



Spring 2024
COURSE OUTLINE – ENGI 003W

This guide provides information on the requirements, expectations, and evaluations for Work Term 3. It should be reviewed very carefully to ensure students’ work progresses smoothly. Additional forms and information can be found on the co-op webpage at [Work Term Dates and Forms | Co-operative Education | Memorial University of Newfoundland \(mun.ca\)](#).

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CRITICAL DATES (for all work terms*):

Monday, 29 Apr 2024	Work Term Begins. Complete <i>Work Term Confirmation (WTC)</i> online in MyMUNLife.
Friday, 17 May 2024	Deadline for submission of <i>Work Term Objectives</i>
Friday, 21 June 2024	Deadline for submission of <i>Work Report/Presentation Outline</i> . Complete online in MyMUNLife.
Friday, 23 Aug 2024	Work Term ends and deadline for submission of the <i>End of Work Term Feedback Form</i> and communication component documents. Note: if mailing the forms/report, the postmark date will be recorded as the received date.
Wednesday, 4 Sep 2024	Academic courses begin for Fall Semester
Thursday, 5 Sep 2024	Oral Presentations. Students who are presenting must be prepared to present at this time. Schedule will be available before the end of the work term.

*See the Work Term Deliverables section below to determine which deliverable requirements are for your work term.

STATEMENT OF EXPECTATIONS OF STUDENT CONDUCT

Like Professional Engineers, engineering students are expected to behave in a professional manner at all times. Students are encouraged to conduct themselves in a manner consistent with the the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) code of ethics. MUN has two sets of rules to address inappropriate behaviour by students, one pertains to academic offences and the other to non-academic offences. Both sets of rules can be found in the 'Regulations' section of the University Calendar. It is strongly recommended that students read and follow these rules because the penalties can be severe, the severest being expulsion from the University.

Organizations typically provide Internet access to their employees and work term students. These organizations often have specific policies governing Internet usage, including personal use. These policies would normally be explained during the job orientation, typically during the first few days at work. Students must follow these policies and should expect that their employer will monitor usage of the Internet during the work term. Students should also limit their use of personal cell phones during working hours as they may distract from assigned work activities. If employers do not address these issues during initial orientation, it is strongly suggested that students ask their supervisor for specific guidance.

Students should also be aware of and follow their employer's rules around the use of products such as recreational or medicinal drugs and alcohol which may be legal to use but may not be permitted by their employer. The use of such products may affect a student's employability.

PLAGIARISM

Plagiarism is a serious academic offence at Memorial University. Cases involving suspected plagiarism in a student's work term deliverables will be addressed as per the Procedures for Resolution of Alleged Academic Offences by the Senate Committee on Undergraduate Studies, stated in the University Regulations section of the Memorial University Calendar.

Original work, completed wholly by you, is expected to be submitted in this course. The use of artificial intelligence tools, such as ChatGPT is not permitted for work term deliverables to the Co-operative Education Office and their use would be considered Academic Misconduct.

COURSE DESCRIPTION: ENGINEERING 003W

Engineering Work Term 3 requires greater participation in the students' engineering discipline. They become more experienced and proficient in problem solving and use of appropriate design processes. They should demonstrate speed and accuracy in their work, accept greater responsibility and be able to function with less direct supervision. Good judgement, increased initiative and improved analytical skills are expected to develop at this stage. Students should better appreciate the attitudes, responsibilities, and ethics expected of engineers.

003W LEARNING OUTCOMES / SKILLS EXPECTATIONS

There are a key set of skills that will be evaluated based on the End of Work Term Feedback Form. These skills are demonstrated in a number of ways, and considered important to an engineer's abilities. The expectations for these skills increase with progression through the engineering education program. During more junior work terms (e.g., work terms 1 and 2), students should demonstrate these skills at a beginner level, working their way to demonstrating the skill at an intermediate level (e.g., during work terms 2 and 3), before demonstrating the skills at a more advanced level in senior work terms (e.g., work terms 4 through 6). Students who meet the expectations listed below would get a rating of 3 on the 1-5 point rating scale. Exceeding these expectations would result in a rating of 4 or 5 for that skill/quality. Conversely, if a student does not meet the expectations they may receive a 1 or 2 rating for that skill/quality. The Skills Expectations for Work Term 3 are listed below:

1. **Initiative:** Take independent action in completing assigned tasks, and show motivation in seeking new work
2. **Organization and Planning:** Prioritize work assignments based on their importance, and plan and use time efficiently and productively to complete work
3. **Quality of Work:** Produce good quality work with few errors, checking own work with minimal assistance
4. **Productivity:** Independently learn new material to consistently complete an assigned amount of work on time
5. **Written Communication:** Communicate ideas and information in writing clearly, concisely, and in an organized way, with some review and editing required
6. **Verbal Communication:** Verbally express ideas and information clearly, concisely, and in an organized way, with minimal clarification required; comfortable speaking to small group

7. **Work Independently:** Work independently on assigned tasks and projects, taking direction and seeking assistance as required
8. **Teamwork:** Be an effective team member by working collaboratively and cooperatively with others, assuming responsibility and accountability for tasks, and understanding importance of the student's role within the team
9. **Problem Solving:** Analyze engineering problems, evaluate alternatives, and propose solutions
10. **Project Management Techniques:** Demonstrate understanding of project, change, and/or risk management techniques and incorporate into work as required
11. **Safety and Environment:** Identify safe and unsafe work practices, follow safety procedures, demonstrate safe work practices, and understand the impacts of engineering on health and the environment
12. **Ethics and Integrity:** Contribute to helping to resolve ethical issues, demonstrate good judgment and understand issues around conflicts of interest, and display honesty and fairness in interactions with others
13. **Appreciation of Diversity:** Demonstrate ability to work in a diverse workplace; inclusive, respectful, and work well with others when there are individual differences
14. **Adaptation to Organization's Rules and Policies:** Recognize, understand, and follow an organization's rules and policies, with minimal guidance
15. **Response to Supervision:** Openly accept direction and feedback and respond positively, incorporating feedback into work as required
16. **Dependability:** Gain the trust of others by being reliable and consistent in completing work and in meeting commitments, while demonstrating a very good work ethic

WORK TERM DELIVERABLES

Students must submit on the date indicated above the following for Work Term 3

Work Term Confirmation
 Work Term Objectives
 Career Development Report
 End of Work Term Feedback Form

A Work Report Outline is not required for Work Term 3 students completing a Career Development Report.

