



TECHNOLOGY REPORT GUIDELINES

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Technology Report Guidelines

1. Introduction

The Technology Report (TR) is a certification requirement by the Institute of Engineering Technology of Ontario (IETO), the certification division of OACETT, to achieve the Certified Engineering Technologist (C.E.T.) designation.

The purpose of the Technology Report is to demonstrate the candidate's technical problem-solving abilities, specifically their abilities to:

- Identify and define a technical problem.
- Describe the problem accurately and in detail.
- Logically apply a technical methodology to attempt to solve the problem.
- Describe the results through the use of technology fundamentals, designs, data analysis and other appropriate techniques.
- Draw conclusions about the results.
- Make recommendations if applicable. While recommendations are not required, they are suggested as a way to demonstrate additional critical thinking about the problem and solution.

The Technology Report must demonstrate a level of engineering technology or applied science knowledge and application equal to that required of an Engineering Technologist. Candidates who are missing technologist level academics must complete any outstanding requirements first. The Technology Report does not need to have original concepts. However, the candidate must demonstrate the application of current concepts to a unique context or situation. The candidate must also demonstrate the ability to present information and ideas in an integrated, cohesive document.

2. Topic Selection

The topic of the Technology Report should be within the discipline of engineering technology or applied science of the candidate's academic background and for which the candidate is applying for certification. The candidate should not select a topic unless the candidate has either sufficient interest to learn the area in detail or has sufficient experience in the area to deal with it at more than an elementary level. The Technology Report should include in depth discussion and supporting analysis based on the candidate's academic background and

experience gained in the workplace. The discussion and analysis should be beyond what is available in college and university level textbooks.

A topic not within the candidate's academic discipline, but in another engineering technology or applied science discipline, may be considered if the candidate's experience has migrated into this new discipline. The topic must be at the same level expected from someone trained in that discipline. If the topic is not within an engineering technology or applied science area, or is not one in which C.E.T.s normally participate at a responsible level, it may be considered if the candidate's experience has migrated into this area. In this situation, the candidate must demonstrate strong interest in the topic and must be able to discuss the topic in depth.

3. Declaration of Authorship

Sole Authorship

The Technology Report must be the candidate's own work and a signed declaration confirming that this is the case must be included as a separate page in the report. If the candidate has a college report prepared as part of a group project, refer to Group Authorship below.

A signed Declaration of Sole Authorship stating the Technology Report is the candidate's own work should be worded as follows:

I, _____, confirm that this work submitted for assessment is my own and is expressed in my own words. Any uses made within it of the works of any other author, in any form (ideas, equations, figures, texts, tables, programs), are properly acknowledged at the point of use. A list of the references used is included.

All sources of information must be acknowledged in the Technology Report. Plagiarism is unethical. A candidate suspected of plagiarizing may be referred to the Complaints Committee.

Group Authorship

A Technology Report prepared as a group activity will not normally be considered; however, a recent, **less than five years old, undergraduate final-year report, prepared as a requirement of an engineering technology or applied science program of studies**, will be considered if all other requirements are met except actual work experience at the time the report was prepared. In this case, at the proposal stage, the candidate must clearly indicate:

- which parts of the overall Technology Report he or she completed and which were completed by other members of the group using percentage breakdown of each and # of pages and how that relates to the number of pages in the report:

- EXAMPLE

- Total Report length is 20 pages
- Methodology Section is 5 pages and Student A wrote 25% and Student B wrote 25% and Submitting Member wrote 50% which is 2.5 pages for the member submitting the TR
- Recommendations is 4 pages and Student A wrote 50% and Submitting Member wrote 50% which is 2 pages for the member submitting the TR

- the college and program name for which the report was completed and the date of submission to the college.

