

# MARINE ENGINEERING MANAGEMENT

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## Program Outline

|                    |                                      |
|--------------------|--------------------------------------|
| <b>Major:</b>      | MEMG                                 |
| <b>Length:</b>     | 1 Year                               |
| <b>Delivery:</b>   | 2 Semesters                          |
| <b>Credential:</b> | Ontario College Graduate Certificate |
| <b>Effective:</b>  | 2017-2018                            |
| <b>Location:</b>   | Owen Sound                           |
| <b>Start:</b>      | Winter (Owen Sound)                  |

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### Description

Students are presented with material designed in co-operation with Transport Canada Marine Safety and Security (TCMSS), and Canada's shipping companies. Content material includes the academic portion of the TCMSS Engineering Officer Education Training (EOET) program for senior engineering officers. Students develop the knowledge, skills, and professionalism expected to function as part of an engineering team at the management level.

NOTE: This is a Transport Canada designated program.

### Career Opportunities

The graduate of this program may find a rewarding career as a ship's engineering officer managing commercial vessel operations throughout Canada and the world. This program may lead to career advancement to senior ranks on board ships and to positions of leadership in the marine industry.

### Program Learning Outcomes

The graduate has reliably demonstrated the ability to:

- use principles of leadership, team management and conflict resolution expectant of a marine engineering officer at the management levels;

- lead and manage effective operational teams whose goal is to transport cargo in a safe and environmentally sustainable manner;
- perform all work in accordance with legislation, regulation, policies and practices related to health and safety, accessibility, human rights and environmental management;
- evaluate the power plant performance and efficiencies through charting and trending and participate in the installation and maintenance of marine equipment and systems;
- operate and maintain equipment safely using handbooks, catalogues, manufacture's specifications, checklists, and legislative codes;
- interpret installation drawings, assembly drawings and detail drawings and compile technical specifications;
- integrate electro-technology, electronics and electrical equipment in the operation of alternators, generators, AC and DC motors;
- use senior engineering management principles during normal and abnormal operations of marine vessels;
- apply computer skills to conduct daily power plant operations at the management level;
- analyze basic entrepreneurial strategies used to identify and respond to new opportunities.

### **The Program Progression:**

Winter Intake – Owen Sound

Semester 1 | Semester 2

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 Winter | Summer  
 2018 | 2018

### **Admission Requirements:**

Applicants must meet ONE of the following requirements to be eligible for admission to this program:

- Graduates of a Marine Engineering Cadet Training Program in Canada, (Georgian METC graduates meet this requirement), or
- holders of a Certificate of Competency as a Marine Engineer issued under the STCW Convention, or
- equivalent level of knowledge demonstrated through an interview and portfolio of experience

Note: applicants seeking transfer credit or advanced standing from other programs may be considered on an individual basis

**Additional Information:**

This program delivers the academic portion of the TCMSS Engineering Officer Education Training (EOET) Program for senior engineering officers. Further courses in engineering knowledge subjects and simulator training are also available at Georgian College.

Students interested in obtaining TCMSS engineering certificates must comply with legal requirements. These may include proof of Canadian Citizenship or proof of permanent resident status and a valid medical certificate and marine emergency training. Refer to Canada Shipping Act Marine Personnel Regulations for details.

**Graduation Requirements:**

10 Mandatory Courses

**Graduation Eligibility:**

To graduate from this program, a student must attain a minimum of 60% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester. The passing weighted average for promotion through each semester and to graduate is 60%.

**Mandatory Courses**

|          |                                    |
|----------|------------------------------------|
| MEMG1000 | Advanced Thermodynamics            |
| MEMG1001 | Advanced Applied Mechanics         |
| MEMG1003 | Automation and Control Systems 1   |
| MEMG1004 | Automation and Controls 2          |
| MEMG1005 | Ship's Business and Maritime Law   |
| MEMG1006 | Naval Architecture                 |
| MEMG1007 | Electrical Machines Management     |
| MEMG1010 | Power Plant Auxiliaries Management |
| MEMG1011 | Steam Plant Management             |
| MEMG1012 | Motor Plant Management             |

**Course Descriptions:**

**MEMG1000 Advanced Thermodynamics 80.0 Hours**

This management level course presents the thermodynamic analysis of heat engines, heat transfer and refrigeration systems. The course is based on the fundamental thermodynamic concepts and analysis techniques needed for advanced analysis of energy flow for safe and efficient operation of a modern marine power plant.

**MEMG1001 Advanced Applied Mechanics 64.0 Hours**

This management level course is designed to broaden the student's knowledge of general mechanics, fluid mechanics, balancing, vibration, stress and strain, torsion, as they relate to shipboard systems and structures.

**MEMG1003 Automation and Control Systems 1 80.0 Hours**

This course presents material relating to electrical, electronic and control engineering at a senior engineering level. The course deals with system configuration of automatic control systems, and reviews the fundamentals of process control, AC motor control and hydraulic and pneumatic control circuits.

**MEMG1004 Automation and Controls 2 64.0 Hours**

Practical application of automation and controls for safe operation of shipboard automated processes is the focus of this course. Material includes automated controls and system configuration of automated control equipment for boilers, main propulsion, and power distribution. Troubleshooting of electrical and electronic equipment, testing, and calibration and programmable logic controller basics are discussed.

**MEMG1005 Ship's Business and Maritime Law 48.0 Hours**

Management and control of compliance with legislative requirements, measures to ensure safety of life at sea and protection of the marine environment are the focus of this course. General subjects for study include, United Nations Conventions on the Law of Sea, International Maritime Organization and its conventions, International Labour Organization, World Health Organization and the Canada Shipping Act and its regulations.

**MEMG1006 Naval Architecture 128.0 Hours**

Naval architecture and ship construction, including damage control at a management level, are presented in this course, with a strong emphasis on theoretical and practical knowledge related to proper decision making in the event that the ship's hull is compromised. Relationship between speed and power/fueling requirements of the ship's hull is discussed as well.

**MEMG1007 Electrical Machines Management 144.0 Hours**

Electrical, electronic and control engineering at a senior engineering level are presented in this course. Topics include electronics, power electronics, electrical theory, AC machines, and their practical application on board a vessel. There is discussion of high

voltage installations, distributions and control. Troubleshooting of electrical equipment is stressed during the course.

**MEMG1010 Power Plant Auxiliaries Management 144.0 Hours**

Safe working practices and maintenance management concepts for auxiliaries are taught in this course. Material includes efficient operation, surveillance, performance, assessment and maintaining safety of auxiliaries in a power plant, detection and identification of machinery faults and inspection and adjustment of equipment as per class and statutory requirements.

**MEMG1011 Steam Plant Management 96.0 Hours**

Safe working practices and steam plant management concepts are taught in this course. Material includes efficient operation, surveillance, performance, assessment and maintaining safety of power plant, detection and identification of machinery faults and inspection and adjustment of equipment as per class and statutory requirements.

**MEMG1012 Motor Plant Management 128.0 Hours**

Safe working practices and motor plant management concepts are presented in this course. Material includes efficient operation and performance assessment; detection and identification of machinery faults; inspection and adjustment of equipment as per Class and statutory requirements. Management of safe working practices with respect to the Canada Shipping act's Marine Occupational Health and Safety and the Canada labour Code requirements are also considered.

**Course Description Legend**

P = Prerequisite; C = Concurrent prerequisite; CO= Corequisite

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