



Technology
Accreditation
Canada

Agrément en
Technologie du
Canada

National Technology Report Guideline

March 9, 2021

1. Guideline Purpose

The purpose of the National Technology Report Guideline is to support faculty and student compliance with National Accreditation Criteria E.2 General Learning Outcomes, GY01 Technology Report, and E.3 Technology Report.

2. Technology Report Purpose

The Technology Report is evidence a student has a clear understanding of an engineering technology or applied science program's academics.

The Report demonstrates a student's technical problem solving abilities and communication skills. Specifically, their ability to:

- identify and define a technical problem or issue.
- logically apply a technical methodology to attempt to solve the problem or address the issue.
- describe the results through the use of technology fundamentals, designs, data analysis and other appropriate techniques.
- draw and defend conclusions about the results.
- make recommendations, where applicable. While recommendations are not required, they are suggested as a way to demonstrate additional critical thinking about the problem and solution.
- present information and ideas in an integrated, cohesive document.

3. National Accreditation Criteria E.2 General Learning Outcomes, GY01 Technology Report

The Technology Report (TR) is one of the general learning outcomes (GY01) under National Accreditation Criteria E.2.

For National Accreditation Criteria E.2 to be assessed compliant;

the program must substantiate students have reliably demonstrated achievement of general learning outcome GY01 Technology Reports: **Research, design, test, analyze, conclude, present and defend a Technology Report relating to significant technology-related issue.**

A "learning outcome indicator" is measurable action, illustrating, defining and clarifying the level of student performance expected to achieve a learning outcome.

Learning Outcome Indicators include:

- 1.1 Determine a research area where practical technical investigation is warranted and define research goals and objectives.
- 1.2 Compile and integrate a range of research resources, including professionally published or peer reviewed literature, online tools, and interviews.
- 1.3 Integrate use of technologies to investigate procedures and analyze issues.
- 1.4 Assemble, analyze, and appropriately apply technical data to create graphics, reports, and other documents to support the Technology Report.
- 1.5 Integrate the processing, analysis, and interpretation of technical data to conclude the Technology Report.
- 1.6 Compile information effectively and accurately by analysing, translating, and producing the

Technology Report.

1.7 Justify conclusions and make recommendations, if applicable.

1.8 Create a Technology Report in a professional format using accepted principles documentation, grammar, writing style, graphics and design.

1.9 Present the Technology Report and respond effectively to questions defending project conclusions.

4. National Accreditation Criteria E.3 Technology Report

For National Accreditation Criteria E.3 to be assessed compliant, there must be a documented process for the Technology Report which includes when the report topic is selected, how the topic is selected, whether the report is written individually or as a group, the faculty support provided, the timing of progress reports/milestones and how and when the report is presented and the defended.

If the Technology Report is completed as a group, the program must substantiate each group member has reliably demonstrated achievement of general learning outcome GY01.

5. Marking Scheme

A detailed marking scheme, with student marks, for each author must be provided.

6. Group Authorship

A Technology Report prepared as a group will be accepted. The maximum number of group members is four (4).

7. Topic Selection

The topic of the Technology Report must be a significant technology related issue and related to the program in which the student is enrolled.

8. Original Concepts

A Technology Report which presents others' research, design, conclusions and recommendations is only acceptable if the student has enhanced the reviews with a significant contribution of their own work, which may include, but is not limited to, original research, design, analysis, processes, methods and/or discoveries.

9. Audience

When writing the report, a student should assume report readers may have both technical and non-technical backgrounds and should ensure the content is appropriate for each type of reader.

10. Technology Report Structure and Mechanics

The Technology Report must communicate information in a standard, comprehensible way following acceptable structure, style, formatting and language choices.

The body of the Technology Report, from the Introduction to the Recommendation(s), should contain at least 3,000 words, not including the Abstract, Bibliography (References) and Appendices.

The following components should be, included in the Technology Report:

1. Title Page
2. Executive Summary
3. Table of Contents
4. List of Illustrations
5. Introduction
6. Methodology
7. Results/Data/Analysis
8. Conclusions
9. Recommendations, if applicable
10. Bibliography (Technical References)
11. Appendices (where applicable)
12. List of Acronyms
13. Glossary of Terms

10.1 Title Page

The student's name and the date of submission. The title should identify the contents of the document. Three things to keep in mind when writing the title:

- It should not be longer than 10 words.
- It should be detailed enough so that the reader knows what to expect in the report.
- It should not contain any jargon, acronyms or other abbreviations.