A Declaration of Group Authorship with this breakdown (% and number of pages) must be included as a separate page in both the proposal and the report instead of the Declaration of Sole Authorship, worded as follows:

I, _____, confirm that this breakdown of authorship represents my contribution to the work submitted for assessment and my contribution is my own work and is expressed in my own words. Any uses made within the Technology Report of the works of any other author, separate to the work group, in any form (ideas, equations, figures, texts, tables, programs), are properly acknowledged at the point of use. A list of the references used is included.

All sources of information must be acknowledged in the Technology Report. Plagiarism is unethical. A candidate suspected of plagiarizing may be referred to the Complaints Committee.

4. The Technology Report Preparation and Submission Process

Two-Step Process

Successful completion of the Technology Report involves two separate steps, which must be followed in order.

1. Candidates submit a Technology Report Proposal as a PDF or WORD document attachment to OACETT via e-mail to certify@oacett.org. This proposal must be received and approved before the candidate proceeds to the second step. Guidelines for the Technology Report Proposal are provided below. If the proposal is for a college technology report completed as part of a group project, it must include the required information and detailed breakdown described in Section 3: Group Authorship.
2. Candidates complete their Technology Report and submit as a PDF or WORD document attachment to OACETT via e-mail to certify@oacett.org.

5. The Technology Report Proposal

The Technology Report Proposal informs the IETO Admissions Committee of the candidate's intent to submit a Technology Report. It gives the Committee an opportunity to determine whether the proposed topic, problem and methodology will potentially result in an acceptable Technology Report. **The candidate must receive approval on the Technology Report Proposal before proceeding to the Technology Report.**

The Technology Report Proposal should be approximately 500 words in length. The Technology Report Proposal should contain:

1. A Title Page with the following information:
 - i. Title: The title should be 10 words or less in length, but should be specific and detailed. It should use standard terminology so that it is clear what the report is about.
 - ii. From: The candidate's name, membership number and address.
 - iii. Discipline: The discipline in which the candidate is seeking certification.
 - iv. Date: The date of submission of the proposal.
2. An Introduction that includes a short background statement of what the proposal covers and why this particular topic and problem are being tackled. The introduction should be approximately 100 words long.
3. A Body that includes a statement of the problem which the Technology Report will attempt to address, the methodology with which this will be done and a hypothesis.
 - i. 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. Proposals that are summaries of an industry or situation that do not try to solve a problem will not be approved. The problem statement should be approximately 50 words long.
 - ii. The methodology describes the approach the candidate will use to solve the problem. The methodology description should be about 300 words long.
 - iii. The hypothesis that states what the candidate 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.

The TR Proposal will be evaluated using the following checklist.

1. Does it appear that the report will be in an area which will be acceptable for this candidate?
2. Is the report within the candidate's discipline? If not, will it be acceptable because of extenuating circumstances?
3. Does the introduction provide a statement of what the proposal covers, giving a short background explanation of why this particular report is being prepared (other than to meet OACETT's Technology Report requirement)?
4. Does the body of the report outline the problem, content, and methodology?
5. Does it include technology fundamentals, designs, experiments, processes, improvements, solutions and/or data analysis?
6. Is there an acceptable hypothesis statement that describes what the solution to the problem is expected to be?

Timeline - The results of the Technology Report Proposal evaluation will be communicated via e-mail 6 to 8 weeks after submission to OACETT.

6. The Technology Report

Once the Technology Report Proposal has been approved, candidates can start work on the actual Technology Report. The Technology Report must be submitted within one year of the approval of the Technology Report Proposal.

The Technology Report will be evaluated in two areas: Report Structure and Mechanics, and Technology Content Quality. Each area must be acceptable in order for a candidate to achieve a final grade of "Satisfactory" on the Technology Report.

