizations (27 hrs)</b>
	<b>ADM 101</b>	<b>IMO, the Organization and Its Work (18 hrs)</b>
	<b>ADM 102</b>	<b>Maritime Administration/Maritime Safety Administration (12 hrs)</b>
	<b>ADM 106</b>	<b>Registration of Ships ( 6 hrs)</b>
	<b>ADM 107</b>	<b>Maritime Safety Administration ( 6 hrs)</b>
<b>Assessment :</b>	Examinations	



**MSA 102 Principles of Management and Economics (33 hrs)**

**Aim :** To review the fundamentals of management and economics, and apply these to maritime transportation and commerce.

**Modules :** ADM 104 Principles of Management (15 hrs)  
ECO 100 Maritime Economics I (18 hrs)

**Assessment :** Examinations and assignments

**MSA 103 Utilization of the Sea (36 hrs)**

**Aim :** To introduce the basic physical and biological divisions and characteristics of coasts and oceans, providing a broad understanding of the complications of multiple sea uses and sustainable development together with the relevant global agreements.

**Modules :** ENV 100 Principles for Utilization of the Sea (15 hrs)  
ENV 101 Scientific Background to Global Agreements on the Marine Environment (21 hrs)

**Assessment :** Examinations or assignments

**MSA 104 Maritime Law (51 hrs)**

**Aim :** To provide the foundation to appreciate the complex body of maritime law derived from international conventions, codes and guidelines, and complemented by maritime custom and practice.

**Modules :** LAW 100 International Maritime Conventions and Codes (15 hrs)  
LAW 103 Maritime Law (36 hrs)

**Assessment :** Examinations and assignments

**MSA 108 Research Methodology and Computing Technology (24 hrs)**

**Aim :** To familiarize students with relevant research methodology, including library information sources and computer systems.

**Modules :** EDR 100 Information Technology and Computer Applications (15 hrs)  
EDR 102 Research Methodology and Information Systems (9 hrs)

**Assessment :** Not assessed

**Marine Engineering Stream**

**MSAE 101 Applications of Mathematics and Naval Architecture (33 hrs)**

**Aim :** To apply mathematical principles to ship technology with particular emphasis on learning applications.

**Modules :** TEC 101 Naval Architecture (15 hrs)  
TEC 114 Applied Mathematics (18 hrs)

**Assessment :** Examinations

**MSAE 102 Maritime Safety Implementation I (55.5 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.

**Modules :** MS 100 Procedures/Processes for Surveys and Certification (24 hrs)  
MS 101 Life Saving Appliances - Regulations/Surveys I (9 hrs)  
MS 103 Personal Safety, Delegated Statutory Surveys and Survey and Procedures of Hull, Machinery and Load Line (10.5 hrs)  
MS 105 Fire Protection and Fire Appliances I - Regulations/Survey/Approval, etc. (12 hrs)

**Assessment :** Examinations

**Nautical Stream**

**MSAN 101 Applications of Mathematics and Naval Architecture (27 hrs)**

**Aim :** To apply mathematical principles to ship technology with particular emphasis on learning applications.

**Modules :** TEC 101 Naval Architecture (15 hrs)  
TEC 114 Applied Mathematics (12 hrs)

**Assessment :** Examinations and assignments

**MSAN 102 Maritime Safety Implementation I (58.5 hrs)**

**Aim :** To enable the students to implement the international and national maritime safety requirements on behalf of their respective administrations.

**Modules :**

MS 100	Procedures/Processes for Surveys and Certification	( 6 hrs)
MS 101	Life Saving Appliances - Regulations/Surveys I	(21 hrs)
MS 104	Navigation Equipment - Regulations/Inspection/Approval, etc	( 4.5 hrs)
MS 105	Fire Protection and Fire Appliances I - Regulations/Survey/Approval, etc.	(12 hrs)
MS 106	Personnel Safety and Welfare - Crew Accommodation and related matters, including Medical Scales - Regulations/ Inspection, etc.	( 4.5 hrs)
MS 107	Navigation, Lights, Shapes and Sound Signals (COLREG) - Regulations/Survey/ Approval, etc.	(10.5 hrs)

**Assessment:** Examinations

**Total 1st Semester Class Contact Hours**

	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
<b>Marine Engineering Stream</b>	252	49.5	301.5
<b>Nautical Stream</b>	252	46.5	298.5

**YEAR 1 - SEMESTER 2**

**Common Subjects for Both Streams**

**MSA 201 Law of the Sea (21 hrs)**

**Aim :** To provide knowledge of the main provisions of the UN Convention on the Law of the Sea, 1982; its importance, impact on shipping and the direct relevance of the Convention to the role of IMO and its conventions.

**Modules :** LAW 500 Law of the Sea (21 hrs)

**Assessment :** Examinations

**MSA 202 Principles and Practice for Maritime Activities (21 hrs)**

**Aim :** To develop understanding of the approaches that maritime administrations have taken to current issues within shipping and to environmental policy decisions.

**Modules :** ADM 206 Maritime Administration Seminar (21 hrs)

**Assessment :** Assignments

**MSA 203 Marine Environment Protection I (12 hrs)**

**Aim :** To enable students to implement the international and national requirements for marine environment protection on behalf of their respective administration.

**Modules :**

ENV 204	Regulations, Procedures/Processes for Surveys and Certification	( 6 hrs)
ENV 205	Contingency Planning to Combat Pollution - Human Factors	( 6 hrs)

**Assessment :** Assignments

**Marine Engineering Stream**

**MSAE 201 Naval Architecture II (30 hrs)**

**Aim :** To provide knowledge of the stability and structural strength of ships in the context of maritime safety.

**Modules :**

TEC 221	Stability of Ships	(15 hrs)
TEC 222	Structural Strength of Ships	(15 hrs)

**Assessment :** Examinations

**MSAE 202 Maritime Safety Implementation II (46.5 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their administrations.

**Modules :**

MS 200	Load Line Convention and Related Matters	( 6 hrs)
MS 201	Structure and Roles of MSAs in Advanced Countries I	( 4.5 hrs)
MS 202	Developments in Safety Management in Companies and Ships	( 3 hrs)

MS 203	Fire Protection, Detection and Extinction and Related Surveys	(30 hrs)
MS 204	Port State Control I	( 3 hrs)

Assessment : Examinations and assignments

**MSAE 203 Ship Machinery and Automation (61.5 hrs)**

Aim : To develop understanding of the theory and applications of ship machinery and machinery automation system.