Standard formatting for a title page places the title in the top third of the page, where the eye goes first. Additional information goes in the middle third of the page. The bottom third of the page is usually left blank. Page numbers, headers or footers are not usually placed on title pages.

10.2 Executive Summary

An Executive Summary presents the key points of the report. However, the purpose of the Executive Summary is to provide a decision-maker with enough information with which to make the required decisions. The Executive Summary should therefore start with your recommendations, with the rest of the key points positioned to support your recommendations.

10.3 Table of Contents

The table of contents lists the major topics and the related page numbers. Minor topics (lower level headings) are included as sub-topics under the appropriate major topic (highest level heading).

10.4 List of Illustrations

Illustrations/diagrams/charts should be technically correct.

10.5 Introduction

The purpose of the introduction is to provide readers with background information about the problem or issue. Students should start with general information and gradually become more specific.

In the introduction, each of the following questions should be answered:

- What is the background to the problem or issue?
- What is the problem or issue that which is being written about?
- What is the significance of the problem or issue which is being written about?

10.6 Methodology

The purpose of the methodology is to tell readers how the issue will be addressed or the problem solved. The methodology, which may include research, data collection, design, should be scientifically sound and the engineering technology or applied science principles should be appropriate to the subject area. This section answers the basic question 'What did you do?' This section has a very simple structure. It is organized chronologically in terms of what was done first, second, third, fourth and so on.

10.7 Analysis

The purpose of this section is to analyze the results, findings, design rationale, or data generated through the methodology.

In completing this section, any or all of the following analysis processes may be used:

- Comparing and contrasting.
- Indicating significance (what is important and what is not important).
- Indicating what is positive and negative.
- Indicating what was expected and what was surprising.
- Indicating what is related to the issue or problem and what is not.

Things to keep in mind when writing this section:

- Data and results should be accurate and complete.
- Mathematical formulae should be applied appropriately.
- Results lead to meaningful conclusions from the data whether it was determined from a design process, experiments, theories or secondary sources.
- Results should be summarized and the most significant ones illustrated.

10.8 Conclusions and Recommendations

Conclusions interpret the results, findings, final design, or data, from in the analysis section. Conclusions, and if applicable recommendations, should be logical and relate to and reflect the stated issue or problem.

Recommendations (if applicable) suggest a course of action and are provided when there are additional areas for study, or if the reason for the Technology Report was to determine the best action going forward.

Things to keep in mind when writing this section:

- Conclusions are reasoned judgment and fact, not opinion. Both conclusions and recommendations can be short statements.
- Conclusions consider all of the variables and relate cause and effect.
- Conclusions should be written as statements of fact.
- Recommendations should be written with an appropriate degree of confidence and certainty.
- Recommendations are not always required, depending upon the reason the report is being written.

10.9 Bibliography (Technical References)

A list of sources reviewed in the preparation of the report, listed alphabetically by author's last name. Any uses of the works of any other author, in any form (ideas, equations, figures, texts, tables, programs), must be properly acknowledged at the point of use.

10.10 Appendices

Appendices can include detailed calculations, tables, drawings, specifications and technical literature.

10.11 List of Acronyms

A list of acronyms may be incorporated in the event that there are many acronyms in the Technology Report, particularly for non-subject matter expert readers.

10.12 Glossary of Terms

This is a list of terms and words used in the report, arranged alphabetically.

11. Style and Language

In addition to a standard structure, each Technology Report should follow acceptable style and language usage including:

1. The document should be typed, double-spaced with recommended sans serif fonts, such as 11-point Calibri, 11-point Arial, and serif fonts such as 12-point Times New Roman, 11-point Georgia.
2. The lines should be justified left, with pages numbered and appropriate page breaks.
3. Correct spelling, punctuation and grammar should be used.
4. Consistent voice, subject-verb agreement and verb tenses should be used.
5. Jargon should be avoided if possible.
6. Acronyms should be explained.
7. References, footnotes, quotations and paraphrasing should be used correctly.