7. The 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 following components should be included in the Technology Report:

1. Title Page including the Title, the candidate's name, current OACETT designation (if any), membership number and the date of submission.
2. Declaration of Authorship
3. Copy of the approved proposal and the approval email from OACETT

4. Abstract (or Executive Summary, not both) which is a brief summary (approximately 75 to 100 words) of the report's introduction, problem statement, methodology, hypothesis, results, conclusion(s), and if applicable, recommendation(s).
5. Table of Contents
6. List of Illustrations
7. Introduction which answers the following questions:
 - a. What is the industry or organization or context?
 - b. What is included and/or omitted? What is the scope of the report and what procedures are used?
 - c. Why was the work described in the Technology Report undertaken?
 - d. What is the problem?
8. Methodology which outlines the steps taken to solve the problem.
9. Results/Data/Analysis which includes diagrams, charts, tables and other visual information as appropriate.
10. Conclusion(s) which interpret(s) the data found in the results section. Conclusions are reasoned judgment and fact, not opinion. Conclusions consider all of the variables and relate cause and effect. Conclusions analyze, evaluate, and make comparisons and contrasts.
11. Recommendation(s) (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.
12. Bibliography (Technical References)
13. Appendices can include detailed calculations, tables, drawings, specifications, and technical literature.

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 using Arial, Univers, or a similar Sans Serif 12-point font.
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 body of the Technology Report, from the Introduction to the Recommendation(s), must contain at least 3000 words not including the Abstract, Bibliography (References) and Appendices.

8. Technology Report Content Quality

The Technology Report should be a logical, methodical investigation into an engineering technology or applied science problem. Candidates should provide details of what was done in the study including what materials, equipment and procedures were used and why they were selected over other alternatives. If relevant, candidates should provide drawings, photographs and diagrams to support their work visually. Calculations should also be included if relevant. Additional calculations and references can be included in the Appendices rather than the Body of the report.

When writing the report, candidates should assume their readers are from the same engineering technology or applied science discipline but may not necessarily be from the same specific area within that discipline.

Candidates should keep the following criteria in mind as they write their Technology Report:

- The methodology should be scientifically sound and the engineering technology principles should be appropriate to the subject area.
- The data and results should be accurate and complete. They should follow sound scientific and engineering technology principles. Results lead to meaningful conclusions from the data whether it was determined from experiments, theories or secondary sources.
- The mathematical formulae should be applied appropriately.
- The illustrations/diagrams/charts should be technically correct.
- The analysis should be complete.
- Candidates should summarize the results and illustrate the most significant ones.
- The Conclusion(s), and if applicable the Recommendation(s), should be logical and relate to and reflect the Problem Statement.

9. Sample Technology Report Titles

A Technology Report should relate to the discipline in which the candidate wants certification. It should describe an engineering technology or applied science problem and how it was solved. The Technology Report title should clearly indicate what problem is being solved in the report.

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; and investigation or assessment of a site.

The following are sample titles from actual Technology Reports in different disciplines:

Building/Architectural

- Standardized Shear Testing of Structural Panels with Blocking
- Investigation of Mold Amplification within an Institutional Building
- Laboratory Assessment of Roller-Compacted Concrete
- Restoration of Concrete Structures Damaged by Corrosion of Reinforcing Steel
- Cost and Schedule Control for Daycare Renovations Where Asbestos Identified

Chemical

- Effects of Filler Concentration and Shear Rate on Filled Polymer Compound Viscosity
- Determining Heavy Water Properties in Nuclear Reactor Computer Blowdown Code
- Analysis of Ethyl Carbonate in Wine

Electronics

- Developing Three Position Elevator Model with Soft Start and Soft Stop
- Designing Continuous Online Catalyst Loading
- Audio Spectrum Analyzer Design
- Implementing Subcarrier Multiplexing on Fiber Optic Networks
- Evaluating Gas Monitoring Measurement Techniques

Civil

- Traffic Calming: An Evaluation of Tools and Policies for Ontario
- Lake Oxygen Restoration Project

- Fuel Oil Tank Decommissioning and Impacted Soil Removal
- The Design and Analysis of a Retaining Wall on an Irregular Slope

Environmental

- An Environmental Health Assessment of Grenadier Pond
- Laboratory Analysis Utilizing an Atomic Absorption Spectrometer
- Quantifying Stormwater Pollutant Reduction Benefits of Public Works Maintenance Practices

