



SASKATCHEWAN APPLIED SCIENCE TECHNOLOGISTS AND TECHNICIANS (SASTT)

Guidelines for Preparation and Evaluation of the Applied Science Technology Research Project / Technology Report

PURPOSE OF THE APPLIED SCIENCE TECHNOLOGY RESEARCH PROJECT / TECHNOLOGY REPORT

The Applied Science Technology Research Project / Technology Report is referred to as the “Technology Report” throughout this document. The Saskatchewan Applied Science Technologists and Technicians (SASTT) requires an applicant technology report for registration as a professional technologist. Industry and employers recognize the professional technologist by the use of the designation A.Sc.T., Applied Science Technologist.

Competence in the practice of applied science theory and basic engineering principles at the technologist level will be demonstrated in the technology report. Elements of design, development and application of theory with extensive technical and mathematical depth must be included. Professional composition and communication skills are expected. Sole authorship of the technology report will be certified by the applicant. Where the report is a collaboration of work by others the author will clearly indicate his or her contribution.

The technology report will be evidence that the applicant has a clear understanding and mastery of the discipline’s academics. Discipline ability and competence of the applicant not only to write a technology report but the capacity to apply, to develop and to evaluate applied science technology theory and basic engineering principles will be proven by the technology report. This bears a direct relationship to the degree of applied science and basic engineering competence, mathematical skill, and report writing expertise expected of a professional technologist in industry.

The technology report is one process by which SASTT monitors the academics of their future members. It is the evidence and process by which the competence and skills of the profession are maintained. It is a process which will protect the public and enhance the applied science technology profession by ensuring the academics are continually evaluated.

HISTORY OF THE APPLIED SCIENCE TECHNOLOGY RESEARCH PROJECT / TECHNOLOGY REPORT

The technology report has been in existence in Saskatchewan before “national accreditation”. SASTT has always recognized the importance of this competence indicator as a requirement for registering technologists as professional Applied Science Technologists, A.Sc.T.

This document defines the content, process and requirement of the technology report. It is the statement of years of refinement and application of the technology report for the purpose of SASTT registration of professional technologists.

APPLICANT REGISTRATION / CERTIFICATION AND PROGRAM ACCREDITATION

Applied science and engineering technology programs across Canada have made use of various accreditation standards. The most recent standards used to accredit programs are the Canadian Technology Accreditation Criteria (CTAC). **It must be stressed that these program accreditation standards represent the academic requirements for SASTT registration.**

GY01 – Technology Report is a requirement for both program accreditation and registration as a technology professional, A.Sc.T.

The following is copied from the web at:

http://www.technologyaccreditation.ca/National-Accreditation/National_Accreditation_Standards_-_CTAC

CANADIAN TECHNOLOGY ACCREDITATION CRITERIA (CTAC)

Excerpt from the 2016 Canadian Technology Accreditation Criteria (CTAC) – Program General Learning Outcomes (PGLO), Common to All Technologist Disciplines - GY01 – Technology Report (Capstone Project)

Program General Learning Outcomes (PGLO)

GY01 Technology Report (Capstone Project)

Research, design, test, analyze, conclude, and defend a Technology Report (Capstone Project) relating to a significant technology-related issue.

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 wide 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 analyzing, translating, and producing the Technology Report.
- 1.7 Justify conclusions and make recommendations.
- 1.8 Create the Technology Report in professional format using accepted principles of documentation, grammar, writing style, graphics and design.
- 1.9 Present the Technology Report and respond effectively to questions defending project conclusions.

REQUIREMENTS OF THE APPLIED SCIENCE TECHNOLOGY RESEARCH PROJECT / TECHNOLOGY REPORT

1. The technology report must examine an applied science technology issue and demonstrate:
 - Critical analysis of a technical issue. This is a technical thought pattern leading from the identification of an issue to the creation of a hypothesis, its analysis, development, design, evaluation and ultimately a conclusion with recommendations.
 - Analysis of a technical issue; development and design of alternate solutions where applicable; analysis and evaluation of how the recommendations derived.
 - Where applicable; economics, time, resource, environmental, personnel, safety, professional and management issues must be evaluated.
 - A conclusion with recommendations.
 - Acknowledgement of sources through bibliography, references and foot notes. Acknowledgement of sources not only indicates intellectual courtesy and honesty, it also enables the examiner to confirm references material.
2. The technology report body will have no less than 3,000 and no more than 6,000 words excluding the synopsis, letter

of request, table of contents, references, bibliography, and appendix.

