AGH University of Krakow

Faculty of Mechanical Engineering and Robotics
Department of Robotics and Mechatronics

<Full subject name>

How to prepare a report?

Laboratory No. 1

Author:	mgr inż. Jakub Szczepaniak
E-mail:	jakubsz@agh.edu.pl
Student ID:	<your student ID>
Group:	<your group number>

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1 Report preparation guidelines

1.1 Title page

The title page is the first thing that a reader sees. A well-prepared title page signals that you take the work seriously — a sloppy one creates a negative first impression that colors the reading of everything that follows.

The title page should contain:

- Your name, surname, and student ID,
- Contact information (your university email),
- Subject name and laboratory number and topic,
- Group number and submission date.

Every field on the title page exists for a reason — if any of them is missing, the reader has to go looking for information that should have been provided upfront. You can see the example of a title page at the beginning of this document.

1.2 Describing your work

The body of the report is where you demonstrate not just that you completed the task, but that you understood it. Each exercise should be described in logical steps that mirror how technical work is communicated in professional and industry settings.

1. Rationale:
   Begin by briefly explaining why the task was performed — what problem it addresses or what phenomenon it illustrates. This does not need to be long, but it should be written in your own words. Copying the objective from the instruction sheet is not sufficient; restating it in your own terms shows you understood the purpose before you began.

2. Method:
   Describe how you carried out the task — the tools, parameters, and procedure used. Be specific enough that someone reading the report could reproduce your work without access to the original instruction sheet. Avoid vague phrases like "the signal was processed" — state what processing was applied, with what settings, and why.

3. Results:
   Present what you obtained — measurements, plots, computed values, or observations. Every figure and table must be numbered, captioned, and referenced in the text before it appears. Axes must be labeled with units. Do not leave results to speak for themselves; introduce each one with a sentence explaining what it shows.

4. Conclusions:
   Interpret your results — do they match theoretical expectations? If not, explain why. Identify any sources of error or uncertainty. Conclusions must refer directly to your results; general statements that could apply to any experiment ("the exercise was completed successfully") carry no value. A good conclusion answers the question: what did these specific results tell you?

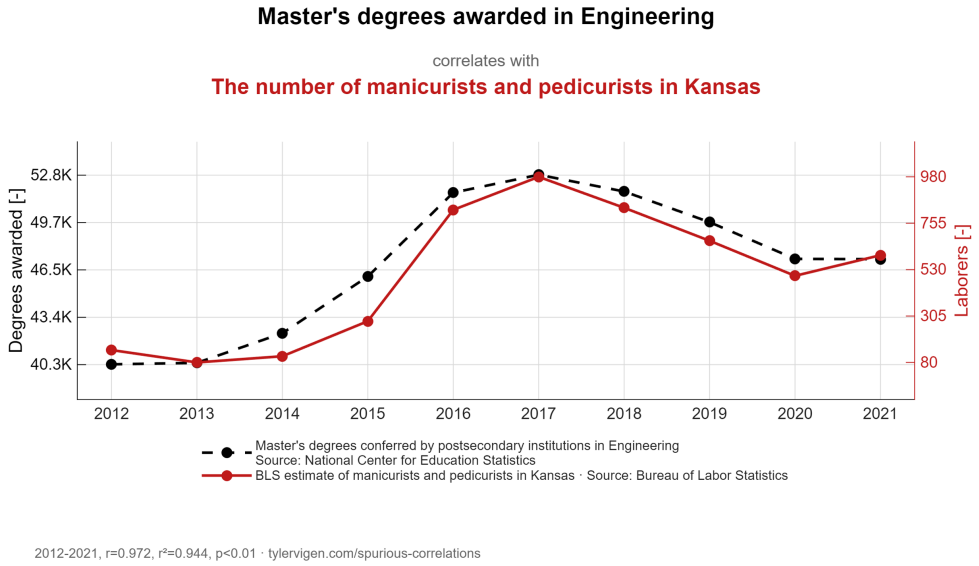

Figure 1: Example of a properly formatted figure. Axes are labeled, a legend is present, and the content is legible at standard print size. Source: Spurious Correlations website

1.3 Figures formatting

Figures are part of your argument — a poorly prepared plot undermines an otherwise solid report. For example of correctly prepared figure, see Figure 1.

- Export quality:
  never use screenshots of plots. Always export directly from MATLAB, Python, or whichever tool you used, at a minimum of 300 DPI. Screenshots are blurry, inconsistently scaled, and unprofessional.

- Captions:
  every figure must have a caption placed below it. A caption should describe what the figure shows, not just label it. "Figure 3. Results." is not a caption — "Figure 3. Correlation between UFO sightings in Texas and popularity of first name Dominik" is.

- Numbering:
  number all figures sequentially throughout the report. Every figure must be referenced in the text before it appears — if you have not pointed the reader to it, it should not be in the report.

- Readability:
  ask yourself whether the figure is legible when printed in A4. Specifically:

  – axis labels and units must be present on every plot

  – legends are required whenever more than one series appears

  – font sizes within the figure should be comparable to the body text of the report

Further reading - producing figures that communicate clearly is a skill in its own right. For guidance on how to present data effectively, look up the term *data storytelling*.

