MARINE ENGINEERING TECHNOLOGY

Program: MTCY
Credential: Ontario College Advanced Diploma, Co-op
Delivery: Full-time
Work Integrated Learning: 2 Co-op Work Terms
Length: 6 Semesters, plus 2 work terms
Duration: 3 Years
Effective: Fall 2019
Location: Owen Sound

Description
This program is an internationally recognized co-operative marine engineering cadet program designed in co-operation with Transport Canada Marine Safety and Security (TCMSS) and Canada's shipping companies. Students focus on developing competencies required to function as part of a shipboard marine engineering team. Content includes, and is based upon, the TCMSS Engineering Officer Education Training (EOET) program requirements.

The final two semesters are open to anyone holding an STCW Reg. III/1 Marine Engineer Certificate of Competency. These students can apply for advanced standing exempting them from the first two years of the program. Upon completion of semesters five and six, they may be exempted from written examinations for 2nd and Chief Engineer Officer.

NOTE: This is a TCMSS approved program.

Career Opportunities
Graduates are educated and trained to become marine engineer officers of the watch. They may find a rewarding career as a ship's engineering officer on board commercial vessels such as bulk carriers, tugs, ferries, tankers, cruise ships, coast guard and fishing vessels throughout Canada and the world. This program may also lead to positions of leadership in the marine industry. Graduates may earn academic exemptions and credentials to advance to Chief Engineer pending further shipboard experience and higher level short training courses.

Program Learning Outcomes
The graduate has reliably demonstrated the ability to:

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

Practical Experience
Co-operative Education is a mandatory component of all Co-op programs at Georgian College; it has been designed as a process by which students integrate their academic education with work experience related to their programs of study. This integration affects much more than simply earning a salary, including the adjustment to the work environment and the development of professionalism. It also reinforces skills and theory learned during academic semesters, develops professional contacts, job knowledge and career path, improves human relations and communication skills, and promotes personal maturity and financial independence.

Students are requested to register, attend and participate in their scheduled co-operative education classes. These classes are scheduled for all first year students and are expected to be completed in order for students to proceed successfully to their first co-op work experiences.

To ensure students are eligible to proceed onto any co-op work experience, students should refer to Promotional Status and Eligibility for Co-op as outlined in the College Calendar. Co-op policies and procedures can be located on our website: www.georgiancollege.ca/student-services/co-op-and-career-services/students-tab/ (http://www.georgiancollege.ca/student-services/co-op-and-career-services/students-tab/)

Georgian College follows the Co-operative Education guidelines set out by the Canadian Association for Co-operative Education (CAFCE) and Education at Work Ontario (EWO) by supporting the learning outcomes designed for the program specific graduate profile and curriculum as set out by the Ministry of Advanced Education and Skills Development.

External Recognition
This program is accredited by the Canadian Association for Co-operative Education.

The Program Progression
Fall Intake
- **Sem 1:** Fall 2019
- **Sem 2:** Winter 2020
- **Sem 3:** Fall 2020
- **Sem 4:** Winter 2021
- **Work Term 1:** Summer 2021
- **Work Term 2:** Fall 2021
- **Sem 5:** Winter 2022
- **Sem 6:** Summer 2022
Articulation
A number of articulation agreements have been negotiated with universities and other institutions across Canada, North America and internationally. These agreements are assessed, revised and updated on a regular basis. Please contact the program co-ordinator for specific details if you are interested in pursuing such an option. Additional information can be found on our website at http://www.georgiancollege.ca/admissions/credit-transfer/

Admission Requirements
OSSD or equivalent with
- Grade 12 English (C or U)
- Grade 12 Mathematics (C or U)

Applicants must provide a valid Transport Canada Marine Medical stating "fit for sea service" or "fit for sea service with limitations". In the case of an applicant with a certificate "fit for sea service with limitations", the application will be reviewed for admission.

For advanced standing entry into the 3rd year (Semester 5 and 6) of the program, the following additional requirements apply:

- 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

Mature students, non-secondary school applicants (19 years or older), and home school applicants may also be considered for admission. Eligibility may be met by applicants who have taken equivalent courses, upgrading, completed their GED, and equivalency testing. For complete details refer to: www.georgiancollege.ca/admissions/policies-procedures/ (http://www.georgiancollege.ca/admissions/policies-procedures/)

Applicants who have taken courses from a recognized and accredited post-secondary institution and/or have relevant life/learning experience may also be considered for admission; refer to the Credit Transfer Centre website for details: www.georgiancollege.ca/admissions/credit-transfer/ (http://www.georgiancollege.ca/admissions/credit-transfer/)

Additional Information
This is a fully integrated co-operative education program, wherein the cadet will participate in semesters of academic study at the Owen Sound Campus, interspersed with work term placements onboard ships. Hence, undergraduates are involved in work activities directly related to their educational objectives.

Every effort is made to arrange work term placements, however, cadets must qualify for such and no guarantee of placement can be made.

Canadian flagged ships only accept Canadian Citizens or Permanent Residents for employment. International students are encouraged to investigate Co-op opportunities prior to commencing studies. Cadets may be subjected to adverse environmental conditions while on board ship (noise, dirt, dust, confined quarters and heavy lifting). Anyone with known allergies should consult with the Co-op department.

International applicants must sign a letter to acknowledge that Transport Canada does not issue Marine Certificates of Competency (Marine Licence) to non-Canadians.