Modules :	TEC 217	Introduction to Digital Control	( 7.5 hrs)
	TEC 228	Automation and Control Systems I	(24 hrs)
	TEC 220	Ship Machinery	(30 hrs)

Assessment : Examinations and assignments

**MSAE 204 Maritime Communications (15 hrs)**

Aim : The objectives, operations and capabilities of the International Maritime Satellite System.

Module :	TEC 213	Maritime Communications	(15 hrs)
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Assessment : Examinations

### *Nautical Stream*

**MSAN 201 Naval Architecture II (21 hrs)**

Aim : To provide knowledge of the stability and structural strength of ships in the context of maritime safety.

Modules :	TEC 221	Stability of Ships	(15 hrs)
	TEC 222	Structural Strength of Ships	( 6 hrs)

Assessment : Examinations

**MSAN 202 Maritime Safety Implementation II (75 hrs)**

Aim : To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.

Modules :	MS 200	Load Line Convention and Related Matters	( 6 hrs)
	MS 201	Structure and Roles of MSAs in Advanced Countries I	( 9 hrs)
	MS 202	Developments in Safety Management in Companies and Ships - Human Factors	( 3 hrs)
	MS 204	Port State Control I	( 3 hrs)
	MS 205	Safety of Special Types of Ships	( 6 hrs)
	MS 206	Safety of Fishing Vessels	( 4.5 hrs)
	MS 207	Occupational Safety - Human Factors	( 4.5 hrs)
	MS 208	Safety of MODUs	( 6 hrs)
	MS 209	Fire Protection and Fire Appliances II - Fire Protection, Detection and Extinction and Related Surveys	(30 hrs)
	MS 210	Contingency Planning for SAR	( 3 hrs)

Assessment : Examinations and assignments

**MSAN 203 Maritime Transport of Cargoes (39 hrs)**

Aim : To enable students to implement international and national maritime safety requirements on behalf their respective administrations.

Modules :	ENV 203	Maritime Transport of Dangerous Cargoes	(21 hrs)
	TEC 215	Carriage of Bulk and Special Cargoes	(18 hrs)

Assessment : Examinations

**MSAN 204 Safety of Navigation I (31.5 hrs)**

Aim : To provide foundation knowledge of matters relevant to safety of navigation, including maritime communications with emphasis on human factors.

Modules :	MS 211	Hydrographic Surveys and Chart Productions	(13.5 hrs)
	MS 212	MSAs' Roles in Wrecks and Salvage	( 3 hrs)
	TEC 213	Maritime Communications	(15 hrs)

Assessment : Examination and assignments

**Total 2nd Semester Class Contact Hours**

	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
Marine Engineering Stream	115.5	91.5	207
Nautical Stream	115.5	105	220.5

**YEAR 2 - SEMESTER 3**

**Common Subjects for Both Streams**

<b>MSA 301</b>	<b>Maritime Security</b>	<b>(15 hrs)</b>
Aim :	Familiarization with the contents and purposes of the International Convention for the Suppression of Unlawful Acts against Safety of Maritime Navigation, 1988, and with the measures to be planned and implemented to achieve the purposes.	
Module :	ADM 301 Maritime Security	(15 hrs)
Assessment :	Not assessed	
<b>MSA 302</b>	<b>Marine Environment Protection II</b>	<b>(22.5 hrs)</b>
Aim :	To enable students to implement international and national requirements for marine environment protection on behalf of their respective administrations.	
Modules :	ENV 307 Oil Tanker Safety and Pollution Prevention - Regulations, Surveys and Certification Procedures	(22.5 hrs)
Assessment :	Assignments	
<b>MSA 303</b>	<b>Maritime Casualty Inquiries/Investigations and Human Factors</b>	<b>(45 hrs)</b>
Aim :	To provide a full understanding of roles, responsibilities and functions in the field of maritime casualties with emphasis on human factors.	
Modules :	LAW 301 Maritime Casualty Investigations - Legal Aspects	(15 hrs)
	TEC 300 Maritime Casualty Investigations - Technical Aspects	(15 hrs)
	MS 326 Processes, Procedures and Documentation for Conducting Maritime Casualty Inquiries/Investigations and Follow-up	(15 hrs)
Assessment :	Examinations and assignments	

**Marine Engineering Stream**

<b>MSAE 301</b>	<b>Maritime Safety Implementation III</b>	<b>(163.5 hrs)</b>
Aim :	To enable students to implement international and national maritime safety requirements on behalf of their respective administrations, with emphasis on human factors.	
Modules :	MS 303 Procedures for Surveys and Certificates	( 6 hrs)
	MS 304 Life Saving Appliances - Survey/Approval, etc.	( 9 hrs)
	MS 306 Plan Approval Procedures by MSA and Class Societies	(12 hrs)
	MS 307 Approval of Stability Information for Ships	(13.5 hrs)
	MS 308 Maintenance of Class - In-Service Inspection	( 6 hrs)
	MS 309 Safety Management System and Emergency Drills	(15 hrs)
	MS 310 Tonnage Measurement	(22.5 hrs)
	MS 311 Load Line Surveys	( 4.5 hrs)
	MS 312 Safety of Light and High Speed Craft	(13.5 hrs)
	MS 313 Log Books and Other Official Records	( 6 hrs)
	MS 314 Maintenance of Ships and Machinery	(15 hrs)
	MS 315 Port State Control II	( 6 hrs)
	MS 316 Structure and Roles of MSAs in Advanced Countries II	(12 hrs)
	MS 317 Ship Classification Societies - their Delegated Roles on Behalf of Administrations	(10.5 hrs)
	MS 318 Marine Electric Machinery Construction, Operation and Safety Aspects	(12 hrs)
Assessment :	Examinations and assignments	

**MSAE 302 Implementation of Global and National Requirements for the Competency, Discipline and Welfare of Seafarers (36 hrs)**  
**Aim :** To enable maritime safety, safety of navigation and protection of the marine environment to be ensured through the proper competence and employment of officers, key ratings etc.

