Department of Chemical Engineering
Reflective Work Term Report Guidelines

Due to the extraordinary circumstances associated with the COVID-19 pandemic, Chemical Engineering students who need to submit a co-op work term report based on the Winter 2020 to Fall 2021 co-op terms may submit either a technical work term report or a reflective work term report.

This document provides a reminder about the grading structure and, because the option to submit a reflective work term report is new for Chemical Engineering students, the Reflective Work Term Report Objectives and the Reflective Work Term Report Marking Rubric. Note that we are currently planning for the Fall 2021 work term to be the last one for this pandemic accommodation.

Thanks to Erin Kelly and her colleagues at WatPD, who developed much of the information in these guidelines.

Grading
The WKRPT 200/300/400 course is of type DRNA. It is a degree requirement, but it does not contribute to your GPA. If you receive a failing grade for this course, however, then it will be included in your fail count.

Reflective and technical work term reports will be graded on the same scale; you will receive a numerical grade from the following set:

- Outstanding: 95%
- Excellent: 89%
- Good: 75%
- Satisfactory: 65%
- Unsatisfactory: 38%
- Resubmit

Reflective work term reports will be graded using the rubric provided at the end of this document and mapped to the closest grade from the set above. It is not possible to assign other numeric grades for this course.

Objectives
Your reflective work term report is about you and the things you learned during your co-op work term.

Ideally, your learning builds throughout your degree, from term to term, on and off campus. One experience informs the next. Your experiences are connected. Only you can fully see how everything is related, but your reflective work term report gives you the opportunity to share your insights about your learning in a meaningful, personalized way.
Over the course of your degree, your collection of work term reports will describe the arc of your professional, academic and personal development, and how those three aspects of your education evolve together.

In your reflective work term report, you will describe your work term experiences in general terms, in a manner similar to the way you will update your résumé after this term. If you are uncertain, ask your supervisor about how to most effectively answer future co-op interviewers’ questions about the engineering experience you gained this term.

Your submission will likely be five or six pages long, but write as much as you need to express yourself fully. There is no penalty or grade advantage related to word count.

Note: If you work with proprietary technology or processes, your employer may prefer that you write a reflective work term report.

Support Materials
The Reflection and Reflective Writing section below provides some tips and additional resources to help you understand the expectations of this report and develop the related skill set.

The Reflective Work Term Report Template provides the foundation for your report. It includes two parts. Part A: Experiences this Term and Part B: Looking Ahead. Read the questions on the template carefully, and write your responses in the template file.

The PEO’s Pre-graduation Experience Record Form section, below, provides additional information to help you complete Part A of the template in a manner that meets the professional expectations of the Professional Engineers of Ontario (PEO).

Reflection and Reflective Writing
Reflection is thinking about an experience. Reflective writing enables you to communicate those thoughts. Learning how to intentionally reflect on your professional and academic experiences is the foundation of self-awareness. Learning how to write reflectively enables you to capture and share your observations, insights and decisions.

For most students, reflective essays are a new type of writing. You may want some help to learn how to reflect on your experiences in a systematic, productive way. You may want some suggestions on how to organize and express your thoughts in writing.

WriteOnline.ca’s Reflective Writing Guide
WriteOnline.ca’s Reflective Writing Guide is a great resource to help with your reflective writing. This writing tool was created by Wilfrid Laurier University, University of Guelph and University of Waterloo. Pay particular attention to the following:

- The definition of reflective writing in Section A: Overview.
- The five models of reflection. The simple ‘What-So What-Now What’ model described in Section B: How Can I Reflect? does everything you need for your reflective work report, but you may prefer to use one of the other models.
• **Section C: How Do I Get Started?**, including the ‘Types of Reflective Assignments’ and ‘Understanding the Expectations of Reflective Writing’ subsections, which explains how to write a short, personal reflection in a conversational tone.

• The ‘DEAL’ model for reflective writing, which is in **Section D: Writing a Reflection** under the ‘Three Models for Reflective Writing’ subsection.

• The **Reflective Toolbox** worksheet, which provides practical questions to guide anyone using the DEAL model for reflective writing.

**PEO’s Pre-graduation Experience Record Form**

To become a licensed engineer, Professional Engineers Ontario (PEO) requires that you obtain and document four years of acceptable professional experience. Experience gained after the mid-point of your degree can be counted towards this requirement.

Part A of the reflective work term report is derived from PEO’s Pre-graduation Experience Record Form. Consultations with previous CHE cohorts indicated that many students find it challenging to complete these forms. The following information, which provides a guide for your responses, may be useful if you pursue professional licensure.