WORK TERM CONFIRMATION FORM

The ECEO depends on the Work Term Confirmation Form to confirm that students have arrived safely at work and for all means of contact while they are on their work term. **It is extremely important that the form is completed online in MyMUNLife within a couple of days of starting work.** Although the on-line form will appear as 'Approved' when the position is created, students must still input the required information. The WTC must be updated whether the student is in a new position, or is returning to a previous employer. If any of the information changes during the term, it should be updated online and the student's ASM-CE (Academic Staff Member in Co-operative Education) notified.

WORK TERM OBJECTIVES

Within the first three weeks of the work term, the student, in consultation with their supervisor will establish performance and personal/professional objectives for the work term. The objectives should also include identification of specific skills the student should develop in order to perform the duties and responsibilities of the position. Through this process, the student will acquire new skills or further develop existing skills required in the workplace. The key ingredient to a successful work term is the student's ability or openness to learn and/or further develop work related skills (see the Student Success Guide for more details on writing SMART Objectives). The student should submit a copy of the objectives to the ECEO for review and keep a copy for review later in the term. Students who start after the official first day of the work term should complete their objectives within the first two weeks of work.

CAREER DEVELOPMENT REPORT

The Work Term 3 Career Development Report and its evaluation criteria are described in the appropriate appendix below.

Your ASM-CE will communicate the format of your report submission which may be either a properly bound paper copy or an electronic submission. If an electronic submission is requested, it must be in the form of a single (one) professionally created PDF file that includes all required components.

CONTACT DURING THE TERM

Students will be interviewed on-site by their assigned ASM-CE on most work terms. The ECEO combines this activity with an on-going program of marketing co-operative education to potential employers. These on-site visits are typically scheduled in the middle third of the term. If questions arise early in the work term, students should contact the ECEO right away.

The Work Term confirmation information entered in MyMUNLife by students during the first week of work will allow the ECEO to communicate with students and their supervisors during the term.

WORK TERM AWARDS

Students are encouraged to give their best effort to all aspects of the work terms, which usually present many opportunities to examine the role and contribution of professional engineering to society. The chance to compare theory from the classroom with practice in the field can be very rewarding.

Work Term awards are an incentive for students to give their best effort each semester and are a way for employers to recognize their students. Employers are encouraged to nominate exceptional students for various awards each semester.

Please refer to the Engineering Co-operative Education Student Success Guide for details on awards that may be relevant.

CONFIDENTIAL REPORTS/PRESENTATIONS

Students should discuss their work report or presentation topics with their supervisors early in the term and determine if any of the material is confidential because all required work term communications

components must be submitted to the ECEO as the student's assigned ASM-CE is solely responsible for grading them. When sensitive or proprietary information is involved, the Non-Disclosure Request Form (NDRF) should be submitted. Confidential or proprietary information must not be included in any communications deliverable unless permission has been received from the employer to submit the confidential material. If there are ongoing concerns about confidential material, the student should consider changing to a less sensitive topic.

Once the NDRF is submitted, the student's ASM-CE will complete and sign an agreement that provides assurance that no information will be transmitted to any other person. Students should not submit confidential materials unless the ASM-CE has already signed a Non-disclosure agreement. All permitted confidential submissions must be watermarked or stamped "Confidential" on every page, including the front matter.

Some communications components may now be submitted electronically. Note that it is difficult for ECEO to guarantee the appropriate destruction of these electronic files. It is very important for students to discuss electronic submissions with their employers so the employer understands these limitations around confidentiality. If they are not comfortable with electronic submission of a confidential report or presentation package, the student may need to consider amending their topic or the material included.

Following an opportunity to review by the student, the communications component will be destroyed by the ECEO if submitted in paper format, or the ASM-CE will follow MUN Information Technology office's best practices to delete any electronic submissions.

TIMELY SUBMISSION OF DELIVERABLES

As students progress through the Engineering program they learn that meeting deadlines is part of the role of a professional engineer. In the case of reports and to some extent other work term documents, students should realize there are really two clients involved – the employer and the University, with responsibilities to both. Students are often challenged to meet the expectations of both these clients and this is a further measure of their ability to manage time and resources.

ASMs-CE depend on feedback from supervisors, with the last two weeks of work being a convenient time to complete these documents. Students should make an effort to discuss their report and performance during that time. The timely submission of all work term documents is taken into consideration in the performance evaluation. Receipt of the report and feedback documents allows the Engineering Co-operative Education Office to complete overall evaluations and meet the Registrar's deadline for submission of grades.

It is suggested that a final version of the report or presentation summary/slide package be submitted to the student's supervisor at least two weeks before the work report deadline. After the document is checked and cleared for proprietary information it should be submitted to the ECEO in the required format. The absolute deadline is the published end date of the work term, after which documents are considered **late**.

EXIT INTERVIEWS

Often the opportunity to grow and take on an increased level of responsibility comes with returning on a subsequent work term with an employer. This should be balanced by the potential to gain a greater diversity of experiences during the co-op program. If the nature of the work term and the potential for

additional learning exists, students are encouraged to consider returning to work with the same employer on a subsequent work term.

At the end of the work term, students are encouraged to arrange an exit interview with their employer and, separately consult with their ASM-CE to review the work term and discuss prospects for the next work term. The employer meeting would normally include the supervisor and a human resources representative.