**Modules :** MS 322 Examination and Certification of Engineering Officers (15 hrs)  
 MS 327 Manpower Planning, Manning Patterns and Identification/Monitoring of Relevant Training Schemes and Quality Assurance/Audit (15 hrs)  
 MS 328 Seafarers' Employment, Welfare, Discipline and Related Matters - Human Factors ( 6 hrs)

**Assessment :** Examinations and assignments

***Nautical Stream***

**MSAN 301 Maritime Safety Implementation III (150 hrs)**  
**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations with emphasis on human factors.

**Modules :** MS 303 Procedures for Surveys and Certificates ( 6 hrs)  
 MS 304 Life Saving Appliances - Survey/Approval, etc ( 9 hrs)  
 MS 305 Navigation Lights, Shapes and Sound Signals (COLREG) - Survey/Approval, etc ( 4.5 hrs)  
 MS 307 Approval of Stability Information for Ships (13.5 hrs)  
 MS 309 Safety Management System and Emergency Drills ( 6 hrs)  
 MS 310 Tonnage Measurement (22.5 hrs)  
 MS 311 Load Line Surveys ( 4.5 hrs)  
 MS 312 Safety of Light and High Speed Craft (13.5 hrs)  
 MS 313 Log Books and other Official Records ( 6 hrs)  
 MS 315 Port State Control II ( 6 hrs)  
 MS 316 Structure and Roles of MSAs in Advanced Countries II (12 hrs)  
 MS 317 Ship Classification Societies - their Delegated Roles on Behalf of Administrations (18 hrs)  
 MS 323 Navigation Equipment and Bridge Design - Inspection/Approval, etc. ( 9 hrs)  
 MS 324 Maritime Search and Rescue ( 9 hrs)  
 MS 325 Safety Training/Manuals, Instructions and Muster Lists - Approval ( 9 hrs)

**Assessment:** Examinations and assignments

**MSAN 302 Implementation of Global and National Requirements for the Competency, Discipline and Welfare of Seafarers (48 hrs)**

**Aim :** To enable maritime safety, safety of navigation and protection of the marine environment to be ensured through the proper competence and employment of officers, key ratings etc., with emphasis on human factors.

**Modules :** MS 330 Examination and Certification of Masters and Deck Department Personnel (27 hrs)  
 MS 327 Manpower Planning, Manning Patterns and Human Factors, Identification/Monitoring of Relevant Training Schemes, Quality Assurance/Audit (15 hrs)  
 MS 328 Seafarers' Employment, Welfare, Discipline and Related Matters - Human Factors ( 6 hrs)

**Assessment :** Examinations and assignments

<b>Total 3rd Semester Class Contact Hours</b>			
	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
Marine Engineering Stream	222	60	282
Nautical Stream	222	58.5	280.5

**YEAR 2 - SEMESTER 4**

***Common Subjects for Both Streams***

**MSA 401 Environment, Policy and Management (42 hrs)**

**Aim :** To solve problems through team-work and the use of various disciplines in a group of seminars and workshops, with emphasis on human factors.

**Modules :** ADM 404 Maritime Disaster Workshop - Human Factors (21 hrs)  
 ECO 400 Maritime Commercial Policy Seminar (21 hrs)

**Assessment :** Assignments

### Marine Engineering Stream

**MSAE 401 Quality Control and Quality Assurance (22.5 hrs)**

**Aim :** To examine the properties of ship material, various testing procedures, destructive and non-destructive testing, quality control, the principles of quality assurance systems and other international standards.

**Modules :**

TEC 406	Materials, Testing of Materials and Non-Destructive Examination	(12 hrs)
TEC 407	ISO and Other Standards	( 4.5 hrs)
TEC 408	Quality Assurance	( 6 hrs)

**Assessment :** Examinations or assignments

**MSAE 402 Maritime Safety Implementation IV (28.5 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.

**Modules :**

MS 400	Structure and Roles of MSAs in Advanced Countries III	( 9 hrs)
MS 401	Agreement and Contracts between Maritime Administrations and Classification Societies	(12 hrs)
MS 402	Noise and Vibration Problems On Board Ships	( 7.5 hrs)

**Assessment :** Assignments

### Nautical Stream

**MSAN 401 Safety of Navigation II (19.5 hrs)**

**Aim :** To provide foundation knowledge of matters relevant to safety of navigation.

**Modules :**

MS 403	Pilotage and Manoeuvring of Ships	(16.5 hrs)
MS 404	Port Safety as Related to Ship-Port Interface	( 3 hrs)

**Assessment :** Assignments

**MSAN 402 Maritime Safety Implementation IV (31.5 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.

**Modules :**

MS 400	Structure and Roles of MSAs in Advanced Countries III	( 9 hrs)
MS 401	Agreement and Contracts between Maritime Administrations and Classification Societies	(12 hrs)
TEC 407	ISO and other Standards	( 4.5 hrs)
TEC 408	Quality Assurance	( 6 hrs)

**Assessment:** Assignments

#### Total 4th Semester Class Contact Hours

	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
Marine Engineering Stream	73.5	19.5	93
Nautical Stream	73.5	19.5	93

### FIELD STUDIES

One of the unique features of the courses offered at WMU is the specialized field studies and on-the-job training programmes undertaken by students primarily during their second year of study. The purpose of these programmes is to provide meaningful applications of a student's theoretical studies.

Though the programmes vary according to the differing requirements of each course, all students are given the opportunity to visit administrations, institutions, ports and companies in a number of countries, to enable them to gain valuable insight into and experience of the professional maritime practices found in these countries.

### DISSERTATION

During the programme, each student is required to complete a dissertation on a topic related to the course of study. Desirably the topic chosen will be related to a particular problem or matter bearing on the development of the maritime infrastructure of the student's home country.

The dissertation can involve original primary research, or an assessment or re-assessment of a topic based on secondary sources and should demonstrate evidence of the student's ability to select and review material, to analyze, evaluate and synthesize ideas and to draw relevant conclusions.

The award of the MSc degree depends upon satisfactory completion of the dissertation, to which one-fifth of the course mark is allocated.