1) **Show how you will add the experience you gained this term to your engineering résumé:**

This question is intended to help you make connections between the knowledge and skills you gained this term and consider how these may be of interest to employers in an engineering or non-engineering industry. Remember, while your experience may not be related to engineering directly, it’s possible for you to link your work to overarching engineering principles, theories, methods and techniques.

Here are some examples to help you get started:

• I **reviewed** my preliminary findings (be specific) with senior engineers (include form of communication) in order to identify next steps (outline short-term and/or long-term goals). *This will be helpful in a future engineering position because...*

• I **assessed** safety concerns and risks of engineering activities to identify hazards and potential harm. *This will be helpful in a future engineering position because...*

• I **selected** and **applied** an appropriate law to solve problems involving physical and chemical equilibrium and rates of reaction and then **explained** my reasoning to others in the field of chemistry. *This will be helpful in a future engineering position because...*

• I **coordinated** phases of project work, monitored expenditures and schedules, and took corrective action (be specific). *This will be helpful in a future engineering position because...*

• I **communicated** engineering information graphically (formal or informal), in writing, and/or verbally to ensure understanding of the intended audience. *This will be helpful in a future engineering position because...*
2) Answer each question below as you would in an interview.

Your responses in this section will help you practice choosing a good story to effectively highlight your relevant experiences to an employer. The STAR model is ideal for drafting your response to each question:

- The SITUATION was...
- My TASK was...
- The ACTIONS I took were...
- The RESULT was...

Remember to make the key connection in your response: This experience means/shows/proves that...

2a. In your work experience this term, how have you applied engineering fundamentals in one of the following: analysis, design or synthesis.

As you move through each prompt, remember to ask yourself: ‘Do I need my engineering studies to do this job? If so, how?’

PEO provides a list of topics related to each of the five quality-based criteria. We’ve included some examples below. For more information on PEO’s engineering work experience requirements, look in the ‘Resources’ section at the end of this document.

- Analysis: scope, operating conditions, performance assessment, safety and environmental issues, technology assessments, reliability analyses, economic assessments
- Design: functionality, product specification, component selection, integration of components into larger system
- Synthesis: integration of components and sub-systems into larger systems to satisfy a given functional design specification

2b. Respond fully to two questions below (you may delete the questions you do not answer).

In your work experience this term, how have you applied engineering fundamentals in one of the following: testing methods or implementation methods.

PEO Examples

- Testing methods: devising testing methodology, techniques, verifying specification, new product/technology commissioning
- Implementation methods: applying technology, engineering cost studies, optimization techniques, cost/benefit analyses, process flow and time studies
Describe your practical engineering experience this term in relation to the function of components as part of a larger system, limitations of practical engineering, significance of time in the engineering process, knowledge and understanding of codes, standards, regulations and laws.

**PEO Examples**
- Function of components as part of a larger system: merits of reliability, role of computer software, relationship of end product to equipment and control systems
- Limitations of practical engineering: production methods, manufacturing tolerances, operating and maintenance philosophies
- Significance of time: workflow, scheduling, corrosion rates, replacement scheduling
- Codes, standards, regulations, laws: what codes and standards did you use as part of your engineering work? Why was it necessary to refer to these?

Describe a situation from this term involving planning, scheduling, budgeting, supervision, project control, and/or risk assessment.

**PEO Examples**
- Planning: identifying requirements, developing concepts, evaluating alternative methods, required resources
- Scheduling: establishing interactions and constraints, activity schedules, impact of delays, interaction with other projects
- Budgeting: conceptual and detailed budgets, identifying labour, materials, overhead, cost escalation
- Supervision: leadership and professional conduct, human resources, motivating teams
- Project control: coordinating phases of project work, monitoring expenditures and schedules, and taking corrective action
- Risk assessment: operating equipment and system performance, technological risk, product performance, social and environmental impacts

Communication Skills: In your work experience this term, describe how you communicated your engineering ideas through written work, oral presentations and presentations to the general public.

**PEO Examples**
- Written work: correspondence, design briefs, major reports
- Oral reports: coworkers, supervisors, senior management, clients, regulatory authorities
- Presentations to the public: any other examples of having to promote your engineering ideas through a reporting mechanism?
Describe a situation you were in this term that involved the benefits of the engineering work to the public, safeguards, the relationship between the engineering activity and the public, and/or the role of regulatory agencies.

PEO Questions to Consider

- What are the potential effects, both positive and negative, of the engineering project?
- How are negative effects mitigated?
- Who are the end users of the engineering work?
- Were they consulted on the project? How?
- What involvement have you had in the process?