CONTACT INFORMATION:

Telephone: 709-864-8816
E-mail: coopeng@mun.ca

Mailing address:
Engineering Co-operative Education
Memorial University of Newfoundland
S.J. Carew Bldg., EN-4021
St. John's, NL A1B 3X5

APPENDIX A WORK TERM EVALUATION

The work term will be evaluated on the basis of the work term communications component and work term performance, as described below.

Communications Component

The written (or oral) communication component is intended to develop the following skills:

- the ability to research the subject appropriately, to conduct the necessary analysis and to effectively substantiate conclusions and recommendations,
- the ability to summarize findings and communicate, in writing or orally, in a professional manner, and,
- the ability to apply concepts learned in the academic environment to learning objectives in the work environment.

The communication component will be evaluated by an ASM-CE or delegate.

Evaluation of the communication component will result in one of the following marks:

Outstanding - the communication component quality is exceptional; there is clear evidence of the following:

- comprehensive knowledge of the subject matter and principles used,
- high degree of originality and independence of thought,
- superior ability to organize and critically analyze ideas,
- outstanding ability to communicate,
- good planning,
- outstanding effort put into the production of the communication component.

To be considered outstanding, the communication component should have:

- all required sections completed, including letter of transmittal, summary and references,
- very few spelling, grammar and word processing errors,
- a professional presentation, and
- technical content verified by the employer.

Above Expectations - the communication component is of good quality with evidence of:

- substantial knowledge of the subject matter,
- moderate degree of originality and independence of thought,
- good ability to organize and analyze ideas,
- ability to communicate clearly and fluently,
- good planning,
- substantial effort put into communication component production.

Satisfactory - the communication component meets minimum requirements with evidence of:

- acceptable grasp of the subject matter,
- some ability to organize and analyze ideas,

- ability to communicate adequately,
- acceptable planning, and
- acceptable effort put into report production.

Marginal Pass - the written communication component has a number of weaknesses but would meet expectations after modifications are made. The communication component should, as a minimum, demonstrate evidence of:

- adequate knowledge of the subject matter,
- adequate ability to organize and analyze ideas,
- adequate ability to communicate,
- adequate planning, and
- adequate effort put into communication component production.

Fail - the communication component is unacceptable showing evidence of one or more of:

- inadequate knowledge of the subject matter,
- failure to complete required work,
- inability to organize and analyze ideas,
- inability to communicate,
- inability to plan the production of the communication component,
- inadequate effort put into communication component production,
- some or all of the report is plagiarised

At times, an ASM-CE may request that the student revise and resubmit their work report rather than be given a mark of **Fail**.

- When a student has been given the opportunity to resubmit the communication component, the student will not be eligible for a mark other than **Fail** or **Marginal Pass**.
- Normally, a student will be given two-weeks to resubmit the communication component.
- If the communication component is not revised to an acceptable standard within the specified time, a **Fail** will be recommended.

Work Term Performance

Work term performance is based upon several elements:

- An ASM-CE's assessment of the employer's End of Work Term Feedback Form. This form includes: feedback on the key set of skills outlined in the Learning Outcomes/Skills Expectations section above; and the ability to meet the objectives set at the beginning of the work term, taking into account the challenges and opportunities available to the student.
- Information gathered from contact with the student, employer, and others in the workplace.
- Timely receipt of all work term documentation by established deadlines, as the ability to plan and meet deadlines is essential to a Professional Engineer.

The performance marks below take into account how well the student meets these elements.

Outstanding - the student has successfully completed an excellent work term. Considerations include:

- exceeds employer's expectations in all areas,
- maintains an excellent working relationship with the ECEO,
- all documentation submitted in a timely manner.

Above Expectations - the student has successfully completed a very good work term. Considerations include:

- exceeds or meets employer's expectations in most areas,
- maintains a good working relationship with the ECEO, and
- all documentation received.

Satisfactory - the student has successfully completed a good work term. Considerations include:

- meets employer's expectations,
- maintains an acceptable working relationship with the ECEO,
- most documentation received.

Marginal Pass - the student meets the minimum requirement of the work term. The student will be monitored and is expected to improve in the next work term. Considerations include:

- did not meet all employer's expectations ,
- working relationship with the ECEO needs improvement,
- some of the documentation late or not received.

Fail - the student's performance is unacceptable, demonstrated by one or more of:

- did not meet employer's expectations ,
- poor working relationship with the ECEO, and
- most or all of the documentation not received.

Overall Work Term Evaluation

The overall evaluation of each work term will be based upon the communication component and work term performance and will result in the recommendation of one of the following grades:

Pass with Distinction - to receive a recommendation of *pass with distinction*, a student needs to obtain an evaluation of *outstanding* in both the communication and work performance components of the work term.

Pass - to receive a recommendation of *pass* a student must achieve an evaluation of *marginal pass* or better in both the communication component and the performance component of the work term.

Fail - a student receiving a *fail* in either or both the communication and performance components of the work term will receive a recommendation of *fail*.

For promotion from the work term, a student must obtain ***Pass with Distinction*** or ***Pass***.

A student who receives a grade of *Fail* on any work term will be required to repeat that work term prior to graduation regardless of whether the work term is mandatory or elective.

Students should be aware of the University's policy on plagiarism. More information can also be found on the Writing Centre's web page <https://www.mun.ca/writingcentre/understanding-plagiarism/>

APPENDIX B CAREER DEVELOPMENT REPORT

Introduction

When seeking work or contemplating a career move, engineers should understand the work opportunities that are available in a desired industry sector and the skills required for these opportunities. This means also understanding their current skill set which, is often best achieved by completing a reflective self-assessment based on current and past experiences, as well as an external review of the industry being considered. As you complete your third work term, you have already gained impactful and influential work and professional experience upon which you can reflect to identify new learning to assist in your career development. With this in mind, during your third work term, you are required to write a Career Development Report (CDR). The CDR is related to the Experience Mapping Assignment (EMA) completed in ENGI 3101 through its introspection and self-reflection requirements. The self-reflection required by this report will be further exercised in ENGI 8152.