**SUMMARY OF TOTAL CLASS CONTACT HOURS**

	<i>Marine Engineering</i>			<i>Nautical</i>		
	Common	Stream Specific	Total	Common	Stream Specific	Total
Semester 1	252	49.5	301.5	252	46.5	298.5
Semester 2	115.5	91.5	207	115.5	105	220.5
Semester 3	222	60	282	222	58.5	280.5
Semester 4	73.5	19.5	93	73.5	19.5	93
<b>TOTAL:</b>	<b>663</b>	<b>220.5</b>	<b>883.5</b>	<b>663</b>	<b>229.5</b>	<b>892.5</b>

**11-MONTH PROGRAMME FOR STUDENTS WITH ADVANCED STANDING  
with Marine Engineering and Nautical Streams**

**SEMESTER 1**

**Common Subjects for Both Streams**

<b>MSA 350A</b>	<b>Introduction to Advanced Maritime Studies</b>	<b>(51 hrs)</b>
<b>Aim :</b>	To provide a comprehensive overview and update of important elements of maritime studies.	
<b>Modules :</b>	ADM 100A United Nations System and Relevant International Organizations	( 3 hrs)
	ADM 101A IMO, the Organization and its Work	(12 hrs)
	ECO 100A Maritime Economics I	( 9 hrs)
	EDR 102A Research Methodology and Information Systems	( 9 hrs)
	ENV 104A Marine Affairs and Environmental Management	( 9 hrs)
	LAW 104A Principles of Law and Law of the Sea	( 9 hrs)
<b>Assessment :</b>	Examination and assignment	
<b>MSA 101A</b>	<b>Maritime Administration / Maritime Safety Administration</b>	<b>(21 hrs)</b>
<b>Aim :</b>	To give a general understanding of the functions of national maritime administrations, especially the maritime safety administration.	
<b>Modules :</b>	ADM 102 Maritime Administration/Maritime Safety Administration	(15 hrs)
	ADM 106 Registration of Ships	( 6 hrs)
<b>Assessment :</b>	Examinations or assignments	
<b>MSA 104A</b>	<b>Maritime Conventions and Codes</b>	<b>(15 hrs)</b>
<b>Aim :</b>	To provide a general understanding of international conventions, codes and guidelines.	
<b>Module :</b>	LAW 100 International Maritime Conventions and Codes	(15 hrs)
<b>Assessment :</b>	Examination or assignment	
<b>MSA 108A</b>	<b>Information Technology and Computer Applications</b>	<b>(15 hrs)</b>
<b>Aim :</b>	To introduce students to relevant computer systems.	
<b>Module :</b>	EDR 100 Information Technology and Computer Applications	(15 hrs)
<b>Assessment :</b>	Not assessed	

**MSA 203A Marine Environment Protection I ( 6 hrs)**  
 Aim : To enable students to implement the international and national requirements for marine environment protection on behalf of their respective administration.  
 Module : ENV 205 Contingency Planning to Combat Pollution - Human Factors ( 6 hrs)  
 Assessment : Examination or assignment

**MSA 302 Marine Environment Protection II (22.5 hrs)**  
 Aim : To enable students to implement international and national requirements for marine environment protection on behalf of their respective administrations.  
 Module : ENV 307 Oil Tanker Safety and Pollution Prevention - Regulations, Surveys and Certification Procedures (22.5 hrs)  
 Assessment : Assignments

**Marine Engineering Stream**

**MSAE102A Maritime Safety Implementation I (45 hrs)**  
 Aim : To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.  
 Modules : MS 100 Procedures/Processes for Surveys and Certification (24 hrs)  
 MS 101 Life Saving Appliances - Regulations/Surveys I ( 9 hrs)  
 MS 105 Fire Protection and Fire Appliances 1 - Regulations/ Survey/Approval, etc. (12 hrs)  
 Assessment : Examinations and assignments

**MSAE 202A Maritime Safety Implementation II (15 hrs)**  
 Aim : To enable students to implement international and national maritime safety requirements on behalf of their administrations, with emphasis on human factors.  
 Modules : MS 200 Load Line Convention and Related Matters ( 6 hrs)  
 MS 201 Structure and Roles of MSAs in Advanced Countries I ( 3 hrs)  
 MS 202 Developments in Safety Management in Companies and Ships ( 3 hrs)  
 MS 204 Port State Control I ( 3 hrs)  
 Assessment : Examinations and assignments

**MSAE 301A Maritime Safety Implementation II (150 hrs)**  
 Aim : To enable students to implement international and national requirements for on behalf of their respective administrations, with emphasis on human factors.  
 Modules : MS 303 Procedures for Surveys and Certificates ( 6 hrs)  
 MS 304 Life Saving Appliances - Survey/Approval, etc ( 9 hrs)  
 MS 306 Plan Approval Procedures by MSA and Class Societies (12 hrs)  
 MS 307 Approval of Stability Information for Ships (13.5 hrs)  
 MS 308 Maintenance of Class - In Service Inspection ( 6 hrs)  
 MS 309 Safety Management System and Emergency Drills - Human Factors (15 hrs)  
 MS 310 Tonnage Measurement (22.5 hrs)  
 MS 311 Load Line Surveys ( 4.5 hrs)  
 MS 312 Safety of Light and High Speed Craft (13.5 hrs)  
 MS 313 Log Books and Other Official Records ( 3 hrs)  
 MS 314 Maintenance of Ships and Machinery (15 hrs)  
 MS 315 Port State Control II ( 6 hrs)  
 MS 316 Structure and Roles of MSAs in Advanced Countries II ( 6 hrs)  
 MS 317 Ship Classification Societies - their Delegated Roles on behalf of Administrations ( 6 hrs)  
 MS 318 Marine Electric Machinery Construction, Operation and Safety Aspects (12 hrs)  
 Assessment : Examinations and assignments



**Nautical Stream**

**MSAN 102A Maritime Safety Implementation I (45 hrs)**

**Aim :** To enable the students to implement the international and national maritime safety requirements on behalf of their respective administrations.