3. The applicant will provide SASTT a letter of proposal, (request) with a synopsis on the topic of the technology report. SASTT will confirm if the topic will provide sufficient technical depth for success of the technology report.
4. The completed technology report must be submitted within one year of SASTT approval of the topic.
5. The technology report will utilize technologist level mathematics, computer applications, applied science theory and basic engineering fundamentals appropriate to the topic and discipline of the applicant.
6. The technology report will utilize applied science technology theory and basic engineering principles through the application of the elements of analysis, design, and evaluation. Where relevant to the topic; cost, project management, alternatives and environmental impact will be included.
7. This document provides guidelines for the content and format for the **APPLIED SCIENCE TECHNOLOGY RESEARCH PROJECT / TECHNOLOGY REPORT**.

ACADEMICS, COMPETENCY AND LEVEL OF PRACTICE

The technology report is expected to demonstrate the application of composition and communication skills to design a professional, industry standard technology report. Competence of the applicant to apply the knowledge of applied science theory, basic engineering principles and advanced mathematics acquired from academic studies and/or work experience will be demonstrated. This bears a direct relationship to the expected degree of technical knowledge, mathematical skill, and report writing expertise in the technology report.

Academic competency and level of practice as detailed in the professional applied science technologist profile below, will be demonstrated by the applicant's technology report.

Professional Applied Science Technologist Profile

A professional applied science technologist, through academic training and experience in the application of applied science theory, basic engineering and scientific principles, will practice applied science technology.

The professional applied science technologist, in the practice of applied science technology, can perform a wide range of complex work. Activities which include design, development, production, marketing, testing, quality control, estimating, surveying, inspection, diagnostic evaluation, supervision, management, technical sales and teaching. Such activities may be carried out in association with other professionals.

The professional applied science technologist will apply scientific, mathematical, basic engineering and technology theory in the practice of applied science technology.

The professional applied science technologist can design, develop, implement, evaluate and certify assignments; design, develop, implement, evaluate and certify procedures and processes; design, develop, implement, evaluate and certify solutions; design, develop, implement, evaluate and certify work to meet objectives; design, develop, implement, evaluate and certify short and long range planning, and can design, develop, implement, evaluate and certify conceptual change.

The professional applied science technologist can supervise, manage and co-ordinate a diverse working group. They can train technical and professional staff.

The professional applied science technologist can analyze, design, develop, evaluate, manage, administrate and certify a wide range of industrial enterprises through the application of accepted and proven scientific and applied science theory, processes and procedures.

APPLIED SCIENCE TECHNOLOGY RESEARCH PROJECT / TECHNOLOGY REPORT SUBJECT MATTER

1. The topic of the technology report must relate to the discipline in which registration is sought. Topics for the technology report will be as diverse as the disciplines of SASTT and cannot be addressed in this document. However, generally, the topic maybe the development of a process, concept, product or issue related to the applicant's discipline. The project

report maybe based on an applied science topic related to the applicant's current employment.

The technology report must demonstrate applied science technology competence at the technologist level. This is expressed by the application of the elements of analysis, design and evaluation of scientific, applied science and basic engineering theory with extensive technical and mathematical depth. This will prove the author's understanding and mastery of the discipline academics.

2. Technology reports usually fall into one of three general categories.

Source Report: This is the most difficult report. It requires the applicant to perform in-depth compilation and analysis of information from many sources on a single topic. The author must dissect these many sources and develop a consensus relevant to the project report topic. All the while the author must address application, analysis, design and evaluation processes relative the discipline. The source report requires an extensive search of all sources of material related to the subject (libraries, manufacturing specification sheets, literature and brochures, etc.). The report may entail considerable correspondence with government agencies as well as industry sources where applicable.

An example of a source report would be a study of recent and on-going investigations into harmonics and their deleterious effects. To complete the requirement for application, analysis, design and evaluation processes; these effects would be demonstrated on a specific machine.

To effectively evaluate the author's competence and assimilation of the report topic it must contain at **least 50% original** application, analysis, development and evaluation of source referenced information. In the above example, the effects demonstrated on a specific machine would entail at least half of the project report's content.