Mechanical

- Design and Development of Coat Hook Assembly for Automotive Interior Application
- How to Manufacture More Effectively Using Laser Technology
- Improving Indoor Air Quality in a Residential Application

10. Technology Report Evaluation

Technology Reports are evaluated using three checklists: The Prescreening Checklist, the Report Mechanics and Structure Checklist, and the Report Content Checklist. In order to achieve a “Satisfactory” result on the Technology Report, candidates must achieve 100% on the Prescreening Checklist, 60% on the Report Mechanics and Structure Checklist, and 60% on the Report Content Checklist.

Prescreening Checklist

1. Has a Proposal for a Technology Report been submitted and accepted and a copy of the approved proposal included in the Technology Report?
2. Has the Technology Report been submitted within one year since the proposal was approved?
3. Is the Technology Report consistent with the Proposal (as approved and with the comments and suggestions made by the proposal reviewer)?
4. Is the Technology Report typed, double-spaced and justified left?
5. Has a 12 point Arial, Univers, or similar Sans Serif font been used?

6. Is the body of the report a minimum of 3,000 words?
7. Are the components included and in the following order: Title Page; Declaration of Authorship; Approved Proposal; Abstract/Executive Summary; Table of Contents; Lists of Illustrations/Diagrams; Body of the TR; Conclusion(s), and if applicable Recommendation(s); Bibliography/Technical References; and Appendices?
8. Is there a signed Declaration of Authorship?
9. Is the report dated?
10. Is the Technology Report current? (The Technology Report should be less than 5 years old.)
11. Is there a Title Page?
12. Is there a Table of Contents?
13. Does the Table of Contents correctly reflect the Components: Headings, Illustrations/Diagrams and Appendices?
14. Are the pages numbered with appropriate page breaks?
15. Is there an Abstract/Executive Summary and Introduction?
16. Does the body of the report contain Section Headings?
17. Are there Conclusion(s), and if applicable, Recommendation(s)?
18. Is there a Bibliography with appropriately cited Technical References?

Report Mechanics and Structure Checklist

This section evaluates the structure, formatting and writing techniques used in the TR. Fulfillment of this criteria leads to a TR that looks professional, is easy to read and is representative of the formatting standards of the industry.

1. Does the Title, in ten words or less, inform readers of the precise subject matter contained in the TR?

A title should be concise and include key words for indexing.
2. Does the Abstract or Executive Summary provide a brief overview of the report in approximately 75 to 100 words?

3. Does the Abstract or Executive Summary summarize the Conclusion(s), and if applicable, the Recommendation(s)?
4. Does the Introduction state the reason the work was undertaken? What is the industry, organization or context? What is the problem?
5. Does the Introduction cover the scope of the report? What is included and /or admitted, and what procedures are used?
6. Do the headings and subheadings in the Body adequately and accurately describe the section or subsection content?
7. Does the Body include information regarding the methodology?

Does it indicate materials, equipment and procedures used and why they were selected over alternatives? Is there sufficient detail so that the methodology can be duplicated by others?

8. Does the Body include recent research findings?
9. Does the Body include results/data from the study?
10. Are illustrations, tables, diagrams and charts clearly drawn, labelled and numbered?
11. Is each Conclusion, and if applicable, each Recommendation, stated in a separate paragraph and in a positive way?

Conclusions should not be qualified with “it seems”, “probably”, “it may be”, or other words that dilute the strength of the conclusion.

12. Are the References/Bibliography complete?

All materials referenced in the TR should be represented in the list of References/Bibliography.

13. Do the Appendices support the study?

Do the Appendices include substantiating data and calculations? Extraneous material should not be included.

14. Is the spelling correct?

Has either the Canadian or USA spelling system been used consistently through the TR.

15. Is the language free of jargon?

Are acronyms properly introduced? Are abbreviations appropriate and correct? Can someone without specific expertise in the field read and understand the TR?

