# MARITIME-ENGINE (MNG)

**MNG 100 - Intro to Vessel Operations**
**Credit Hours: 1**, **Contact Hours: 1**
Division: Maritime
This course is a general introduction to vessel operations. Topics covered include; the duties and responsibilities of vessel personnel, an introduction to the engine propulsion systems, the use of tools and auxiliary machinery, personal safety procedures, marine pollution prevention, and governmental regulations. This course provides a foundation for the deck and engineering cadet to build upon in his/her GLMA program of study. STCW
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 104 - Engine Systems Graphics**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
The course will acquaint the student to the proper use of measuring systems and drafting equipment. The course will introduce the techniques used in the production of multi-view projection, orthographic representation, auxiliary views, section views, and dimensioning. The student will be familiar with the correct (ANSI) symbols used in piping, electrical, and fluid power schematics. The student will be exposed in the use of CAD to produce the listed topics. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 110

**MNG 105 - Shipboard Information Systems**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
This course will introduce the student to the PC and its use as typically found aboard a Merchant Vessel. Basic computer setup, maintenance, and system troubleshooting are covered. Operating systems, communications programs, databases, word processors, spreadsheets, internet research, and CBT programs are discussed and demonstrated. The future of computers in the marine industry is explored. Special emphasis is given to group communications, group dynamics and problem solving and recognition, by developing process.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 110 - Engineering Mechanics**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
Survey of the construction, operation, and maintenance of shipboard systems. The major emphasis will be on piping, valves, control valves, and pumps. Practical application of the above items will be supported in the lab portion of this course with computer simulation exercises. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 104

**MNG 234 - Electronic Fundamentals**
**Credit Hours: 4**, **Contact Hours: 4**
Division: Maritime
This course bridges the gap between theoretical physics and practical hands on technology. Industrial electrical safety, shock hazards and emergency procedures are stressed. The cadet receives practical hands on experience with both analog and digital meters. Digital and analog circuits are created both in the lab and as computer simulations. Practical considerations of circuit construction in the field are discussed in terms of ABS, USCG, and IEEE regulations and requirements.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 250 - Fluid Systems**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
This course will introduce the cadet to the shipboard hydraulic and pneumatic systems. The cadet will be introduced to the principles of fluid power: theory, components construction, operation, installation and maintenance, with an overview of these systems on a ship. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 260 - Maritime Machining**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
This is a basic course that when completed a student will know the fundamentals and be able to operate common machine tool equipment like an engine lathe, band saw and vertical milling machine. Also covered will be measuring and inspection tools, drill press and surface plate. Quantitative Reasoning.
Required Prerequisite(s): Completion of first academic year. All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 270 - Issues in Power Production**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
This course will delve into current issues in the field of power production, including such areas as local, state, and federal requirements and interfaces. Renewable energy such as solar, wind, and biomass will be considered. The future of energy and how it affects society will be explored. The student will develop an understanding of issues currently facing the power production issue. Group 2 course.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 271 - Maritime Welding**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
A welding theory and practice course. Manipulative skills are emphasized for the Gas Metal Arc and Shielded Metal Arc Welding processes. Plasma Arc and Oxy-Fuel Cutting are also introduced. Appropriate reading assignments are included. Critical Thinking - Direct.
Required Prerequisite(s): Completion of first academic year. All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Recommended Prerequisite(s): ENG 111 and MTH 111

Corequisites: MNG 271L

**MNG 271L - Maritime Welding Lab**
**Credit Hours: 0**, **Contact Hours: 0**
Division: Maritime
See MNG 271 for course description. Critical Thinking - Direct.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Recommended Prerequisite(s): ENG 111 and MTH 111