The CDR provides an opportunity for you to conduct a self-assessment of the technical and non-technical skills that have been developed during your experiences and work terms to date. This allows you to consider your strengths and areas for future development. By evaluating your own skills and behaviors, you can gain insight that helps you to understand better where you are excelling and what may be holding you back, and help you identify future skills development goals. Self-assessments are important for both career growth and personal growth.

In the CDR you also discuss how career choices have been made, articulate your short to long-term career goals, identify and research an industry sector where you would like to work in a future co-op work term(s), discuss the job market and job skills required in a potential future industry sector of interest, and create a plan to develop the skills required for work in that area. Preparing this report will provide further insight into the external factors influencing employment in industries. One method of performing this external review of an industry is by performing a *Political, Economic, Social, Technological, Legal, and Environmental* (PESTLE) analysis.

To better understand how the external environment of an organisation or industry affects it, a PESTLE analysis can be completed. PESTLE involves researching an industry from six different perspectives to provide an assessment of what is happening in the industry's sector. It is important for this activity to have value that the information be appropriately researched including citations, and not be anecdotal or based on personal beliefs. For the purpose of the CDR, a modified PESTLE analysis will be conducted and will be explained in the relevant sections. The six factors of the full PESTLE analysis are:

- Political: Influence of government priorities on the industry/organisation
- Economical: Economic factors which may impact in the short, medium and long term
- Social: Influences of population, demographics, culture and trends
- Technological: Innovations in technology that could affect the industry/organisation
- Legal: Legislation that affects the operations of an industry/organisation
- Environmental: Climate and weather impacts, and geographical location¹

¹ <https://le.ac.uk/career-development-service/interviews-and-assessments/interviews/typical-interview-questions/commercial-awareness/pestle>

If you are interested in continuing to work in your current industry, you can discuss that industry for the CDR by exploring your current sector in more detail, or another sector of interest within that industry. For example, if you want to continue to work in the communications industry, you can write about your current sector (e.g., wireless communications) or explore another sector of interest (e.g., networking). A list of possible Industry Sectors is provided in a section below.

For useful resources to assist with the completion of this Communications Component deliverable, see the Brightspace shell here: [Work Term Communications Components – Online Support Materials](#)

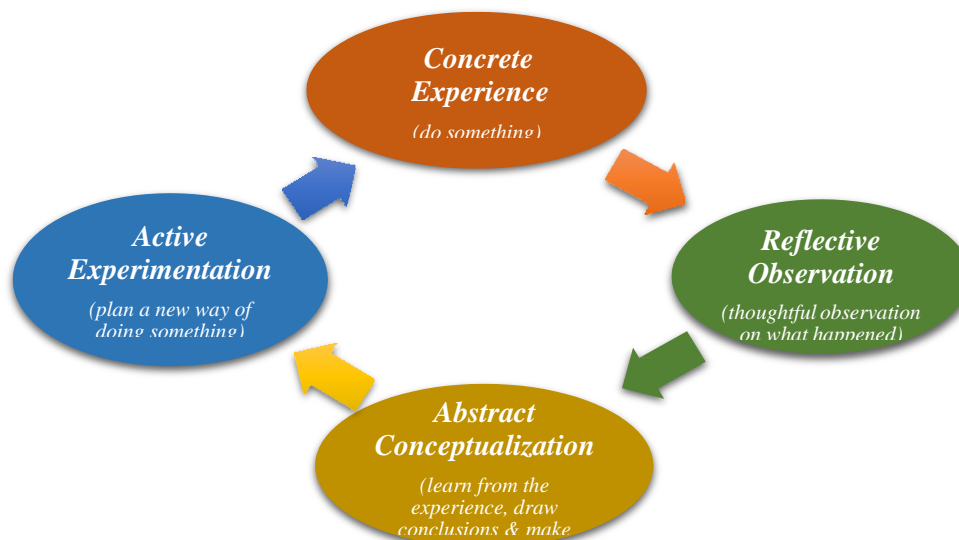
Reflection and the Experiential Learning Process

Through Co-op work terms, students learn by being directly involved in an experience rather than by just passively receiving information. This is a learning process that is often described as “learning by doing”. In this process, the “doing” is important, but thinking about what has happened is essential, particularly thinking about new skills that were developed, new attitudes, new approaches, and new ways of thinking that result from the experience. Thinking about experiences in this way is called “reflection”. Reflection is a thoughtful analysis of the process and the outcome, resulting in learning and growth. This process is sometimes discussed as the “what” and the “so what?” Reflection is a key element of the Experiential Learning Model, which the Co-operative Education learning model is based upon.

David Kolb, the educational psychologist, explored the process of experiential learning, and is renowned for his Experiential Learning Model, shown in the figure below². Kolb identified that learners can join this cycle at any point, but that authentic learning takes place when the learner executes all four stages of the model:

- 1) participating in an experience (do something),
- 2) critically reflecting on that experience (thoughtful observation),
- 3) identifying learning gained from the experience and how it can be applied in the future (learn from the experience), and
- 4) testing out that new learning (plan a new way).

Experiential Learning Model: A Four Stage Cycle of Learning



² <http://academic.regis.edu/ed205/kolb.pdf>

Critical reflection, mentioned above, goes beyond just describing experiences. The process of critical reflection “questions personal assumptions or biases, connects theory to experience, addresses the ways in which theoretical knowledge and experience differ, and considers multiple perspectives and creates evidence of new learning.”³ Critical reflection is a crucial part of experiential education and reflective writing is one of the methods used to measure the depth of a student’s reflections.