Eligibility to enter the U.S.
Although not a Georgian College admission requirement, all shipping companies, whether Canadian or foreign, which have vessels trading in U.S. ports, require that all their shipboard personnel be eligible to legally enter the U.S.

TCMSS Certification
Students interested in obtaining the TCMSS engineering certificates must comply with their legal requirements as described in the Canada Shipping Act Marine Personnel Regulations. These include proof of Canadian citizenship or proof of permanent resident status and a valid marine medical certificate.

Marine Emergency Duties, Propulsion Plant Simulator, and Maritime Security courses are also requirements for certification by TCMSS. These courses are provided at Georgian College at an extra fee.

Graduation Requirements
43 Program Courses
2 Communications Courses
2 Co-op Work Terms

Graduation Eligibility
To graduate from this program, the passing weighted average for promotion through each semester, from year to year, and to graduate is 60%. Additionally, a student must attain a minimum of 50% or a letter grade of P (Pass) or S (Satisfactory) in each course in each semester unless otherwise stated on the course outline.

Program Tracking

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Program Courses</td>
<td></td>
</tr>
<tr>
<td>CHEM 1006</td>
<td>Fuel Combustion Chemistry</td>
</tr>
<tr>
<td>ENGN 1001</td>
<td>Basic Engineering Science</td>
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<tr>
<td>MARE 1040</td>
<td>Marine Engine Plants</td>
</tr>
<tr>
<td>MARE 1041</td>
<td>Marine Steam Plants</td>
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<tr>
<td>MARE 1043</td>
<td>Marine Systems and Components Blueprint</td>
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<tr>
<td>MARE 1044</td>
<td>Marine Plant Energy Distribution</td>
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<tr>
<td>MARE 1050</td>
<td>Marine Auxiliary Systems</td>
</tr>
<tr>
<td>MATH 1018</td>
<td>Introduction to Technical Mathematics</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>490</strong></td>
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<table>
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<tr>
<th>Semester 2</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Program Courses</td>
<td></td>
</tr>
<tr>
<td>CHEM 1007</td>
<td>Industrial Chemistry</td>
</tr>
<tr>
<td>ELEC 1008</td>
<td>Basic Electrical Engineering</td>
</tr>
<tr>
<td>ENGN 1002</td>
<td>Basic Control Engineering</td>
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<tr>
<td>MARE 1045</td>
<td>Hydraulics and Pneumatics</td>
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<tr>
<td>MATH 1019</td>
<td>Technical Mathematics</td>
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<tr>
<td>MCHN 2000</td>
<td>Machining</td>
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<tr>
<td>MENG 1018</td>
<td>Basic Applied Mechanics</td>
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<tr>
<td>Communications Course</td>
<td></td>
</tr>
<tr>
<td>Select 1 course from the communications list during registration.</td>
<td>42</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>420</strong></td>
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</tbody>
</table>
Semester 3
Program Courses
MARE 1046 Ship Construction for Engineers 48
MARE 2032 Advanced Marine Power Plants 144
MARE 2033 Advanced Marine Power Plants Steam 80
MARE 2034 Shipboard Materials 64
MARE 2035 Marine Power Plant Watchkeeping 32
WETC 2000 Welding 64
Communications Course
Select 1 course from the communications list during registration. 42
Hours 474
Semester 4
Program Courses
ELEC 2019 Thermodynamics 64
ELEC 2020 Advanced Electrical Engineering 96
HRAC 2002 Refrigeration and Air Conditioning 48
MARE 2019 Computer Applications and Networks 48
MARE 2038 Stability 48
MARE 3020 Ships Master’s Business for Engineers 64
MARE 3032 Leadership and Teamwork 32
Hours 400
Semester 5
Program Courses
MARE 3040 Electrical Machines Management 1 80
MARE 3041 Advanced Applied Mechanics 64
MARE 3042 Power Plant Auxiliaries Management 144
MARE 3043 Automation and Controls 1 80
MARE 3044 Steam Plant Management 96
Hours 464
Semester 6
Program Courses
MARE 3045 Electrical Machines Management 2 64
MARE 3046 Advanced Thermodynamics 80
MARE 3047 Automation and Controls 2 64
MARE 3048 Naval Architecture 128
MARE 3049 Motor Plant Management 128
MARE 3050 Ship’s Business and Maritime Law 48
Hours 512
Total Hours 2760
Co-op Work Term 1
Hours
COOP 1032 Marine Engineering Work Term 1 (occurs after Semester 3) 840
MARE 2036 Shipboard Power Plant Studies 64
MARE 2037 Shipboard Control Strategies 48
Hours 952
Co-op Work Term 2
Hours
COOP 2030 Marine Engineering Work Term 2 (occurs after Semester 4) 840
ELEC 2021 Shipboard Electrical Knowledge and Skills 96
HRAC 2003 Shipboard Refrigeration and Air Conditioning 16
Hours 952
Total Hours 1904

Graduation Window
Students unable to adhere to the program duration of three years (as stated above) may take a maximum of six years to complete their credential. After this time, students must be re-admitted into the program, and follow the curriculum in place at the time of re-admission.

Information contained in College documents respecting programs is correct at the time of publication. Academic content of programs and courses is revised on an ongoing basis to ensure relevance to changing educational objectives and employment market needs. The college reserves the right to add or delete programs, options, courses, timetables or campus locations subject to sufficient enrolment, and the availability of courses.