Analytical (Laboratory) Investigative Report: An analytical investigative report would involve the author's analysis, design and evaluation of a process, issue, problem, system, or equipment.

An example of an analytical laboratory investigative report may be a particular application for a programmable controller, or studying various aspects of a software package for analyzing distribution systems.

The "Analytical Report" will have the necessary references, texts, manuals, etc. The report will include analysis, design and evaluation. The analysis and data collection will be performed either by the author or under the author's supervision. The project report must be authored by the applicant and certified as such.

The Construction Project: A construction project report may require the applicant to complete performance tests, write specifications, or explore a range of applications. The emphasis of the report must be on the application of technology rather than the construction phase itself.

The "Construction Report" will have the necessary references, texts, manuals, etc. The report will include analysis, design and evaluation. The analysis and data collection will be performed either by the author or under the author's supervision. The project report must be authored and certified as such, by the applicant.

LETTER OF PROPOSAL (SYNOPSIS)

1. A letter of proposal defining the topic must be submitted to SASTT for approval prior to the creation of the technology report. This synopsis should set out the main divisions of the proposed report and the methods of treatment. This should not exceed two (2) pages (500 words). This will allow SASTT to determine if the topic will meet the requirements of the technology report.
 2. When the synopsis is approved, the candidate may proceed to produce a technology report which will be the product of the applicant's own design and expression. The completed technology report should be submitted within twelve (12) months after approval of the synopsis.
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TECHNOLOGY REPORT PRESENTATION

1. The technology report will be presented in a Cerlox or similar (lay-flat) binder. Pages will be printed on one side. Duplicates are required. One should be retained by the applicant. The other will be submitted to SASTT. The applicant should recognize the project report as a tool for employment interviews. It is a unique example of skill, competence and ability.
2. An electronic copy of the technology report on a USB stick or a CD is also required. The applicant must retain copies in case the delivered USB stick or CD is corrupted.
3. The following items will be required in the technology report: **(A model is included on pages 7 to 17)**
 - a) Cover page of the binder: technology report topic
 - b) Title page: project report topic, client, date
 - c) Signed declaration of sole authorship
 - d) Letters of request, proposal and transmittal
 - e) Table of contents
 - f) List of illustrations, tables
 - g) Abstract and/or executive summary
 - h) Body of the report, suitably divided, including scope, analysis, design, evaluation, costs, alternatives, management and conclusion.
 - i) A list of technical literature cited
 - j) A list of acknowledgements and sources of information
 - k) Appendix to include data, analysis, calculations, drawings used for determinations with the body of the Report.
4. In the technology report, the applicant will be expected to deal directly and concisely with the selection and definition of a problem, the improvement or proposed improvement of existing processes or procedures. Resolution or achievement of the topic will be demonstrated by the application of mathematical, applied science principles and related academics. **The elements of application, analysis, design and evaluation must be used in some fashion.** When applicable; alternatives, economics, time, resource, environmental, personnel, safety, professional and management issues must be included.
5. Source reports (Literature reviews) will not normally be accepted due to the difficulty for the author to incorporate original work. Original work must be included and will require the elements of application, analysis, design and evaluation to be used. This type of technology report must contain **at least 50% original work by the author.**
6. Where appropriate, the technology report will have illustrations, photographs, diagrams and tables. Sources must be cited.
7. The technology report must clearly demonstrate the applicant's ability and competence in the application of technical, mathematical and applied science principles. This is evidenced by the incorporation of the elements of application, analysis, design and evaluation. When applicable; alternatives, economics, time, resource, environmental, personnel, safety, professional and management issues must be included.
8. Recent (within the last 5 years) papers or reports, published or unpublished, conceived and produced solely by the applicant, which fulfil the requirements of the technology report , maybe submitted.
9. Applicants are advised to obtain their employer's permission to submit work of a confidential nature. Special arrangements may be made for confidentiality of the technology report, upon advance written request. SASTT reserves the right to determine the disposition of synopsis and technology report.
10. The applicant may be requested to attend an interview when a technology report is deemed marginal by SASTT.
11. A technology report with a "Fail" grade may be resubmitted once after revisions and this should be done within six (6) months of notification of failure. Where a technology report has received a failing grade twice, academic up-grading will be required. When up-grading is successfully completed, a new topic must be chosen and the process repeated with a new synopsis, etc.