<b>Modules :</b>	<b>MS 100</b>	<b>Procedures/Processes for Surveys and Certification</b>	<b>( 6 hrs)</b>
	<b>MS 101</b>	<b>Life Saving Appliances - Regulations/Surveys I</b>	<b>(12 hrs)</b>
	<b>MS 104</b>	<b>Navigation Equipment - Regulations/Inspection/Approval, etc</b>	<b>( 4.5 hrs)</b>
	<b>MS 105</b>	<b>Fire Protection and Fire Appliances I - Regulations/Survey/Approval, etc</b>	<b>(12 hrs)</b>
	<b>MS 106</b>	<b>Personnel Safety and Welfare - Crew Accommodation and related matters, including Medical Scales - Regulations/Inspection, etc</b>	<b>( 4.5 hrs)</b>
	<b>MS 107</b>	<b>Navigation, Lights, Shapes and Sound Signals (COLREG) -Regulations/ Survey/Approval, etc</b>	<b>( 6 hrs)</b>

**Assessment :** Examinations and assignments

**MSAN 202A Maritime Safety Implementation II (24 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations with emphasis on human factors.

<b>Modules :</b>	<b>MS 200</b>	<b>Load Line Convention and Related Matters</b>	<b>( 6 hrs)</b>
	<b>MS 201</b>	<b>Structure and Roles of MSA's in Advanced Countries I</b>	<b>( 3 hrs)</b>
	<b>MS 202</b>	<b>Developments in Safety Management in Companies and Ships - Human Factors</b>	<b>( 3 hrs)</b>
	<b>MS 204</b>	<b>Port State Control I</b>	<b>( 3 hrs)</b>
	<b>MS 207</b>	<b>Occupational Safety - Human Factors</b>	<b>( 3 hrs)</b>
	<b>MS 210</b>	<b>Contingency Planning for SAR - Human Factors</b>	<b>( 6 hrs)</b>

**Assessment :** Examinations and assignments

**MSAN 301A Maritime Safety Implementation III (136.5 hrs)**

**Aim :** To enable students to implement international and national maritime safety requirements on behalf of their respective administrations on human factors.

<b>Modules :</b>	<b>MS 303</b>	<b>Procedures for Surveys and Certificates</b>	<b>( 6 hrs)</b>
	<b>MS 304</b>	<b>Life Saving Appliances - Survey/Approval, etc</b>	<b>( 9 hrs)</b>
	<b>MS 305</b>	<b>Navigation Lights, Shapes and Sound Signals (COLREG) - Survey/Approval, etc</b>	<b>( 4.5 hrs)</b>
	<b>MS 307</b>	<b>Approval of Stability Information for Ships</b>	<b>(13.5 hrs)</b>
	<b>MS 309</b>	<b>Safety Management System and Emergency Drills - Human Factors</b>	<b>(15 hrs)</b>
	<b>MS 310</b>	<b>Tonnage Measurement</b>	<b>(22.5 hrs)</b>
	<b>MS 311</b>	<b>Load Line Surveys</b>	<b>( 4.5 hrs)</b>
	<b>MS 312</b>	<b>Safety of Light and High Speed Craft</b>	<b>(13.5 hrs)</b>
	<b>MS 313</b>	<b>Log Books and Other Official Records</b>	<b>( 3 hrs)</b>
	<b>MS 315</b>	<b>Port State Control II</b>	<b>( 6 hrs)</b>
	<b>MS 316</b>	<b>Structure and Roles of MSAs in Advanced Countries II</b>	<b>( 6 hrs)</b>
	<b>MS 317</b>	<b>Ship Classification Societies - their Delegated Roles on behalf of Administrations</b>	<b>( 6 hrs)</b>
	<b>MS 323</b>	<b>Navigation Equipment and Bridge Design - Inspection/Approval, etc</b>	<b>( 9 hrs)</b>
	<b>MS 324</b>	<b>Maritime Search and Rescue</b>	<b>( 9 hrs)</b>
	<b>MS 325</b>	<b>Safety Training/Manuals, Instructions and Muster Lists - Approval</b>	<b>( 9 hrs)</b>

**Assessment :** Examinations and assignments

**Total 1st Semester Class Contact Hours**

	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
<b>Marine Engineering Stream</b>	<b>277.5</b>	<b>63</b>	<b>340.5</b>
<b>Nautical Stream</b>	<b>277.5</b>	<b>58.5</b>	<b>336</b>

**SEMESTER 2**

**Common Subjects for Both Streams**

**MSA 401A Environment, Policy and Management (21 hrs)**

**Aim :** To solve problems through team-work and the use of various disciplines in a group of seminars and workshops.

<b>Modules :</b>	<b>ADM 404</b>	<b>Disaster Management Exercises - Human Factors</b>	<b>(21 hrs)</b>
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**Assessment :** Assignments

**MSA 201 Law of the Sea (21 hrs)**  
 Aim : To provide knowledge of the main provisions of the UN Convention on the Law of the Sea, 1982; its importance, impact on shipping and the direct relevance of the Convention to the role of IMO and its conventions.  
 Modules : LAW 500 Law of the Sea (21 hrs)  
 Assessment : Assignments

**MSA 303 Maritime Casualty Inquiries/Investigations (45 hrs)**  
 Aim : To provide a full understanding of roles, responsibilities and functions in the field of maritime casualties with emphasis on human factors.  
 Modules : LAW 301 Maritime Casualty Investigations - Legal Aspects (15 hrs)  
 TEC 300 Maritime Casualty Investigations - Technical Aspects (15 hrs)  
 MS 326 Processes, Procedures and Documentation for Conducting Maritime Casualty Inquiries/Investigations and Follow-up (15 hrs)  
 Assessment : Examinations and assignments

### **Marine Engineering Stream**

**MSAE 203A Ship Machinery and Automation (53 hrs)**  
 Aim : To develop understanding of the theory and applications of ship machinery and machinery automation system.  
 Modules : TEC 217 Introduction to Digital Control ( 8 hrs)  
 TEC 220 Ship Machinery (30 hrs)  
 TEC 228 Automation and Control Systems I (15 hrs)  
 Assessment : Examinations and assignments

**MSAE 402A Maritime Safety Implementation IV (22.5 hrs)**  
 Aim : To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.  
 Modules : MS 400 Structure and Roles of MSAs in Advanced Countries III ( 9 hrs)  
 MS 401 Agreement and Contracts between Maritime Administrations and Classification Societies ( 6 hrs)  
 MS 402 Noise and Vibration Problems On Board Ships ( 7.5 hrs)  
 Assessment : Not assessed

