NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF MECHANICAL ENGINEERING
NAVAL ENGINEERING PROGRAM

MV315 – MARINE MACHINES I

I. GENERAL INFORMATION

CODE	: MV315 Marine Machines I
SEMESTER	: 8
CREDITS	: 4
HOURS PER WEEK	: 5 (Theory – Practice)
PRE-REQUISITES	: MC323-MV335
CONDITION	: Compulsory

II. COURSE SUMMARY

The course belongs to the student's professional training in the application of the concepts, methods and techniques of Engineering Plants of civil and military vessels and impart the theoretical and practical knowledge of the naval propulsion plants with marine diesel engines as well as the sizing and installations of the various systems that form the engineering plant of a ship. Engine assembly, Transmission assembly and propeller assembly. Requirement of classification societies.

At the end of the course the student must have the necessary knowledge for the design and selection of all the systems used in the naval propulsion plants of all types of ships. Problems or situations of application in engineering are developed and use of specialized software will be made.

III. COMPETENCES

The student:

1. Analyzes the operation of the type of engineering plant of the ship, It organizes data for its proper analysis and interpretation and calculates and interprets the different types of power and performance of the plant for a particular type of ship, fundamentally bearing in mind the resistance to the advance of the power calculation hull.
2. Explains and determines the engineering plant and its well-defined components, according to the use of classification societies such as ABS, GL, BV, LLR, NKK, RINA.
3. Understands and applies technical concepts for the operation of the naval, main and auxiliary engineering plant.
4. It interprets the concept of space distribution in the engine room and executes or elaborates plans of arrangement or general arrangement of machines, equipment and systems.

5. Designs and explains the operational considerations of an engineering plant: speed, autonomy of special vessels.

IV. LEARNING UNITS

1.- Naval propulsive plants: 15 hours

Role of the naval engineer in the calculations of propulsion. Responsibility of the naval engineer. Current trends in the propulsion of ships, characteristics and facilities of the ship. Auxiliary facilities, classifications.

Room or machine room: Dimensioning and construction plans. With marine engine plants. Requirements of classification societies.

2. -Engineering plant systems, calculations and components: 10 hours

Systems: Ship piping systems. General requirements, application for ships of type A and B according to international conventions and classification societies.
Fuel system of the propulsion plant: sizing, CTP, Types of tanks, filling system, transfer, aeration, overflow and soundings. Graphics and construction plans.
Requirements of classification societies.

3.- Lubrication system of the propulsive plant: 10 hours
Lubrication of the main engine, auxiliary motors, reducer, miscellaneous services, constructive plans. Requirements of classification societies.
Compressed air system: Sizing, air bottle.
Air compressors, other compressed air services, construction drawings.
Requirements of classification societies.

4.- Ventilation system of the camera or engine room: 10 hours
Calculations and construction drawings, ventilation air, direction and temperatures.
Design features, combustion air, exhaust systems, classes.
Requirements of classification societies.

5, - Unloading systems, calculations and construction plans: 15 hours
Unloading systems, bilge service, engine room unloading service, unloading service in other compartments, main manifold, suction branch of the warehouse machine chamber. Requirements of classification societies.
Cooling systems of the propulsion plant: closed cooling systems and planes of the fresh water circuit, salt water circuit.
Requirements of classification societies.
Electrical systems of the ship: Sizing and general requirements of the system, protection, generators, batteries, electric balance.
Requirements of classification societies.

6.- Shaft line system. 10 hours
Dimensioning and constructional planes of thrust, intermediate and tail axes.
Joints between axles, accessories and materials.
Requirements of classification societies.

General arrangement of machines: Dimensioning and construction plans, rudder assembly, propellers, shafts, gearbox and motor, accessories and materials.

V. METHODOLOGY

The course is developed in sessions of theory, practice. In the theory sessions, the teacher presents the concepts, and applications. Theoretical for calculations of yields and potencies In the practical sessions, will make 2 technical visits to SIMA CALLAO solve various problems and analyze their solution. The student must present and present an integrative project or project. In all the sessions the active participation of the student is promoted.

VI. EVALUATION FORMULA

Evaluation System "F". Calculation of Final Average: PF = (2 FE + 1 ME + 1 Q) / 4
FE: Final exam, ME: Mid-Term exam, Q: Quizzes

VII. BIBLIOGRAPHY

1. Notes of the Professional School of Naval Engineering of the Politecnica de Madrid.
2. Marine Engineering, ROY L. HARRINGTON Editor.