The process of writing this CDR engages students in thinking about each aspect of the entire Experiential Learning Process. It will engage a student in:

- Describing their experiences and providing concrete examples of that experience
 - What happened?
 - How did you feel?
 - How did you react?
 - What choices did you have?
- Reflective Observation
 - What skills and abilities did you use?
 - Identify what worked and what needs improvement.
- Abstract Conceptualization
 - What conclusions can be draw?
 - What was learned?
 - How can this be applied to another situation?
- Active Experimentation
 - What can I do differently this time?
 - Create a plan to implement learning.

Material in the **Reflection and The Experiential Learning Process** section above is adapted from “Guidelines: Co-operative Education Work Term Assignments”, Faculty of Science and Faculty of Humanities and Social Sciences Co-operative Education Programs, Memorial University of Newfoundland.

Industry Sectors

The following is a list of industry sectors in which engineers typically work. It can help identify the industry sector in which a student is currently working and/or would like to work during a future Co-op work term(s). The list contains many examples, but is not exhaustive. Students may choose to explore sectors that are not listed below.

Construction

- Building, General Contracting
- Infrastructure construction and maintenance (road/bridges/rail/ subway)
- Shipbuilding
- Marine structures
- Offshore structures

Communications/Utilities

- Telecommunications
- Power Generation, Transmission, Distribution

³ www.heqco.ca/SiteCollectionDocuments/HEQCO_WIL_Guide_ENG_ACC.pdf

- Water Supply
- Sewage Systems

Natural Resources/Energy

- Renewable/Alternate Energy Production
- Oil & Gas Extraction (onshore/offshore)
- Mining
- Environmental Engineering/Remediation

Manufacturing

- Chemical/ Petrochemical/Refinery
- Metal/Metal Products/Machinery
- Aerospace and Aviation
- Pharmaceuticals
- Biomedical/Biotechnology
- Robotics
- Consumer Products
- Nanotechnology
- Automotive
- Food/Beverage
- Computers/Electronics/Semiconductors
- Electrical Machinery/Equipment
- Wood Products/Pulp/Paper

Transportation & Warehousing

- Pipelines
- Water/Air/Rail/Transit/Transport
- Ports

Services

- Research and Development
- Government (Municipal, Provincial, or Federal)
- Defence and Security
- Computer Programming/Software
- Computer Related Services/Hardware
- Consulting (various)
- Materials Testing
- Charitable Organization (not-for-profit)

Confidentiality

This work term deliverable is intended to be a personal reflective document that does not require supervisor review at the end of the work term prior to submission to the Engineering Co-op Office. This notwithstanding, depending on an employer's confidentiality protocols, some supervisors may be required to conduct a review of any material to be submitted to the ECEO at the end of the work term. At the beginning of the work term, students should confirm with their work term supervisor whether the CDR may need to be reviewed for confidentiality purposes prior to submission. The content of the CDR must

be such that it is able to be submitted and evaluated by the ECEO (i.e., removed from the workplace for marking). When developing the CDR, avoid including company sensitive information in the document related to the current employer.

General Report Guidelines

Please follow the general guidelines listed below:

- The report should be a **minimum of 4000 words**, excluding illustrative figures and tables, the self-assessment, and the updated résumé.
- When determining report length, word count begins with the introduction and ends with concluding statements. It does not include the back matter (i.e. reference list, appendices), or any front-matter (i.e. material before the introduction).
- For reports longer than twice the indicated minimum word count above, students should contact their assigned ASM-CE to discuss further.
- The report must be written in a formal style. This means that students should use formal wording, and avoid colloquialisms, slang, and the use of contractions.
- In the case of the CDR, the report **should** be written in **first person**.
- Terms such as “I” and “We” should be used throughout the report.
- The use of illustrative figures, tables, etc. is encouraged to help support the discussion.
- An Executive Summary is not required due to the reflective nature of the document and the intended audience.
- Other than the items noted above, all other general report guidelines are the same as the Short Descriptive Technical Report in the Work Term 1 Course Outline.

Structure

The general structure of the CDR is as follows:

- Cover Page
- Letter of Transmittal
- Title Page
- Table of Contents
- Introduction (~5% of content)
- Overview of Current Employer (Where Are You Now?) (~10% of content)
- Exploration of Engineering Related Career Choices (How Did You Get There?) (~15% of content)
- Skills Development Through the Work Terms (What Skills Did You Develop?) (~20% of content)
- Short, Medium, and Long-Term Career Goals (What Are Your Goals?) (~10% of content)
- Future Industry of Interest (Where Do You Want to Work Next?) (~15% of content)
- Identifying Required Skills and Skills Development Planning (How Will You Develop the Required Skills?) (~20% of content)
- Concluding Statement (<5% of content)
- References
- Appendices

Content estimates for each of the main sections of the report are included above. These are intended to provide guidance to help determine the approximate amount of content expected in each section. Note that these are suggested amounts, not firm limits.

Detailed Description of Report Sections

See the Work Term 1 Course Outline for the guidelines for the front matter (e.g., Cover Page, Table of Contents, etc.).

Introduction (~5% of content)

Provide a general introduction to the contents of the report, and a summary of your work terms to date. Include the following:

- A statement of purpose that defines what the report is to achieve.
- A statement of scope that outlines what the report covers and any limitations that may be imposed on the report.
- A summary of your previous and current employer(s), your roles, and major tasks/projects.

Overview of Current Employer (~10% of content)

Provide an overview of your current employer, and discuss the external factors influencing employment with the employer. Include the following:

- A brief overview of the employer/organization.
- A brief introduction to the industry sector in which it operates (i.e., how long has the sector existed, major changes to the industry over time, size?)
- Discuss the influence of two of the following external factors affecting employment with this employer or industry (those that have the largest influence). This exercise is based on the PESTLE analysis, which has been modified here to align with the goals of the CDR. Some of the PESTLE elements are combined as they are related. This research into the industry should contain citable sources. Anecdotal examples, or personal opinions that are not backed up should not be included.
 - Political and legal factors (e.g., infrastructure, labour law, trade restrictions, etc.)
 - Economic factors (e.g., interest rates, economic growth or recession, etc.)
 - Environmental and societal aspects (e.g., ageing populations, health consciousness, climate change, etc.)
 - Technological (e.g., automation, R&D activity, rate of technological change, etc.)
- Work environment (e.g., remote work, unionization, shift work, etc.) if this is an important factor for this industry.
- Opportunities for engineers and in which engineering disciplines. Are engineering opportunities being developed or lost in this industry?

