|  |  |
| --- | --- |
| Activity 06-2 | Technical Writing |
| Textbook Reference: |  |
| Purpose / Goal: | To introduce technical writing elements as will be required for the various project deliverables. |
| Materials / Resources Required: | Textbook, Pencil/pen, paper, laptop, APA Style Guide - <http://www.ccp.rpi.edu/apa.html>, Final Report template available on LMS. |
| Time Allocated: | 50 minutes |

# Goals

This course includes professional development elements including both written and oral communications. Good communications skills are a key component of a successful engineering practice. No matter how great a design is the value is diminished if the designer cannot clearly and accurately explain the design! This same is true for students in this course.

Although there are several elements that differentiate technical papers from creative writing, technical writing is formal in style and more structured.

# The Types of Technical Document

There are two basic types of document used in this class:

|  |  |
| --- | --- |
| Technical Memo | A less formal document that usually covers only a single area or detail of a project or may act as a brief summary of work. |
| Technical Report | A structured formal document that completely describes a project, typically from start to finish. |

# Typical Document Contents / Structure

For a Technical Memo, the following sections would typically be included beyond the author’s name(s), the date and the subject:

* Introduction
* Main Topic
* Conclusion / Recommendation

The main topic can and should be broken into multiple sections as needed to help maintain the readability of the material. These subsections help organize the main topic. As the overall “structure” of the memo is relatively straightforward, no template is currently provided.

Because technical reports are more formal documents they generally have the following sections:

* Cover Page
* Executive Summary
* Introduction
* Requirements
* Design Process
* Final Design
* Results and Discussion
* Conclusions
* References
* Appendices

A complete template for the final report is available on LMS. The template includes directions on what to include with each section. While minor adjustments to the template may be appropriate for some projects, it is generally complete and sections should not be dropped without a discussion with the instructors. Ask your instructors if it is unclear where information should be placed in the report.

# Finding and Correcting Common Mistakes –

The following is a writing sample that includes mistakes of grammar, punctuation, and spelling. Working with your partner, can you find and correct all of the problems in the sample texts below? What else should be added to make the material easier to understand?

The design we have created, brings an alternat solutions, to harnessing wind power at an affordable rate.

The customer for this wind belt was originally targeted to be the average homeowner looking for greener energy solutions. However, after creation and actual testing was done, the optimal power output we were looking for was not achieved.  Therefore, we have changed our target customer to people who live in the mid-west or another windy location where power cannot be produced by traditional means, such as in a windy third world country.

It is designed to perform at a suitable level for the customer by oscillating at a defined wind speed threshold. The challenge was to determine, “dose this meet there requirements”?

The final design consists of a rectangular frame measuring 3” long by 18” wide by 4.5” high built out of ¼” thick polycarbonate plastic. 2” diameter PVC tubes are attached to the frame by threaded ¼” bolts and hex nuts, which allow for movement in the tubes and, consequently, the adjustment of tension in the ribbon. The ribbon, which is ½“ wide Mylar coated Taffeta tape, is secured to the PVC by the bolts and stretches across the length of the frame to the opposite PVC tub.

½” diameter by 1/8” thick neodymium (NdFeB) magnets with a strength of 1.48 Tesla each are placed on either side of the ribbon about an inch from the PVC tubes.

The frame may be made first, using a band saw to cut the pieces of the basic frame and the brackets. The brackets may be secured to the frame material with rivets and a riveting tool, or small nuts and bolts. Any holes that are to be riveted must be pre-drilled. After this is complete, drill one hole on each side of the frame which will be used to insert the bolts for the tensioning device.  Once these holes have been drilled, four holes need to be drilled on each side of the top and bottom pieces of the frame in order to attach the coils. The coils may be attached solely their with eight zip ties, two for each of the four coils. The Mylar coated taffeta tape may be attached to the tensioning device by cutting a small slit in the tape, and inserting the bolt through the tape when the construction is complete. Two magnets must carefully be attached to either side of the tape, as they are often delicate and brittle. The pulling force of the magnets and friction against the tape will hold them in place. The magnets should be attached to the tape and separated only by the thickness of the tape.

## Evaluation –

The instructor will select teams to share their findings with the class. How can the material be improved?

# Properly Citing Material –

Information that is properly referenced allows the reader to use that reference to gain additional information and understanding of the material. This also provides credit to the author of that material for their work. When references are not included or are not properly made, the reader may have difficulty checking the facts or confirming the information as presented. At worst, lack of proper citations could result in plagiarism which is a violation of our Academic Policies.

A simple guideline for illustrations, pictures and diagrams – if you did not draw it from scratch or actually take the photograph yourself, it must be cited!

## Exercise –

Write a small paragraph summarizing the section “Hints for Generating Solution Concepts” on Page 109-110 of your IED textbook. Properly cite the source (or sources if they are within the section) below the paragraph.

# Adjusting To Formal Writing Style

It can be a challenge for students to make the transition from creative writing to technical writing. Ask yourselves some of these questions as you review the material:

* Was any information missing?
* What information wasn’t there?
* Did you have to make any assumptions? What where they?
* How can this writing be improved?
* In addition to different wording, what else would make this easier to follow?
* What does this device / project look like?
* How well are the “5 W’s and 1 H” addressed? ( Who / What / When / Where / Why / How )

Working with your partner, rewrite the following sample text from their casual / informal style to a more appropriate formal style suitable for use in a technical memo.

I wanted to build a new method to detect bats entering and leaving caves so I researched it. Then I figured out how to detect the bats. Then, I looked for ways to connect sensors to a computer. I discovered that my laptop was out of disk space. What I discovered was that this would be really really hard! So then I looked at other ways to do it.

When I bought all the stuff I needed to build the detector I was missing some parts. Some sockets and some connectors. I had most of the chips already and I borrowed some from a friend so it was almost free. I stayed up all night and worked really hard on the box for this. I put the circuit board inside the case. The case was 3 inches deep. It ran on batteries. I connected a red wire to the plus terminal on the battery and to pin 5 of the circuit board. I also connected ground. There were three more pins to connect to the other chips on the circuit board. The chips needed five volts to work rite.

A small motor turned the wheel on the door to make it open and close by turning just a little bit. It worked really good. It worked once and opened the door. In theory, it could open a bigger door too. Their was a handle on it to make it easier. With a bigger handle you could use two hands.

Because bats live in caves the project had to work outside. In the winder the bats sleep. They sleep most of the winter. So the hole project has to work in the cold, even the coldest parts of New York. Volunteers and people would check on the project to see how many bats came in and how many came out.

When the project was done it worked perfectly. It counted ten bats.

## Evaluation –

The instructor will select teams to share their findings with the class.

# Resources

Center for Communications Practices at Rensselaer, APA Style Guide - http://www.ccp.rpi.edu/apa.html