PLAGIARISM

Plagiarism is the misrepresentation of another person's ideas or writing as one's own. The most obvious example is presentation of all or part of another person's work or paraphrasing another's writing without proper acknowledgement. Plagiarism will result in a failing grade and referral to the discipline committee for further sanctions.

THE FOLLOWING IS A PAGE BY PAGE FORMAT OF A TECHNOLOGY REPORT.

TITLE OF YOUR APPLIED SCIENCE TECHNOLOGY

RESEARCH PROJECT / TECHNOLOGY REPORT

Prepared by:

Word Count:

Date:

Rationale – Demonstrate applied science competency at the technologist level.

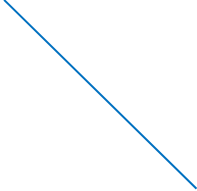
3,000 to 6,000 words
(Introduction through Recommendations)

Double spaced

Arial 12 font

Acknowledgements

(Example) I would like to thank Dr. Jane Smith for the mentoring she provided during this project. I would also like to acknowledge Bob Green, P.Tech.(Eng.) for allowing access to the laboratory and use of the test equipment.



Rationale – It is appropriate to acknowledge and thank individuals who aided, contributed, or acted as advisors to your report.

Executive Summary

The executive summary includes (very briefly):

Why the investigation was initiated

How the investigation was performed

An overview of the results

The conclusions based on the results

The recommendation (actions) based on the conclusion



Rationale – A brief description of the report content.

As the name suggests, the executive summary is a summary at the beginning of the report provided as a courtesy to the reader (possibly a busy executive) who may not have time to read the entire report. It should be written so a reader with some knowledge of the subject matter can determine if they need to read the entire report to get more detail.


The executive summary is brief (a few paragraphs to a page or two) and should be written last. Once the report has been written reduce the important aspects of the report into the executive summary.

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List of Exhibits

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Exhibit 2, (Example) Test results.....	
Exhibit 3, (Example) cost comparison.....	



Rationale – A technology report involves an investigation of a technical matter and must be supported by tables, charts, drawings, graphs, pictures, etc. These are all considered ‘Exhibits’ and must be listed at the beginning of the report.

Introduction


The introduction includes:

The purpose for writing the report (i.e. to select, analyse, design, evaluate, etc.)

The scope

General sources of information

Who authorized the report (if appropriate)



Rationale – The introduction is a 'roadmap' of the investigation that is the subject of the report.

Discussion

The discussion is the body of the report and will include the details of the research. The discussion will include the procedure used and data collected during the evaluation (voluminous amounts of data should be included in the appendix and simply referred to in the discussion).

The discussion should be divided into subsections as needed to provide a clear presentation of the subject matter.

The technology report must be the original work of the author of the report, but every report will require outside sources of information to substantiate and validate the author's results. It is not only required to source the subject matter of the report and include that source in the report, but it is also necessary to properly document the source of the research material. An example of a proper citation is below.

Test 6 and 7 of the investigation were performed outside in February when the temperature reached -40°C . The results obtained were consistent with results obtained above this temperature, but it should

How To

Do a proper citation

be noted that the instrument manufacturer indicates the “lowest reliable operating temperature is -30°C ” [1, p185]

OR

The technique used for drainage of the subdivision has been described as “a revolutionary approach to civil engineering” [2, p352].

Rationale – The citation indicates where to find the source of the outside information. The references are numbers sequentially as they appear in the body of the report [1, p185] Also indicated in the citation is the page number where the quote can be found [1, p 185]. The citations are listed numerically in the reference section where additional information is provided (see the reference section).

A proper project report is supported by data. This data is often in the form of tables, charts, drawings, graphs, pictures, etc. which are considered ‘Exhibits’. Exhibits are numbered sequentially from the beginning of the report using the format below.

Exhibit 1, Title

How To

Do a proper exhibit



Exhibit 2, Title



Rationale – Data that results from the investigation and presented as an exhibit must be numbered and included in the list of exhibits. Exhibits are numbered sequentially and labeled with the exhibit number and the title of the exhibit at the upper left of the exhibit using the general format **Exhibit #, Title**.

