

The final report is due on the last day of classes

FOLLOW THE REPORT STRUCTURE EXACTLY AS SHOWN BELOW. INCLUDE ALL TITLES (1,2,...) and SUBTITLES (a, b,...).

Report Structure

Your report should be no more than 5 pages and should cover those topics typically seen in an engineering report for a design project. Use times New Roman, font size 12 and 1.5 spacing.

It should include:

Title: Design process of room temperature monitor

Name and BU ID

1. Summary

The Summary is usually written last of all. It provides a brief overview of the substance of the report. It is a stand-alone document generally used by busy managers who might not have time to read the full report. The Summary is not an introduction to the topic. It should focus on what you did, how you did it, and the main outcomes and significance of your work.

The Summary:

- States the topic of the report;
- Briefly outlines your approach to the task (if applicable);
- Focuses on the results or outcome of the project, the findings of your investigation: or the key aspects of your design;
- States the significance or implications of the results.

The Summary does NOT:

- Provide background information on the topic;
- Explain the motivation for the project;
- Refer to figures, tables or references contained in the report.

Length: Quarter-page to half-page

2. Introduction

The Introduction tells the reader what the report is about. It sets the project in its wider context, and provides the background information the reader needs to understand the report.

The Introduction:

- Introduces the topic of the report in context;
- Explains the problem and/or motivation for the project;
- States the aim/s of the project;
- Indicates the purpose of the report.

Length: Half-page to one-page.

3. Design elements

In many projects you are given a task, some background information and some guidelines, but you are expected to make many decisions yourself, based on your own design. Explain why you made the choices you did, so you will need to show the reasoning behind your decisions. You are using the same components; however, you may produce multiple layouts. Things you need to address:

- a. List all components used in your design (electronic components, hardware,...)
- b. Precision measurements that you have made. Make a table of relevant dimensions (see example table below).
- c. CAD drawings. Those can be represented as screenshots of your final assembly (HW4).
- d. Add top view picture of actual prototype with and without the lid while turned on.
- e. Purpose of using an Arduino board. Explain what the Arduino board does in your circuit.
- f. Wiring diagram and suggested wiring methods (soldering, jumper wires, twist nut caps, spade connectors,...)
- g. Specify the wire gauge used and justify it. Jumper wires vs 22 AWG. What values of resistors are being used in series with Green LED and Red LED? What are the operating currents for both LEDs? Use KVL to explain that.
- h. Internal power supply. Why you use a 9-V battery? What its charge capacity? Is this a good option? For how long does it last? Can you power the device externally?
- i. Arduino code used in your design.
- j. Specifications of your prototype (voltage of the power supply, operating voltage of the circuit, total current drawn and operating time of the battery). Use your DMM to measure the total current drawn. This can be done by turning the switch off and placing DMM leads (on current settings) on the switch terminal. Specify the temperature range based on the sensor specifications from the data sheet. Specify the temperature range that you consider comfortable. Using KVL, explain the use of 1 K Ohms resistor with green LED and 220 Ohms resistor with red LED.

4. Evaluation of Results

- Indicate the extent to which the design objectives have been achieved
- Summarize the outcomes or information in your report. Compare to standard thermometers.
- Acknowledge limitations and make recommendations for future work where applicable (battery lifetime, size, weight,...)
- Highlight the usefulness of your work.

5. Supporting Materials (appendix)

Appendices contain material that is too detailed to include in the main report, such detailed sketches or CAD technical drawings.

Example: the table below can be used to document the relevant dimensions of all components of your design. Sketch identification means the view that you have measured. As an example, you need to make an opening for LCD screen. In the front view of the LCD bezel you see a rectangle and 4 holes. Your sketch identification will be LCD front view (sketch x). This table is expandable to accommodate multiple views.

Item	Sketch identification	W [mm]	L [mm]	H [mm]	Diameter [mm]
ABS enclosure					N/A
Arduino Board					N/A
Switch					N/A
LCD 2X16					N/A
Buzzer		N/A	N/A		
Temperature sensor		N/A	N/A		
LED		N/A	N/A		