The APA (American Psychological Association) Guidelines are an excellent resource, apastyle.apa.org.

12. Best Practices

The following best practices are based on the audit of many Technology Reports and discussions with faculty who instruct the course in which the Technology Report is produced.

12.1 Faculty Support

Both technical support, often in the role of a “technical advisor”, and communication support, generally from the communication course instructor, provides students with an effective balance to produce a technically sound and well written Technology Report.

12.2 Proposal

While not mandatory, a Technology Report proposal may provide faculty an opportunity to help determine whether the proposed topic, problem and methodology will potentially result in a compliant Technology Report.

The Technology Report proposal should be approximately 500 words in length and should include:

- a) A Title Page with the following information:
 - Title: The title should be 10 words or less in length and should be specific. It should use standard terminology so that it is clear what the report is about.
 - From: The student’s name.
 - Program: The program in which the student is enrolled.
 - Date: The date of submission of the proposal.
- b) An introduction that includes a short background statement on why the topic was selected. The introduction should be approximately 100 words long.
- c) A body that includes a statement of the issue or problem which the Technology Report will attempt to address, the methodology with which this will be done and a hypothesis.
 - The problem statement should provide sufficient detail using specific engineering technology or applied science concepts, techniques, or processes to identify what is wrong. The problem statement should be an actual problem not summary or overview. The problem statement should be approximately 50 words long.
 - The methodology describes the approach the student will use to solve the problem. The methodology description should be about 300 words long.
 - The hypothesis states what the student thinks the solution to the problem is expected to be and why. The hypothesis should be strong and clear. It should not contain any words of uncertainty such as “maybe”, “probably”, or “might”. The hypothesis should be approximately 50 words long.

12.3 Topic

The topic of the Technology Report must be a significant technology-related issue. If the topic is selected by the student or is provided from industry, careful review of the topic is recommended as a poor topic can be the reason the Technology Report is assessed non-compliant.

Examples of technical problems that might be solved in a Technology Report include:

- design, redesign or restoration;
- testing and analysis;
- selection, development or improvement of a product, process or piece of equipment;
- improvement of efficiency or cost effectiveness;
- meeting a specific set of standards;
- investigation or assessment of a site.

12.4 Industry Involvement

While not mandatory, industry involvement can provide students with an enriched learning experience while preparing the Technology Report. Industry involvement may include;

- providing a business problem which could be a Report topic,
- acting as a “technical advisor” or mentor,
- attending the student presentation of the Report and asking questions as part of the student’s defense of their conclusions,
- evaluating the Report.

12.5 Progress Reports/Milestones

Just as a proposal can establish a good start, progress reports at various stages or the incorporation of milestones, including prior to the Report being submitted, with both technical and communication advisors, can ensure the Report has the required research, analysis and conclusions in a proper format with references and no spelling mistakes.

12.6 Evaluation

If the Technology Report is completed as a group, the program must substantiate each group member has reliably demonstrated achievement of general learning outcome GY01. While there is no prescribed method, following are a number of ways programs provide demonstrate each student has achieved general learning outcome GY01.

- a. Award individual marks for each student in the group,
- b. Allocate marks for peer review (i.e. students in a group assess each other),
- c. Faculty discussions with each group member throughout the report process to understand their contribution
- d. Presentations, with each group member presenting, throughout the report process.
- e. The presentation includes marks for defending the project’s conclusions.

Marks allocated, and shown in the marking scheme, for the presentation and defense of the conclusions in the Report provides clear evidence for auditors to evaluate these learning outcome indicators.

Few marks allocated for the Technology Report (i.e. the written report), within the overall course mark, may not motivate students to produce a report with the required elements.

Sample marking rubrics can be found on pages.

13. Sample Technology Report Titles

The Technology Report title should clearly indicate what problem or issues is in the report. The following are titles from technology reports submitted for the 2020 Technology Report Contest.