Figure 2: A cat belonging to the author of this instruction. The term "figure" covers all visual content — plots, photographs, diagrams, and schematics.

1.4 Figures, pictures and tables

As mentioned in Section 1.2, every figure, table and picture must be numbered, captioned, and referenced in the text. The term "figure" covers all visual content — plots, photographs, diagrams, and schematics — and the same rules apply to all of them (see Figure 2).

1.5 Code listings

If your results were obtained through a script, include the relevant code in the report. Do not paste entire files — include only the fragments directly relevant to the described task. If a code is too big to fit on one page, consider submitting it as a separate file. In general, it is not good practice to paste several pages of code into a standard report. The code must be formatted in a monospace font and, where your tools support it, with syntax highlighting (see Listing 1). Every included snippet should be referenced in the text and accompanied by a brief explanation of what it does. Code without context is not self-explanatory, even for an experienced reader.

```
n=800;
[R,T]=ndgrid(linspace(0,1,n),linspace(-2,20*pi,n));
x=1-(.5)*((5/4)*(1-mod(3.6*T,2*pi)/pi).^2-.25).^2;
U=2*exp(-T/(8*pi));
L=sin(U); J=cos(U);
y=1.99*(R.^2).*(1.2*R-1).^2.*L;
K=x.*(R.*L+y.*J); X=K.*sin(T);
Y=K.*cos(T); Z=x.*(R.*J-y.*L);
surf(X,Y,Z,'LineStyle','none')
grid,axis off;
colormap(nebula)
```

Listing 1: An example of MATLAB code. You can try to paste it to command window and see what happens. (Author: Sudharsana Iyengar)

1.6 Final remarks

Use a consistent font type and size throughout the report — mixing styles within a document looks careless and is distracting to the reader. Number your pages. It makes the document easier to navigate and allows for precise feedback — "see page 4" is more useful than "somewhere in the results section." For broader guidance on writing and presenting technical work clearly and professionally, the following resources are worth your time:

- Nature's formatting guide for authors - useful for scientific writing,
- Google Developer Documentation Style Guide — useful for anyone writing technical documents.

2 Checklist before submitting the report

Checklist Before Leaving the Lab

- ☐ I have read this document in its entirety
- ☐ Information on title page are correct
- ☐ Each exercise contains: rationale, method, results, and conclusions
- ☐ Conclusions refer directly to my results — no generic statements
- ☐ All figures are exported directly (no screenshots), at 300 DPI minimum
- ☐ Every figure is numbered, has a descriptive caption and is referenced in the text
- ☐ All plot axes are labeled with units, with legends that are present wherever more than one series is plotted
- ☐ Only relevant code fragments are included, code is formatted in monospace font
- ☐ Each snippet is explained in the surrounding text
- ☐ Font type and size are consistent throughout, Pages are numbered
- ☐ The text is justified
- ☐ File is submitted as PDF, named clearly

3 Additional tips and remarks

3.1 Useful tools

LaTeX + Overleaf — for report preparation, LaTeX produces significantly cleaner and more professional results than word processors, particularly for documents containing equations, code, and figures. Overleaf is a browser-based LaTeX editor that requires no local installation. AGH University provides premium Overleaf access — sign up using your university e-mail.

MATLAB — MATLAB's built-in plotting tools produce publication-quality figures with relatively little effort. Even if your data processing is done in Python or using ther tools, consider exporting the results and plotting them in MATLAB — the difference in output quality is often noticeable.

3.2 How to Make Figures Readable When Using MATLAB in Dark Mode?

By default, MATLAB figures displayed in dark mode have low contrast and are not suitable for reports or presentations. To fix this, switch the figure theme to light: go to the **Home** tab → **Settings** → **Appearance**, and change the figure color theme (see Figure 3).

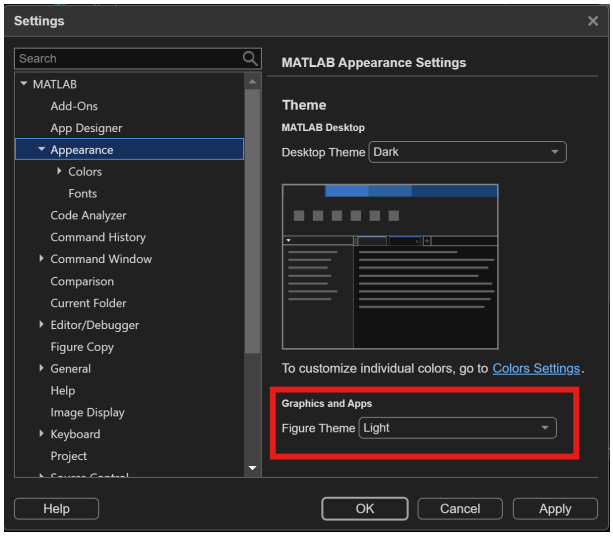

Figure 3: Settings window of MATLAB 2025B.