Exploration of Engineering Related Career Choices (~15% of content)

Explore how you have made engineering-related career choices to date. Include the following:

- Why did you select your current and previous engineering work terms or how they were attained, outlining your thinking and planning processes?

- What was your job search process and how did this impact the positions you attained? This may include a discussion about what type of positions you sought and how many applications you submitted and when. Reflect on what worked in the job search process and what did not. Did you prepare adequately for interviews? What went well and what could be improved during interviews. Also discuss networking, your job search outside MyMUNLife, or the use of other job search tools. What could be improved in your job search process?
- Were the acquired positions based on interest, a network of contacts, availability of jobs, job search effort (corresponding with work and academic experience), skills possessed or not possessed, or a combination of some or all these elements?
- If you returned to a previous employer, discuss why. Were there specific goals that you wanted to achieve, additional responsibilities to take on, new skills to learn, or the opportunity to deepen your knowledge about a particular topic.
- How has this knowledge/insight/awareness influenced how you will conduct future job searches and make career choices?

Skills Development Through the Work Terms (~20% of content)

First, fill out a copy of the Skills Self-Assessment Form for the Career Development Report (SSAF) and include it as Appendix A (not as a separate file). The form is found at:

[Skills Self-Assessment Form for the Career Development Report](#)

- As per the instructions on the form, complete a self-assessment for the 16 skills/attributes which are part of the Employer End of Work Term Feedback Form
- Add three (3) additional Technical Skills that are important to your field/industry of interest and evaluate your skill level against where you feel these skills should be as a Work Term 3 student.

Further guidance on filling out the SSAF is provided at the end of this section.

Next, provide an overview of technical and non-technical skills developed on the previous two work terms and the current work term reflecting upon the self-assessment just completed. Discuss how your previous experiences have helped develop these skills to get to the self-assessed level. Include the following:

- The top three (3) to five (5) technical skills required to be effective in the current position and previous roles. These should include the ones you indicated on the SSAF.
- The top three (3) to five (5) non-technical skills (personal qualities/attributes) required to be effective in the current position and previous roles. Where possible use the same terminology that is used in the SSAF.
- Explore how you have developed these skills. Some ways in which skills may have been developed are included in the list below (discuss those that are applicable).
 - Professional development events attended during your work terms. These may include networking events, technical training courses, and seminars. Outline how the events have helped to develop the skills required for the current position.
 - Any experiences that you may have had with a mentor while on a work term (any person who is providing guidance in skills development and career progression). Describe how these experiences have helped you to develop professional skills.

- Any other key learning experiences that have had an impact on skills development, including volunteer or team activities outside your normal work duties, providing examples to demonstrate how specific job-related skills were developed.
- Discuss why you ranked yourself at the level that you did.
- Reflect on feedback received in previous work terms and how this feedback has helped in your goal setting to identify skills to further develop.
- Comment on how the skills developed in one work term led to the next work term, or may have influenced specific work assignments on subsequent work terms.

Note: The above items can be discussed per work term (i.e., using work term numbers as subsections) or separated into technical and non-technical skills development.

Further Guidance on Completing the SSAF:

Descriptions for each of the skills/attributes are provided on the form. They describe the average level of competency for that skill/behaviour for students in work term three. “Competent” is the average level, with “Above Expectations” and “Outstanding” above, and “Not Developed” and “Developing” below the average level of competency. Indicate your perception of your current ability level for each of the skills/attributes. Be as objective as possible.

Be honest, but also take pride in the skills that you have demonstrated well and rank yourself accordingly. Think about examples where these skills have been demonstrated at or above the level expected for your level of education and experience. You should also identify which are areas for future development. Think about where you need to improve based on past supervisor or team feedback or the goals that you set for yourself, which may not have been fully achieved. Think about experiences when you didn’t perform to expectations, which taught you a valuable lesson. Recognizing one’s own areas for development is important in the process of learning and growing.

Note: A valuable activity is to compare how your self-assessment aligns with your supervisor’s assessment (where items overlap) to see if there are discrepancies. Sometimes, how other people see you is not how you see yourself, and it is important to be aware of this and understand why this is so. Discrepancies may be due to self-bias or the supervisor may not have properly observed the level of the demonstrated skill. This activity is not required for the CDR; this information is provided for future consideration.

Short, Medium, and Long-Term Career Goals (~10% of content)

Discuss short, medium, and long term career goals. As much as possible these should probably align, or flow to with the future industry of interest in the next section. Typical timelines are: short term - next work term; medium term - first post-graduation job; and long-term - five years after graduation. These are guidelines; you may select timelines that work best for your goals.

You may find that short and medium goals are more specific and longer term goals are a little more generic as it can be more difficult to see further out. Some students may find performing an Envisioning Exercise may help them more easily consider their future to develop these goals. There are a number of examples available on-line.

Include the following:

- List short, medium, and long-term career goals (i.e., where do you want to see yourself and what do you want to accomplish in your career in these time periods?).
- Describe how setting goals (short, medium, long-term) has assisted you so far in your skills development. When discussing goal setting and goal achievement, you may reflect on the SMART goal setting framework described in ENGI 200W and the Work Term Objectives Form and used to write your work term learning objectives.