**MSAE 302 Implementation of Global and National Requirements for the Competency, Discipline and Welfare of Seafarers (36 hrs)**  
 Aim : To enable maritime safety, safety of navigation and protection of the marine environment to be ensured through the proper competence and employment of officers, key ratings etc. with emphasis on human factors.  
 Modules : MS 322 Examination and Certification of Engineering Officers (15 hrs)  
 MS 327 Manpower Planning, Manning Patterns and Identification/Monitoring of Relevant Training Schemes and Quality Assurance/Audit (15 hrs)  
 MS 328 Seafarers' Employment, Welfare, Discipline and Related Matters ( 6 hrs)  
 Assessment : Examinations and assignments

**MSAE 401 Quality Control and Quality Assurance (22.5 hrs)**  
 Aim : To examine the properties of ship material, various testing procedures, destructive and non-destructive testing, quality control, the principles of quality assurance systems and other international standards.  
 Modules : TEC 406 Materials, Testing of Materials and Non-Destructive Examination (12 hrs)  
 TEC 407 ISO and Other Standards ( 4.5 hrs)  
 TEC 408 Quality Assurance ( 6 hrs)  
 Assessment : Examinations and assignments

**Nautical Stream**

**MSAN 204A Safety of Navigation I (15 hrs)**  
 Aim : To provide foundation knowledge of matters relevant to maritime communications with emphasis on human factors.  
 Module : TEC 213 Maritime Communications (15 hrs)  
 Assessment : Not assessed

**MSAN 302A Implementation of Global and National Requirements for the Competency, Discipline and Welfare of Seafarers (42 hrs)**  
 Aim : To enable maritime safety, safety of navigation and protection of the marine environment to be ensured through the proper competence and employment of officers, key ratings etc. with emphasis on human factors.  
 Modules : MS 330 Examination and Certification of Masters and Deck Department Personnel (21 hrs)  
 MS 327 Manpower Planning, Manning Patterns and Human Factors, Identification/Monitoring of Relevant Training Schemes and Quality Assurance/Audit (15 hrs)  
 MS 328 Seafarers' Employment, Welfare, Discipline and Related Matters - Human Factors (6 hrs)  
 Assessment : Examinations and assignments

**MSAN 401A Safety of Navigation II (16.5 hrs)**  
 Aim : To provide foundation knowledge of matters relevant to safety of navigation.  
 Modules : MS 403 Pilotage and Manoeuvring of Ships (16.5 hrs)  
 Assessment : Not assessed

**MSAN 402A Maritime Safety Implementation IV (25.5 hrs)**  
 Aim : To enable students to implement international and national maritime safety requirements on behalf of their respective administrations.  
 Modules : MS 400 Structure and Roles of MSAs in Advanced Countries II (9 hrs)  
 MS 401 Agreement and Contracts between Maritime Administrations and Classification Societies (6 hrs)  
 TEC 407 ISO and other Standards (4.5 hrs)  
 TEC 408 Quality Assurance (6 hrs)  
 Assessment : Examination and assignments

**MSAN 203 Maritime Transport of Cargoes (39 hrs)**  
 Aim : To enable students to implement international and national maritime safety requirements on behalf their respective administrations with emphasis on human factors.  
 Modules : ENV 203 Maritime Transport of Dangerous Cargoes (21 hrs)  
 TEC 215 Carriage of Bulk and Special Cargoes (18 hrs)  
 Assessment : Examinations

<b>Total 2nd Semester Class Contact Hours</b>			
	<u>Common</u>	<u>Stream Specific</u>	<u>Total</u>
<b>Marine Engineering Stream</b>	<b>133.5</b>	<b>87.5</b>	<b>221</b>
<b>Nautical Stream</b>	<b>133.5</b>	<b>91.5</b>	<b>225</b>

**FIELD STUDIES**

One of the unique features of the courses offered at WMU is the specialized field studies and on-the-job training programmes undertaken by students. The purpose of these programmes is to provide meaningful applications of a student's theoretical studies.

Though the programmes vary according to the differing requirements of each course, all students are given the opportunity to visit administrations, institutions, ports and companies in a number of countries, to enable them to gain valuable insight into and experience of the professional maritime practices found in these countries.

**DISSERTATION**

During the programme, each student is required to complete a dissertation on a topic related to the course of study. Desirably the topic chosen will be related to a particular problem or matter bearing on the development of the maritime infrastructure of the student's home country.

The dissertation can involve original primary research, or an assessment or re-assessment of a topic based on secondary sources and should demonstrate evidence of the student's ability to select and review material, to analyze, evaluate and synthesize ideas and to draw relevant conclusions.

The award of the MSc degree depends upon satisfactory completion of the dissertation, to which one-fifth of the course mark is allocated.

**SUMMARY OF TOTAL CLASS CONTACT HOURS**

	<i>Marine Engineering</i>			<i>Nautical</i>		<b>Total</b>
	Common	Stream Specific	<b>Total</b>	Common	Stream Specific	
Semester 1	277.5	63	<b>340.5</b>	277.5	58.5	<b>336</b>
Semester 2	133.5	87.5	<b>221</b>	133.5	91.5	<b>225</b>
<b>TOTAL:</b>	<b>411</b>	<b>150.5</b>	<b>561.5</b>	<b>411</b>	<b>150</b>	<b>561</b>

**APPENDIX II**

SYLLABUS FOR MARITIME SAFETY SURVEYING

(NAUTICAL)

FIRST SEMESTER

COMMON SUBJECTS

MARITIME SAFETY ADMINISTRATION

Aim: To provide a general understanding of the objectives, works and function of Maritime Safety Administration.

Modules:

Maritime Safety Administration.....15 hrs.

Registration of Ships.....15 hrs.

Assessment:

Examination or Assignment

PRINCIPLES OF MANAGEMENT AND ECONOMICS

Aim: To review the fundamentals of management and economics and apply these to maritime transportation and commerce.

Modules:

Principles of Management.....15 hrs.

Maritime Economics.....15 hrs.

Assessment:

Examination or Assignment

MARITIME LAW

Aim: To provide the foundation to appreciate the complex body of maritime law derived from international conventions, codes and guidelines.

Module:

International Maritime Conventions and Codes.....15 hrs.