Building/Architectural

- Study to Improve the Student Housing Crisis in Galway, Ireland
- Rio Plaza – Multi-unit Commercial Building

Bioscience

- Comparison of Microbial Load in Water Using a Nanotechnology-Based Device (XYZ) Versus Heterotrophic Bacteria in Simulated Water-Cooling Tower System
- Antibacterial Activity of Essential Oils Against Human Pathogens

Biomedical

- Physiotherapy Arm Exoskeleton

Chemical

- Comparing Refrigeration Technology: Mechanical vs. MA3
- Bioethanol: Process Simulation for the Bioethanol Production
- Near-Infrared Calibration Expansion for Residual Hexanes in Degummed Canola Oil

Civil

- Application of Control Structures for Small-Scale Agricultural Drainage Projects
- An Investigation of the use of Fiberglass Reinforcing on Hollow Wood Beams

Computer

- Emergency Locator, An SOS GPS and Messenger Responder Device

Electrical

- Electrical Demand Analysis and Peak Reduction
- Designing and Implementing Visible Light Communication (VLC) System

Electronics

- Data Acquisition and Communication For Kintech Automated Therapy Devices
- Replica Medigun
- Cribbage for People with Reduced Vision
- The Innovative Laser Harp

Environmental

- Ultrafiltration as a Solution to Drinking Water Quality in Rural Nova Scotia
- Whitecap Dakota First Nation I.R. 94 Source Water Protection Plan

Geomatics

- EDM Measurements: Reflector vs Reflector-less with Various Materials/Colours

Instrumentation

- Toxic Gas Monitoring In Underground Mines

Mechanical

- Blade Assembly and Removal Systems Manufacturing
- Root Cause Failure Analysis for a Pressure Regulating Valve of a Wet Riser Fire Fighting System for North Oil Company
- Laser Delivery System (Mounting System)
- HVAC Improvements at Prince Edward Apartments Building in Uptown

Resources

- Invasive Plant Species Survey and Mapping in District of North Vancouver Parkland
- The Effect of Elevation on Vegetation Diversity on The Northernly Slopes of Mt. Benson
- Redesign of Mount Polley Mine's TSFTSF
- Comparison of Digital Vs. Ground Data Collection Techniques: Reliability for the Assessment of Forest Cover Attributes in Relation to Timber Volume
- Comparison of Completion Operations Between Seven Generations and Encana Corporation Within The Montney Formation

14. Sample Technology Reports

Sample reports can be found on the [2020 Technology Report Contest](#) page.

Acknowledgement

Sections of technology report guidelines from the provincial member associations of Technology Accreditation Canada, have been utilized to create this National Technology Report Guideline.

Technology Accreditation Canada acknowledges ABTTBC, ASET, OACETT and TPS for their generous support.

GROUP: C & M

PROJECT: Baseboard Heating

WORD COUNT: 4755 DATE: Dec 5/2018

MARKING RUBRIC - Assign. No. 8 Heating

FORMAL REPORT

English 273 - (ALL)

Submit (Do Not Staple) With Assignment

Unacceptable
20%Unsatisfact.
40%Satisfactory
60%Good Quality
80%-90%Excellent
90%-100%**FORMAT / DESIGN / READABILITY / APPEARANCE 10%**

2

4

6

8

10

- ☐ Document is visually attractive (impressive); uses full-block format (no indentation)
- ☐ Correct Document Format (all parts included in correct order): Title/Cover Page contains all information; Table of Contents/Figures is accurate; Front Matter is paginated correctly (either no pagination or Roman numerals); Body is paginated with Arabic numerals; Appendices are paginated (Arabic) and headed with upper case letters and title; headers present throughout
- ☐ Formatting is Consistent: font, case, tense, punctuation, headings, illustrations
- ☐ Readability: short paragraphs; 12-pt min font; appropriate layout/spacing; alignment of text; topic-driven use of headings, vertical lists, tables, charts, graphics

TRANSMITTAL DOCUMENT 5%

1

2

3

4

5

- ☐ Letter / Memo (not numbered): introduces report to recipient; may summarize or interpret report's main findings or concentrate on specific data and recommendations.
- ☐ Avoids introductory or announcement language

EXECUTIVE SUMMARY 10%

2

4

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8

10

- ☐ An abridged version of the whole report; written in non-technical terms, short and informative; may use vertical listings for clarity (one-tenth length of original - one page preferred)
- ☐ Not an introduction (no announcements or introductory language)
- ☐ Draws conclusions makes recommendations

INTRODUCTION / CONCEPT 5%

1

2

3

4

5

- ☐ Prepares reader for the discussion; indicates premise and scope of report
- ☐ Provides background information : interest, appeal, circumstances
- ☐ No announcements ("In this report I will ..."; "This is to inform you that...")
- ☐ No clichés; no redundant, dull opening phrases

- lots of pr. one after sentences.