16. Is the same voice (I, one, person, etc.) used consistently throughout the Technology Report?

There should not be any switching from third person to first person or vice versa.

17. Do the grammar and punctuation follow normally accepted rules of use?

Use Ron Blicq's text Technically Write or a similar grammar reference as a guide.

18. Are thoughts and illustrations/diagrams/charts that do not belong to the writer properly identified and footnoted in the text?

Are quotations indicated correctly? Are the authors referenced in footnotes and/or reference list? Do they include the author's name, the title of the article/book, the date of publication, and the publisher?

Report Content

This section evaluates the quality of the work completed when addressing the problem statement/hypothesis. Fulfillment of these criteria leads to a TR that makes a contribution to the field under study.

1. Are the Problem Statement and Hypothesis significant to the current state of the field/industry?
2. Is the Methodology scientifically sound?
3. Are the engineering technology and applied science principles used in the Methodology and Analysis appropriate to the subject area?
4. Are the Data and/or Results complete?
5. Have the Mathematical formulae been applied appropriately?
6. Are the Mathematical calculations done correctly and accurately?
7. Are the Illustrations/Diagrams/Charts technically correct?
8. Is the Analysis of the results correct?

9. Is the Analysis complete?
10. Are the Conclusion(s), and if applicable the Recommendation(s), free of discussion, explanation and opinion?
11. Do the Conclusion(s), and if applicable the Recommendation(s), relate to and resolve the Problem Statement and/or Hypothesis?
12. Are the Conclusion(s), and if applicable the Recommendation(s), logical?
13. Does the report make a contribution to the industry/field of study?

Timeline - The results of the Technology Report evaluation will be communicated via e-mail 8 to 10 weeks after submission to OACETT.

If the candidate receives the required scores for each section, the Technology Report will receive a grade of "Satisfactory". If the candidate does not receive the required scores for each section, the Technology Report will receive a grade of "Unsatisfactory". All unsatisfactory reports are automatically reviewed by an additional evaluator prior to the candidate being informed of the results of the evaluation. If the grade is "Unsatisfactory", the Reviewers will provide comments to assist with rewriting the Technology Report. An "Unsatisfactory" Technology Report may be resubmitted only once and only after appropriate revisions have been made. This resubmission must be done within three (3) months of the notification date of the results. If, after revisions, the Technology Report still does not meet the OACETT standard, a new topic must be chosen and a new Proposal for a Technology Report submitted.

11. Ownership and Confidentiality of the Technology Report

The Technology Report will remain the property of OACETT and may be used as samples to assist other candidates in the preparation of their Technology Reports. Technology Reports are safely disposed of after one year.

An OACETT member may wish to submit a Technology Report prepared on behalf of an employer or a client which is proprietary to that employer or client. Special arrangements can be made with the Registrar for confidential or proprietary Technology Reports, provided a written request is made in advance. OACETT will issue a standard, signed, confidentiality agreement for such requests. The Technology Report will not become the property of OACETT and all copies will then be returned to the OACETT member upon completion of the evaluation. Candidates must obtain their employer's or client's written permission prior to submitting the Technology Report to OACETT.

12. Technology Report Writing Seminar - OPTIONAL

OACETT offers a Technology Report Writing Seminar to assist candidates in preparing for and completing their Technology Report. The seminar is offered on a continuous basis in an online format and several times a year in a classroom-based format. For information on the Technology Report Writing Seminar and how to register, please see the OACETT website at www.oacett.org/Membership/Technology-Report-and-Seminar/TR-Seminar.

13. Resources

The following references may be useful in the preparation of a Technology Report:

Blicq, R. S. and Moretto, Lisa. (2011). *Technically Write, Eighth Canadian Edition*. Toronto: Pearson Canada ISBN-13: 978-0132158855.

Rubens, P. (2000). *Science and Technical Writing: A Manual of Style, 2nd Edition*. New York: Routledge ISBN-13: 978-0415925518