Future Industry of Interest (~15% of content)

Introduce and review an industry sector in which you would like to work in your senior co-op work term(s) based on your own experiences, current industry awareness, and career goals described in the last section, outlining the factors influencing employment in that industry. Note that you may not want to work in the same industry in which you have been working thus far, and may wish to consider work in a new one. This is helpful as this gained knowledge about your likes, dislikes, and aspirations is a part of the experiential learning process. If you are interested in continuing to work in your current industry, you can explore your current sector in more detail or another sector of interest within that industry. Include the following:

- Name the industry and discuss whether this is a new industry for you to explore, an industry and sector in which you are working in now or have in the past, or a new sector within an industry in which you have worked, including the thinking behind the change of course or the continuation on the same or similar path.
- A brief introduction to the industry sector (i.e., how long has the sector existed, major changes to the industry over time, size?).
- Geographical location of the industry (i.e., would you work in this geographic area, would you relocate if necessary?).
- Discuss two of the following external factors affecting employment in the industry (those that have the largest influence). This exercise is based on the PESTLE analysis, which has been modified here to align with the goals of the CDR. Some of the PESTLE elements are combined as they are related. This research into the industry should contain citable sources. Anecdotal examples, or personal opinions that are not backed up should not be included. If you have selected the same industry as earlier in the report, then select two different factors to discuss here.
 - Political factors (e.g., infrastructure, labour law, trade restrictions, etc.)
 - Economic factors (e.g., interest rates, economic growth or recession, etc.)
 - Environmental and societal aspects (e.g., ageing populations, health consciousness, climate change, etc.)
 - Technological (e.g., automation, R&D activity, rate of technological change, etc.)
- Work environment (e.g., remote work, unionization, shift work, etc.) if this is an important factor for you, or this industry.
- Career opportunities (current hiring trends and potential career advancement). Are engineering opportunities being developed or lost in this industry?
- Explore one to two (1 to 2) employers in this industry where you would consider working. For each employer, provide the following:
 - Name of company, and division (if applicable)
 - Location (city, province/state, country)
 - A brief description of the company, or division

- The reason the company was selected (e.g., innovative, progressive, aligned with discipline, aligned with student values, advancement opportunities, professional development opportunities, location, size of organization, compensation package, etc.).
- Discuss how work in these industry sector(s) or with these employer(s) is aligned with your short, medium, and long-term career goals; as well as your personal beliefs and values.

Identifying Required Skills and Skills Development Planning (~20% of content)

Outline the technical and non-technical skills that are required to obtain a senior Co-op work term in the industry sector identified in *The Future Industry of Interest* section above and propose a plan for developing these skills. Include the following:

- Identify the technical and non-technical skills that are required to be effective in a role in the desired industry sector identified in the previous section.
 - Review current engineering job descriptions in this industry sector to determine the skills required.
 - Online resources such as LinkedIn, Talentegg.ca, Indeed.com, and individual company “Careers” web pages may assist in this research.
- Based on your current skill set, identify the top two to three (2-3) skills that need to be developed to become (more) marketable for these positions and develop a plan to accomplish that.
 - Identify current strengths and two to three (2-3) top areas for further development related to the identified industry/job, also considering the previously completed SSAF, and any feedback received from past employers.
 - Identify obstacles (if any) previously experienced in developing the required skills to work in a desired industry, and note steps that can be taken to mitigate or overcome these obstacles in the future.
 - Outline a plan to develop the required two to three (2-3) top skills to the needed level. Include how you will further develop existing skills and start developing new required skills (e.g., academic course selection, seminars, online courses, project team involvement, extra-curricular activities, volunteer work, mentoring, attendance at conferences or other professional events, etc.). These plans should include specific actions/activities that you intend to take to be successful
- Discuss why lifelong learning is important as it relates to career development. How will you continue to maintain the skills needed to progress your career in an ever-changing world?

Concluding Statement (<5% of content)

Provide final reflections on your co-op experience and strategy to obtain your next Co-op position. Include the following:

- Reflect on key learnings from your co-op experiences so far.
- Reflect on the learning that has occurred as a result of completing this report including strengths and plans to address areas for further development.
- Re-state your high level career goals.
- Re-state the strategies that could assist you in attaining those goals.

References

Common to all communication components. Please refer to the Referencing Appendix below.

Required Appendices

- Completed Skills Self-Assessment Form
- Updated Résumé (which includes the current work experience).

The résumé can be a one or two-page résumé. Select whichever length is best suited to the industry in which you are interested in working during your next work term. If submitting electronically the resume may be submitted as a separate file. This will permit your assigned ASM-CE to provide feedback more quickly.

Evaluation

The CDR will be assessed according to the following:

Structure and Format

Structure

- Cover and Title Page are included
- Letter of Transmittal is included
- Table of Contents is included and appropriately formatted

Format and Organization

- Report folder/binding is appropriate
- Appropriate font used
- Correct use of page numbering
- Length of the report is appropriate; not shorter than minimum requirements
- Layout is easy to read
- Section headings are used and are numbered and named appropriately
- Sections properly formatted and contain appropriate material
- If used, tables and figures are properly formatted and referenced in the text
- Material is cited and referenced where required

Content

- Demonstrated understanding of current employer and role
 - Description of the current employer
 - Observation of student's place within the organization
 - Observation of the political/economic/etc. factors that affect the industry
- Demonstrated understanding of how career choices have been made to date
 - Description of choices made to date
 - Concrete examples provided of how job searches were completed
 - Reflective observation of how successful search techniques were
 - Discussion of what to do differently in the future
- Demonstrated understanding of skills development through the work terms
 - Description of the skills required to be successfully in the current industry
 - Concrete examples provided of where/how these were developed
 - Reflective observation of experiences with mentors
 - Conclusions drawn on how these skills led to the next opportunity