Information that is too voluminous to include in the body of the project report should be included in the appendix. The general format is.


After extensive testing, using trial and error, the results were bracketed between 30% and 40% (Appendix 1).

How To

Refer to the
Appendix

Conclusion


The conclusion contains the author's interpretation of the results (i.e. the selection, analysis, design, evaluation, etc.). The conclusion clearly articulates how the results achieved in the discussion section relate to the purpose for writing the project report that was indicated in the introduction. The conclusion is a demonstration of critical thinking related to the author's research. There are often a number of conclusions that can range from the interpretation of the results to an interpretation of the underlying theory, or possibly an interpretation of the validity of the test procedures used.



Rationale – The conclusion is the culmination of the investigation and interpretation of the results. The interpretation and explanation of the results must demonstrate the author's ability to think critically. Often this is done by comparing and contrasting the results with known theory, the expected results, or the results of similar investigations.

Recommendations

The recommendations are suggestions for change based on the conclusion(s). In the introduction the purpose of the project report was indicated. The recommendation section details potential resolution to the underlying issues that were the purpose for writing the project technology report. There must be a recommendation for each conclusion.



Rationale – The recommendations are linked to the conclusion and provide the author with additional opportunity to demonstrate critical thinking.

References

References are listed numerically in the order they appear in the technology report. The reference indicates the original author, the name of the printed material, the source of the material (including city when applicable), the date and the page number (in that order). Below are examples of a proper reference.

(Example)

- 1 Terman, P.P.: Electronic Measurement, McGraw-Hill Book Company, New York, 1952, p185
- 2 Smith, P.H.: An Improved Transmission Line Calculator, Electronics, January, 1944, p352

How To

Do a proper
reference

Appendix

The appendix includes information too voluminous for the body of the technology report. The appendix item is listed sequentially as they appear in the report.

Appendix 1

(Example) the entire Microsoft Excel spreadsheet of lab data.....

How To

Do a proper
Appendix

The following declaration is to be signed by the applicant, and countersigned by the employer/sponsor who is the immediate advisor or manager of the applicant. Self-employed applicants will require the signature of a recognized professional who currently works in the field of the applicant's discipline. This Declaration of Authorship and Confidentiality must be submitted with the technology report.

Declaration of Sole Authorship & Confidentiality

I, _____ hereby declare that the enclosed manuscript entitled _____, is of my own composition.

I declare that I have personal knowledge of the facts and conclusions set out therein, except where I have stated otherwise, and have in no degree committed plagiarism. On this basis I agree to have the report evaluated.

Date this ____ day of _____, 20__.

Applicant's Name (Please Print)

Applicant's Signature

Employer/Sponsor Declaration

I, _____ hereby declare that I have exercised due diligence to assure the Saskatchewan Applied Science Technologists and Technicians (SASTT) that the above statement is true and that the confidentiality of client(s) and/or project(s) meets federal and provincial requirements.

Date this ____ day of _____, 20__.

Rationale – The declaration of authorship is an independent verification of the legitimacy of the authorship.

Employer/Sponsor's Name (Please Print)

Employer/Sponsor's Signature

Company Name (Please Print)

Professional Designation of Employer/Sponsor

Employer/Sponsor Position/Title

Business Phone Number (include area code)

SASTT ensures the reviewers of this report adhere to all federal and provincial confidentiality requirements.

SASTT Examiner

Date Evaluated (mm/dd/yyyy)

The above declaration does not preclude the applicant from referring to books or office files or even obtaining verbal information to supplement points made in the paper. The applicant is expected, however, to give proper recognition for the type of information through the use of proper references.

This declaration when signed should be bound in the report and may follow the letter of transmittal.

Plagiarism (not acknowledging the original author of information) will result in a mark of 0% and the applicant will be required to wait a period of time before submitting another report.

Some References for Technical Writing

A great deal of research has been undertaken in what may broadly be called the field of practical writing, technical writing, writing on the job, business writing.

A contemporary writing text will take into account not only style in word choice and usage, but offers advice on writing processes, audience analysis, collaborative writing, post-writing procedures, use of computers in writing, graphics and page layout, and so on.

An “on-line” search will present many choices. A study will indicate the common themes to writing supported by the various sources.