DISCUSSION / DETAILS 25%

5

10

15

20

25

- ☐ Data, facts, details are well organized into short paragraphs (readable gulps)
- ☐ Information (data) is complete, relevant, and accurate
- ☐ Graphics are appropriately used if applicable to your topic (tables, charts, graphs, pictures)
- ☐ Text refers to illustrations in your report; document is within required word maximum

CONCLUDING SEQUENCE 5%

1

2

3

4

5

- ☐ Outcome: results, success, follow-up action, recommendations
- ☐ No new material
- ☐ Ends with a personalized, natural, and friendly statement
- ☐ No clichés; no redundant, dull closing phrases

DOCUMENTATION 5%

1

2

3

4

5

- ☐ Citation Style: uses quality and credible sources; integrates quotes (paraphrases, summaries) grammatically and logically into text to make points; uses only reference material that strengthens argument or information; limits number of citations to support your points.
- ☐ Cites Sources (including pictures) using correct in-text citation formatting (period after brackets) e.g. [1], or (Author year, pp).
- ☐ Includes correctly-formatted Reference List

APPENDICES / ATTACHMENTS / GRAPHICS 10%

2

4

6

8

10

- ☐ Appendices (tables, charts, illustrations, pictures, sketches, layouts, calculations) should all be upper-case lettered, titled, and paginated (continues Arabic numbering from the body of report)
- ☐ Graphics: (tables, charts, illustrations, pictures, sketches, layouts, calculations) are visually attractive (impressive); designed for clarity and readability
- ☐ Graphics are designed, sized, and positioned to integrate well into the report; simple and uncluttered and depict data clearly and efficiently (shading is clear and distinct)
- ☐ Graphics includes interpretive data (tables) and captions (charts and pictures)
- ☐ Labelling is correct and complete (table title above; chart/picture title below); includes captions

STYLE / EXPRESSION / TONE 15%

3

6

9

12

15

- ☐ Diction and Idiom (appropriate): precise and sophisticated use of language
- ☐ Precision (appropriate/creative vocab): no wordiness, ambiguity, redundancy, awkwardness, wrong / missed words, vagueness, nonsensical wording; Transitions: for smooth and logical flow
- ☐ Symmetry: in number, tense, and person; in formatting (headings, lists, fonts)
- ☐ Parallelism: in language; in vertical lists
- ☐ Creative Language: shows originality; avoids clichés, jargon, LIC words
- ☐ Active Voice: sentences have a "doer" of action (in a subject/object sequence)
- ☐ Tone: reader or "you-centred" text; no sarcasm, negativism

- Transitions
- pr**GRAMMAR / MECHANICS 10%**

2

4

6

8

10

- ☐ Major Sentence Errors (fragment, run-on, comma splice): -4% or -8%
- ☐ Other Major Errors (agreement subj/vb, pro/ant; tense; other): -2% or -4%
- ☐ Minor Errors (spelling, articles, numbers, other): -1% or -2%
- ☐ Punctuation (, , : , -) : -5% or -1% Caps: -5% or -1%
- ☐ Vertical List Punctuation/Caps: -1% Caps for Titles/Headings: -1%
- ☐ Italics for Titles of Software and Printed Works: -1%

Circled criteria above indicate omission or need for improvement

MARK (%) =

92

Sections can go into negative totals

COMMENTS: Avoid always starting sentences with articles, it gets together
- excellent discussion and formatting