- Demonstrated understanding short, medium, and long term career goals
 - Discussion of goals
 - Observation of how goal setting has led to success in the past
- Demonstrated understanding of a future work term industry sector or subsector of interest
 - Description of the industry
 - Observation of the political/economic/etc. factors that may affect the industry
 - Concrete examples of potential employers provided
 - Conclusions drawn of how this aligns with career goals
- Demonstrated understanding of skills required to work in the identified future industry and a plan to develop those skills
 - Concrete examples of required skills provided
 - Reflective observation of how these skills may need to be enhanced and potential obstacles
 - Plan proposed for developing these skills, including maintaining skills through lifelong learning
- Self assessment form is included
- Updated résumé is included

Referencing and Resources

- Consistent referencing style is used throughout (e.g., IEEE, APA)
- Number of references listed is sufficient
- Material is consistently/properly referenced
- In-text citations are included where required
- Use of direct quotes is avoided
- Variety of reference material is used
- Reference material is taken from a valid source; has authority

Communication Effectiveness

- Use of contractions is avoided
- Vague language is avoided; material is qualified and quantified
- Ambiguous pronouns are avoided
- Unnecessary wordiness and redundancy is avoided; writing is concise
- Figures of speech are avoided
- Run-on sentences are avoided
- Definitive language is supported with evidence
- Word choices are appropriate
- Formal writing style is used
- Acronyms are correctly defined
- Punctuation is correct
- Spelling is correct
- Grammar is correct
- Parallel construction is used in sentences and lists
- Sentence structure is correct
- Paragraph structure is appropriate (one main concept with supporting details)
- Writing is clear
- Content is written for the appropriate audience
- Tables and figures included (if required) to support descriptions

APPENDIX C REFERENCING

Introduction

Referencing is the act of acknowledging the sources of material and information used in a document. Not properly including these acknowledgements may be considered plagiarism. Citations and a corresponding reference list is how referencing is achieved. The citation is included in the body of the writing to indicate the exact material that originates from another source, the List of References includes the details on where that source can be found.

Citations and a List of References are used together to provide the appropriate information to indicate what material is from another source, and the details to document the original source. They are required for all sources of information included in the report – print, online, and word of mouth (personal communication). When using material found online, students should be careful to rely only on valid, trustworthy sites. Wikipedia, for instance, can be changed by any user and is therefore not a valid site for obtaining technical information.

There are four main reasons why writers need to reference material within their reports, including:

- 1) It allows proper credit to be given to the authors and/or source of the information cited and allows the reader to distinguish between the writer’s own ideas and the referenced information.
- 2) It demonstrates that the writer has researched the claims and ideas put forth and supports these ideas with evidence and information from other sources.
- 3) It allows the writer to share their information sources with readers so that they can find that same resource material, if needed.
- 4) To avoid concerns around plagiarism, and the possible negative consequences.

General Guidelines

Please follow the guidelines listed below:

- The List of References should only contain entries for works cited directly within the report. That is, each reference in the list must have at least one in-text citation.
- Information from the sources should not be “cut and pasted” but instead paraphrased or summarized to offer support for the writer’s own ideas.
- Even when a citation is included, copying material directly from the source without changing the wording is considered plagiarism if the material is not in quotation marks.
- Technical reports will rarely, if ever, include information enclosed in direct quotes. Direct quotes are only used when the information cannot be paraphrased (re-written in a student’s own words) without altering the meaning.
 - To decide if a direct quote should be used, writers need to ask themselves the following question, “Can I re-write this in another way and still maintain the original message or meaning?”
 - If the answer to this question is yes, don’t quote – paraphrase.
- All diagrams or images that are not the personal creation or capture of the author must be correctly cited.
- Information obtained from conversations or interviews must be cited in the report but these sources do not appear in the reference list. This can be done in one of two ways, as follows:
 - Introduce the paraphrased information similar to this: “In an interview with John Smith on August 22/18, he suggested ...” OR

- Add the following citation at the end of the paraphrased information: “..... (Personal communication, John Smith August 22/18)”.
- The List of References is only for works cited directly within the report.
- A Bibliography is a list of documents that have been read, but not directly or indirectly quoted.
- A Bibliography should only be included as needed, and in addition to the List of References.
- Work reports rarely have, or need a Bibliography, they almost always have a List of References.
- General information that can be considered public knowledge in the field need not be referenced.
- The requirement for precise referencing is greater for academic and scientific reports than for business and other technical reports; however, all reports must be referenced to the level that an interested reader can identify the sources and obtain them if desired.

Additional guidelines on referencing can be obtained from the library or online at:

<https://www.mun.ca/writingcentre/understanding-plagiarism/>

https://www.mun.ca/engineering/undergrad/technical_communications/CitingAndReferencing.php

Referencing Using IEEE

While students may choose any referencing style, however for consistency and versatility, the ECEO strongly recommends the IEEE style. For IEEE the List of References is listed in the order the material is first presented in the report.

An example of the IEEE format from the style guide <https://ieeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf> is shown below.

Book

[#] Author(s). Book title. Location: Publishing company, year, pp.

Example:

[1] W.K. Chen. Linear Networks and Systems. Belmont, CA: Wadsworth, 1993, pp. 123-35.

World Wide Web

[#] Author(s)*. “Title.” Internet: complete URL, date updated* [date accessed].

Example

[2] M. Duncan. “Engineering Concepts on Ice.” Internet: www.iceengg.edu/staff.html, Oct. 25, 2000 [Nov. 29, 2003].

E-mail

[#] Author. Subject line of posting. Personal E-mail (date).

Example:

[3] J. Aston. “RE: new location, okay?” Personal e-mail (3 Jul, 2003).

Non-published sources such internal or unpublished documents

J. K. Author, “Title of report/paper,” unpublished.

Examples:

[4] B. Smith, “An approach to graphs of linear forms,” unpublished

Other non-recoverable unpublished sources such as interviews or phone calls do not require a reference, or citation; however the author or source must still be acknowledged in the text. This is explained in greater detail on the Engineering Technical Communications page as listed above.