Assessment:

Examination or Assignment

APPLICATIONS OF MATHEMATICS AND NAVAL ARCHITECTURE I

Aim: To apply mathematical principles to ship technology with particular emphasis on learning applications.

Modules:

Applied Mathematics.....15 hrs.  
Naval Architecture.....30 hrs.

Assessment:

Examination or Assignment

SPECIALIZED SUBJECTS

MARITIME SAFETY IMPLEMENTATION I

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration.

Modules:

Procedures/Processes for Surveys  
and Certification..... 9 hrs.  
Life Saving Appliances-Regulations/  
Surveys I.....15 hrs.  
Navigation Equipment-Regulations/  
Inspection/Approval.....15 hrs.  
Fire Protection and Fire Appliances-Regulation/  
Surveys/Approval.....15 hrs.  
Personnel Safety and Welfare-Crew accommodations,  
Medical Scales and related matters- Regulations  
and Inspection..... 6 hrs.

Assessment:

Examination or Assignment

MARITIME SAFETY IMPLEMENTATION II

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration.

Modules:

Navigation, Lights, Shapes and Sound Signals-  
Regulations, Surveys and Approval.....15 hrs.  
Load Lines Convention..... 9 hrs.  
Structure and Roles of MSA I.....15 hrs.  
Port State Control I..... 6 hrs.

MARITIME TRANSPORT OF CARGOES I

Aim: To enable the students to implement the international and national maritime safety requirements regarding the transport of dangerous cargoes.

Module:

Carriage of Bulk and Special Cargoes.....30 hrs.

Assessment:

Examination or Assignment

ELECTIVES

Modules:

Maritime Communication.....15 hrs.  
Maritime Security.....15 hrs.  
Quality Assurance/ISO and other Standards...15 hrs.

Assessment:

Examination or Assignment

SECOND SEMESTER

COMMON SUBJECTS

LAW OF THE SEA

Aim: To provide the foundation of the proper utilization of the sea.

Modules:

Law of the Sea.....15 hrs.

Assessment:

Examination or Assignment



MARINE ENVIRONMENT PROTECTION

Aim: To enable the student to implement the international and national requirements for marine environment protection on behalf of the administration.

Modules:

- Regulations, Procedures/Processes for Surveys and Certification.....15 hrs.
- Oil Tanker Safety and Pollution Prevention- Regulations, Surveys and Certifications Procedures.....30 hrs.

NAVAL ARCHITECTURE II

Aim: To provide knowledge of stability and structural strength of ships in the context of maritime safety.

Modules:

- Stability of Ships.....24 hrs.
- Structural Strength of Ships.....21 hrs.

Assessment:

Examination or Assignment

SPECIALIZED SUBJECTS

MARITIME SAFETY IMPLEMENTATION III

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration with emphasis on human factors.

Modules:

- Procedures for Surveys and Certificates..... 9 hrs.
- Life Saving Appliances-Surveys and Approval.....15 hrs.
- Navigation, Lights, Shapes and Sound Signals- Regulation, Surveys and Approval.....15 hrs.
- Approval of Stability Information for Ship.....15 hrs.

Safety of Fishing Vessels..... 6 hrs.

Assessment:

Examination or Assignment

#### MARITIME SAFETY IMPLEMENTATION IV

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration with emphasis on human factors.

Modules:

Tonnage Measurement.....15 hrs.

Load Lines Surveys..... 6 hrs.

Port State Control II..... 9 hrs.

Structures and Roles of MSA II.....15 hrs.

Assessment:

Examination or Assignment

#### MARITIME TRANSPORT OF CARGOES II

Aim: To enable the students to implement the international and national maritime safety requirements regarding the transport of dangerous cargoes.

Modules:

Maritime Transport of Dangerous Cargoes.....30 hrs.

Assessment:

Examination or Assignment

#### ELECTIVES

Modules:

Maritime Communication.....15 hrs.

Maritime Security.....15 hrs.

Quality Assurance/ISO and other Standards...15 hrs.

Assessment:

Examination or Assignment

SYLLABUS FOR MARITIME SAFETY SURVEYING

(ENGINEERING)

FIRST SEMESTER

COMMON SUBJECTS

MARITIME SAFETY ADMINISTRATION

Aim: To provide a general understanding of the objectives, works and function of Maritime Safety Administration.

Modules:

Maritime Safety Administration.....15 hrs.

Registration of Ships.....15 hrs.

Assessment:

Examination or Assignment

PRINCIPLES OF MANAGEMENT AND ECONOMICS

Aim: To review the fundamentals of management and economics and apply these to maritime transportation and commerce.

Modules:

Principles of Management.....15 hrs.

Maritime Economics.....15 hrs.

Assessment:

Examination or Assignment

MARITIME LAW

Aim: To provide the foundation to appreciate the complex body of maritime law derived from international conventions, codes and guide-lines.

Module:

International Maritime Conventions  
and Codes.....15 hrs.

Assessment:

Examination or Assignment

**APPLICATIONS OF MATHEMATICS AND NAVAL ARCHITECTURE I**

**Aim:** To apply mathematical principles to ship technology with particular emphasis on learning applications.

**Modules:**

- Applied Mathematics.....15 hrs.
- Naval Architecture.....30 hrs.

**Assessment:**

Examination or Assignment

**SPECIALIZED SUBJECTS**

**MARITIME SAFETY IMPLEMENTATION I**

**Aim:** To enable the students to implement the international and national maritime safety requirements on behalf of the administration.

**Modules:**

- Procedures/Processes for Surveys and Certification.....15 hrs.
- Life Saving Appliances- Regulations/Surveys I.....15 hrs.
- Personal Safety, Delegated Statutory Surveys and Procedures of Hull, Machinery and Load Lines.....15 hrs.
- Fire Protection and Fire Appliances-Regulations/Surveys/Approval.....15 hrs.

**Assessment:**

Examination or Assignment

**MARITIME SAFETY IMPLEMENTATION II**

**Aim:** To enable the students to implement the international and national maritime safety requirements on behalf of the administration.

Modules:

- Load Lines Convention.....15 hrs.
- Structure and Roles of MSA I.....15 hrs.
- Port State Control I.....15 hrs.