MARKING RUBRICS - PRESENTATIONS

Total Est. Time → 15 min

<p>Marking Key</p> <p>NEEDS IMPROVEMENT - My comments will note specific ways to improve in this area. (C, C+)</p> <p>OKAY - Improvement was possible in this area (B-, B, B+); circled items indicate areas needing improvement.</p> <p>GOOD - This is the default evaluation (A-); you have met presentation expectations in this area.</p> <p>EXCELLENT - You have exceeded presentation expectations (A, A+).</p>	<p>12:50:49 (510 sec)</p> <p>GROUP NAME: C & M</p>
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PRESENTATIONS (Practice, Proposal, Progress 1, Progress 2, Final)		Presenter: [REDACTED]	Actual Time: 6:46 - give or take 5 sec..
<p>Preparation/Structure/Content (<i>Rehearsed, Coherent</i>)</p> <p>Room Preparation (Light level, Furniture, Equipment, People)</p> <p>Introduction, Body, Conclusion, Transitions (Content and Speaker)</p> <p>because there isn't a full horse you might consider asking all audience members to sit on one side.</p>	<p>Comments:</p> <p>Excellent transitions! You are well prepared!</p> <p>- lighting? you might want to have front row turned down</p>		
<p>Media / Visuals (<i>Smooth, Visible, Un-busy</i>)</p> <p>Slides (Uncluttered) - Slides are not too busy and use minimum 24 pt. font; graphics enhance discussion and are incorporated effectively.</p> <p>Familiarity with Equipment (Hardware)/Slides (Transitions) - Rehearsed?</p> <p>- excellent use of your own photos</p>	<p>Comments:</p> <p>love the circle animations.</p> <p>- excellent use of humour</p> <p>* transitions to add information to your slides.</p> <p>- clear & understandable great mix of technical & non-technical</p>		
<p>Poise / Distractions (<i>Appearance, Language, Movements</i>)</p> <p>Presentation Style (Engaging / Conversational) - Use cues from slides or from hard copy; DON'T READ; you are confident, prepared, and poised.</p> <p>Voice: not monotonous or disinterested; voice is audible, well-modulated, well-enunciated; pace is fluid and uninterrupted.</p> <p>Eye Contact - Face the audience squarely; engage the entire audience, not just one side; DON'T LOOK AT THE SCREEN.</p> <p>Grammar- Use standard, simple, clear vocabulary - no colloquialisms, clichés, or repetitive, annoying empty words (um, like, well, so, yeah, ya know).</p> <p>lovely closing comment</p>	<p>Comments:</p> <p>- incredibly well prepared!</p> <p>(b)</p> <p>you still run a bit fast</p> <p>- you are incred. b</p> <p>- you speak clearly & well. It is clear you know your project well!</p>		

PRESENTATIONS (Practice, Proposal, Progress 1, Progress 2, Final)		Presenter: [REDACTED]	Actual Time: 5:07:68
<p>Preparation/Structure/Content (<i>Rehearsed, Coherent</i>)</p> <p>Room Preparation (Light level, Furniture, Equipment, People)</p> <p>Introduction, Body, Conclusion, Transitions (Content and Speaker)</p>	<p>Comments:</p> <p>- work on transitions between topics in your half of presentation</p>		
<p>Media / Visuals (<i>Smooth, Visible, Un-busy</i>)</p> <p>Slides (Uncluttered) - Slides are not too busy and use minimum 24 pt. font; graphics enhance discussion and are incorporated effectively.</p> <p>Familiarity with Equipment (Hardware)/Slides (Transitions) - Rehearsed?</p>	<p>Comments:</p> <p>- great animations for "App Screen Slide"</p> <p>- label graphics.</p> <p>- text to match / further indicate what is important to show in graphics</p>		
<p>Poise / Distractions (<i>Appearance, Language, Movements</i>)</p> <p>Presentation Style (Engaging / Conversational) - Use cues from slides or from hard copy; DON'T READ; you are confident, prepared, and poised.</p> <p>Voice: not monotonous or disinterested; voice is audible, well-modulated, well-enunciated; pace is fluid and uninterrupted.</p> <p>Eye Contact - Face the audience squarely; engage the entire audience, not just one side; DON'T LOOK AT THE SCREEN.</p> <p>Grammar- Use standard, simple, clear vocabulary - no colloquialisms, clichés, or repetitive, annoying empty words (um, like, well, so, yeah, ya know).</p>	<p>Comments:</p> <p>- slow your pace just a bit</p> <p>- you have a nice, calm, centered approach to presentations.</p> <p>- "seeing as how" a bit wordy</p>		

A+