Resources

- For more information on PEO’s five quality-based criteria, see the Guide to the Required Experience for Licensing as a Professional Engineer in Ontario (see Section 2.2).
- This Engineers Canada web page includes discipline-specific theories and knowledge that may help remind you of terminology in your field. The chemical engineering document includes fundamental topics that you can speak to in this work report.
- The Licensing Guide and Application for License resource provides an overview of PEO’s engineering work experience requirements (beginning on page 6).
## Marking Rubric, Reflective Work Term Report

### Part A: Experiences this Term (Primer)

<table>
<thead>
<tr>
<th>Exemplary</th>
<th>4 pts</th>
<th>Developing</th>
<th>2 pts</th>
<th>Unacceptable or Missing</th>
<th>0 pts</th>
</tr>
</thead>
</table>

#### Part A, Question 1: Adding experience to engineering resume
- **Exemplary** 4 pts
  - You include a clear description of your engineering or non-engineering duties and how you will add the experience you gained this term to your engineering résumé.
  - (When describing engineering duties, ensure the description clearly relates to any or all of the PEO-defined engineering activities: planning, designing, composing, evaluating, advising, reporting, directing, supervising and/or the management of any of the above.)

- **3 pts** Developing
  - You include a limited description of your engineering or non-engineering duties, but lack a clear outline of how you will add your experience this term to your engineering résumé.

- **1 pt** Unacceptable or Missing
  - You do not describe how you will add your work experience this term to your engineering résumé.

#### Part A, Question 2a: Application of theory
- **Exemplary** 4 pts
  - You explain how you applied engineering fundamentals in analysis, design or synthesis, using
    - Structure (evidence of the what-how-why model)
    - Specific examples of what you did
    - Sufficient information about the complexity of the situation

- **3 pts** Developing
  - You explain how you applied engineering fundamentals in analysis, design or synthesis, but your explanation lacks or is unclear on two of the following:
    - Structure (evidence of the what-how-why model)
    - Specific examples of what you did
    - Sufficient information about the complexity of the situation.

- **1 pt** Unacceptable or Missing
  - You do not explain how you applied analysis, design or synthesis in your work experience this term.

#### Part A, Question 2b: First chosen prompt
- **Exemplary** 4 pts
  - You explain how you applied engineering fundamentals in one of the areas indicated in the assignment description, using
    - Structure (evidence of the what-how-why model)
    - Specific examples of what you did
    - Sufficient information about the complexity of the situation.

- **3 pts** Developing
  - You explain how you applied engineering fundamentals in one of the areas indicated in the assignment description, but your explanation lacks or is unclear on two of the following:
    - Structure (evidence of the what-how-why model)
    - Specific examples of what you did
    - Sufficient information about the complexity of the situation.

- **1 pt** Unacceptable or Missing
  - You do not explain how you applied analysis, design or synthesis in your work experience this term.

Note: Refer to Questions 2b-f for specific descriptions of each criteria.
### Part B: Looking Ahead (Reflection)

<table>
<thead>
<tr>
<th><strong>Part B:</strong></th>
<th>Exemplary</th>
<th>3 pts</th>
<th>Developing</th>
<th>2 pts</th>
<th>1 pt</th>
<th>Unacceptable or Missing</th>
<th>0 pts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gaps in knowledge and/or experience</strong></td>
<td>You identify several gaps in your knowledge and/or experience with sufficient detail, insight and evidence of reflection in your response.</td>
<td>You identify at least one gap in your knowledge and/or experience, but do not provide detail or evidence of reflection in your response.</td>
<td>You do not identify gaps in your knowledge and/or experience.</td>
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<tr>
<td><strong>Skills and abilities to focus on for development</strong></td>
<td>You identify several skills and abilities you want to focus on for development with sufficient detail, insight and evidence of reflection in your response.</td>
<td>You identify at least one skill or ability you want to focus on for development, but do not provide detail or evidence of reflection in your response.</td>
<td>You do not identify skills and/or abilities to focus on for development.</td>
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<tr>
<td><strong>Future job search/next co-op job</strong></td>
<td>You describe the kind of job you want for your next co-op job and in the future with sufficient detail, outlining the particular field, discipline, company and/or skills required.</td>
<td>You describe the kind of job you want for your next co-op job and/or in the future, but the description lacks detail pertaining to the particular field, discipline, company and/or skills required.</td>
<td>You do not describe the kind of job you want for your next co-op job or in the future.</td>
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<tr>
<td><strong>Quality of writing: Tone, spelling, grammar, and clarity</strong></td>
<td>Your tone is conversational but professional; your language is workplace-appropriate. Your writing is virtually free of spelling and/or grammar errors; existing errors do not detract from the reader's understanding.</td>
<td>Your tone is conversational but somewhat unprofessional OR your tone is too formal. Your writing includes some spelling and/or grammar errors; these errors do not detract from the reader's understanding.</td>
<td>Your tone is unprofessional and your language is inappropriate for the workplace. Your writing includes spelling and/or grammar errors that detract from the reader's understanding.</td>
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Total: 32 points