Corequisites: MNG 271

**MNG 275 - Refrigeration**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
This course provides instruction in the operation and maintenance of refrigeration and air conditioning equipment used on merchant vessels. It covers the theory of refrigeration and the practical operation of refrigeration plants. The student is introduced to the Environmental Protection Agency (EPA) rules governing halogenated refrigerants (CFCs). A discussion of the proper procedures to recover, recycle, and reclaim (CFCs) is also discussed. Lecture is reinforced with the use of hands-on labs. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 290 - Power Systems Internship**
**Credit Hours: 5-6**, **Contact Hours: 5-6**
Division: Maritime
During this course, the student will be working in a commercial facility following a prescribed course in the study of plant operations with particular emphasis on the machinery room and auxiliary equipment, including safety requirements. In addition, the student spends a minimum of eight hours a day gaining experience in the various engineering duties and responsibilities. Group 2 course.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 314 - Diesel Engineering**
**Credit Hours: 7**, **Contact Hours: 7**
Division: Maritime
A comprehensive course dealing with the development of the diesel engine as it applies to marine propulsion. This course is designed to cover the construction, operation, and maintenance of the marine diesel engine and its support systems. Lecture is reinforced with extensive use of hands-on labs and computerized simulations. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 317 - Engineering Sea Project I**
**Credit Hours: 3**, **Contact Hours: 3**
Division: Maritime
During this course the cadet is on board the TS State of Michigan. The cadet follows a prescribed course of study in vessel operations with particular emphasis on engine room and auxiliary equipment, including safety requirements. In addition, the cadet spends eight hours a day under the supervision of a licensed officer gaining experience in various engineering duties and responsibilities. STCW. Critical Thinking - Direct.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 318 - Engineering Sea Project II**
**Credit Hours: 6**, **Contact Hours: 6**
Division: Maritime
This course is a continuation of MNG 317 and is designed to provide the cadet with advanced knowledge and sailing time to meet the licensing requirements of the U.S. Coast Guard, STCW and the criteria established by the Maritime Administration. STCW. Critical Thinking - Direct.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 319 - Engineering Sea Project III**
**Credit Hours: 6**, **Contact Hours: 6**
Division: Maritime
This course is a continuation of MNG 318 and is designed to further enhance the cadet's professional knowledge and sailing time to meet the licensing requirements of the U.S. Coast Guard, STCW and the criteria established by the Maritime Administration. STCW. Critical Thinking - Direct.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 321 - Marine Boilers**
**Credit Hours: 3.5**, **Contact Hours: 3.5**
Division: Maritime
This course is an intensive study of Marine Boilers and covers all types of Water Tube boilers. Emphasis is placed on construction, operation and maintenance of equipment. Sub systems such as fuel handling and combustion chemistry, air handling; water preparation and chemistry, automated combustion systems and water regulation systems are covered in detail. Special emphasis is placed on USCG regulations and STCW competencies. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 322 - Marine Turbines**
**Credit Hours: 2.5**, **Contact Hours: 2.5**
Division: Maritime
This course is an in-depth study of marine turbine propulsion plants. It covers theory, construction, operation, maintenance and inspection procedures typically associated with marine use. Associated systems such as lubrication, exhaust and condensate systems are also covered. Drive trains, reduction gear, stern tubes shafting and propellers are also discussed. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 323 - Marine Steam Lab**
**Credit Hours: 1**, **Contact Hours: 1**
Division: Maritime
This is a hands-on course intended to reinforce MNG 321 and MNG 322. Students will disassemble, inspect, and reassemble machinery typical of what is found aboard ship. Machinery condition will be noted and recommendations made. Machinery records will be updated. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

**MNG 335 - Electric Machines and Controls**
**Credit Hours: 4**, **Contact Hours: 4**
Division: Maritime
This course covers the theory, application, operation, and maintenance of rotating machines as typically found aboard U.S. Merchant Ships and related industrial applications. Generators (DC and AC), motors (DC, multiple and single phase AC), transformers, and related equipment are covered. Special attention is given to magnetic relay and electronic logic control circuits. Regulations specific to CFR title 46 and IEEE are reviewed. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 336

**MNG 336 - Electric Mach. & Controls Lab**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
This course is a companion class to MNG 335. Course material is reinforced with practical hands-on experience with universal electrical lab machinery. The operating characteristics of typical rotating machines are studied. Special attention is given to problems associated with multiple generator AC distribution. Safe and effective troubleshooting techniques are practiced on live 110/208 volt electrical control systems. STCW.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 335

**MNG 455 - Engine Room Resource Mgmt.**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
This course uses the Engineering Simulators to strengthen the watch standing skills of the engineering cadet. The cadet will be required to operate shipboard systems, manage engine room personnel, and become familiar with preparing reports required in the operation of a modern engine room.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 466, MNG 496

**MNG 466 - Engine Room Business**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
This course is intended to acquaint the Cadet to the every day management and administrative activities confronting the Marine Engineer. The Cadet will be introduced to management and personnel skills necessary to deal with people problems peculiar to the marine environment. General issues of alcohol, drug abuse, and sexual harassment in the marine environment will be discussed, and placed in perspective with USCG and STCW protocols.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 455, MNG 496

**MNG 496 - License Preparation - Engine**
**Credit Hours: 2**, **Contact Hours: 2**
Division: Maritime
A complete review of all professional subjects studied in the Maritime Engineering program. This course is designed to cover the essentials of the Third Assistant Engineer's examination administered by the U.S. Coast Guard. The final grade for this course is dependent on taking the U.S. Coast Guard license exam.
Required Prerequisite(s): All prerequisites for all GLMA courses are satisfied by following the approved Course Sequence Guide and any deviation from this guide needs to be approved by the cadet's adviser.

Corequisites: MNG 455, MNG 466