Assessment:

Examination or Assignment

SHIP AUTOMATION

Aim: To develop understanding of the theory and application of ship machinery automation system.

Modules:

- Introduction to Digital Control.....15 hrs.
- Automation and Control System I.....15 hrs.

Assessment:

Examination or Assignment

ELECTIVES

Modules:

- Maintenance of Ship Machinery.....15 hrs.
- Marine Electric Machinery Construction,  
Operation and Safety Aspects.....15 hrs.
- Quality Assurance / ISO and  
other Standards.....15 hrs.

Assessment:

Examination or Assignment

SECOND SEMESTER

COMMON SUBJECTS

LAW OF THE SEA

Aim: To provide the foundation of the proper utilization of the sea.

Module:

- Law of the Sea.....15 hrs.

MARINE ENVIRONMENT PROTECTION

Aim: To enable the student to implement the international and national requirements for marine environment protection on behalf of the administration.

Modules:

- Regulations, Procedures/Processes for Surveys and Certification.....15 hrs.
- Oil Tanker Safety and Pollution Prevention- Regulations, Surveys and Certifications Procedures.....30 hrs.

NAVAL ARCHITECTURE II

Aim: To provide knowledge of stability and structural strength of ships in the context of maritime safety.

Modules:

- Stability of Ships.....24 hrs.
- Structural Strength of Ships.....21 hrs.

SPECIALIZED SUBJECTS

MARITIME SAFETY IMPLEMENTATION III

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration with emphasis on human factors.

Modules:

- Procedures for Surveys and Certificates.....15 hrs.
- Life Saving Appliances-Surveys and Approval.....15 hrs.
- Plan Approval Procedures by MSA and Class Societies.....15 hrs.
- Approval of Stability information for ships.....15 hrs.

Assessment:

Examination or Assignment

MARITIME SAFETY IMPLEMENTATION IV

Aim: To enable the students to implement the international and national maritime safety requirements on behalf of the administration.

Modules:

Tonnage Measurement.....15 hrs.  
Load Lines Surveys..... 9 hrs.  
Port State Control II..... 6 hrs.  
Structures and Roles of MSA.....15 hrs.

Assessment:

Examination or Assignment

SHIP MACHINERY

Aim: To develop understanding of the theory and application of ship machinery automation system.

Module:

Ship Machinery.....30 hrs.

Assessment:

Examination or Assignment

ELECTIVES

Modules:

Maintenance of Ship Machinery.....15 hrs.  
Marine Electric Machinery Construction,  
Operation and Safety Aspects.....15 hrs.  
Quality Assurance / ISO and  
other Standards.....15 hrs.

Assessment:

Examination or Assignment

**APPENDIX III**



SYLLABUS FOR MASTER OF SCIENCE IN MARITIME

SAFETY ADMINISTRATION

FIRST SEMESTER (YEAR TWO)

COMMON SUBJECTS

MANAGEMENT II

Aim: To provide understanding of the management functions with emphasis to its operational aspects.

Module:

Management . . . . . 30 hrs.

Assessment:

Examination or Assignment

HUMAN RESOURCE MANAGEMENT

Aim: To provide understanding of the behavioural psychology and sociology in managing human resources.

Modules:

Human Resource Management . . . . . 15 hrs.

Organizational Behaviour . . . . . 15 hrs.

Industrial Relations and Associated Issues . 15 hrs.

Assessment:

Examination or Assignment

MANAGEMENT OF MARINE TECHNOLOGY

Aim: To further understand the management of marine technology, analyzing classification and survey requirements, safety systems, procedures and control.

Modules:

Marine Technology and Marine Environment

Management . . . . . 15 hrs.

Safety Systems, Procedures and Control . . . 15 hrs.

Classification and Survey. . . . . 15 hrs.

Assessment:

Examination or Assignment

#### MARITIME ADMINISTRATION

Aim: To provide a general understanding of the functions of national maritime administration.

Module:

Maritime Administration. . . . . 15 hrs.

Assessment:

Examination or Assignment

#### MANAGERIAL STATISTICS

Aim: To provide the students an understanding of the application of statistics in the field of management.

Module:

Statistics . . . . . 30 hrs.

Assessment:

Examination or Assignment

#### RESEARCH METHODOLOGY

Aim: To prepare the students in the conduct of research by providing knowledge and skills to enable them to carry out research works.

Module:

Research Methodology . . . . . 30 hrs.

Assessment:

Examination or Assignment

**SPECIALIZED SUBJECTS**

**MARITIME CASUALTY INQUIRIES AND INVESTIGATIONS**

Aim: To provide a full understanding of roles, responsibilities and functions in the field of maritime casualties.

Modules:

- Maritime Casualty Investigations (Legal) . . 15 hrs.
- Maritime Casualty Investigation (Technical) .15 hrs.
- Processes, Procedures and Documentation. . . 15 hrs.

Assessment:

Examination or Assignment

**IMPLEMENTATION OF GLOBAL AND NATIONAL REQUIREMENTS FOR THE COMPETENCY, DISCIPLINE AND WELFARE OF SEAFARERS.**

Aim: To enable maritime safety, safety of navigation and protection of marine environment to be ensured through the proper competence and employment of seafarers.

Modules:

- STCW and National Examination System . . . . 15 hrs.
- Manpower Planning, Manning Patterns,  
Monitoring of Training Scheme  
and Quality Assurance and Audit . . . . 15 hrs.
- Seafarers Employment, Welfare and Discipline.15 hrs.

Assessment:

Examination or Assignment

**MARITIME LAW AND POLICY**

Aim: To enable the students to understand the complexities of maritime law complemented by maritime customs and practice.

Module:

Maritime Law and Policy. . . . . 15 hrs.

Assessment:

Examination or Assignment

**PLANNING AND RESPONSE TO MARITIME DISASTER**

Aim: To enable the students to plan, organized and coordinate in case of maritime disaster.

Modules:

Control and Combat of Marine Pollution . . . 15 hrs.

Search and Rescue . . . . . 15 hrs.

Assessment:

Examination or Assignment

**ELECTIVES**

Modules:

International Environmental Issues. . . . .15 hrs.

Ship Maneuvering and Pilotage . . . . .15 hrs.

Ship Structure. . . . .15 hrs.

Assessment:

Examination or Assignment

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