

Submission Guidelines

These are the guidelines that will be considered when grading your assignments. We strongly advise you to follow them not only to get better grades, but because they are pretty close to what a scientific article submission requires. If you prepare your assignments adhering to these guidelines, you are going to have a reasonable template for your thesis and first articles etc.

The weights of the elements for the grading are included at the end of the file.

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1 Submission process

Please submit by uploading one single PDF file to the appropriate directory on Kooplex-edu (<https://k8plex-edu.elte.hu/hub/>). Submit all of your code alongside the PDF file, but refrain from including raw code in your report. (A short tutorial on how to submit can be viewed at https://icsabai.github.io/simulationsMsc/kooplex_tutorial2019.pdf.)

Keep in mind that your work will be collected automatically, so if you do not upload to the correct place, it will be seen as if you had no submission.

2 Short description

Two to three weeks prior (see deadlines on the course webpage) to submitting your final project report you are asked to introduce your chosen topic in a concise manner. This allows us to give feedback on your initial ideas and to advise you to expand on specific subtopics whenever necessary. Providing a short description of your project also forces you to research the problem and to start familiarizing yourself with the computational tools you are intending to use.

Short descriptions are not graded, but you can avoid common mistakes by paying close attention to the feedback you get on them.

In an ideal short description you should

- describe the problem you chose in some sentences, give the most important equations, figures etc. (topic)
- introduce it in broader context (background)
- give reasons why you chose this particular problem (motivation)
- list the necessary methods and tools you plan to use for the solution (proposed solution)
- discuss potential error and difficulty sources (obstacles?)
- describe what your expected outcomes and results will be, and how you can test their validity, if applicable - e.g. how you can compare your results to literature values or results (hypothesis).

Your short description should not be longer than a few (2-3) pages with figures, equations and references included.

3 Project report

3.1 Content

Motivation. Please try to introduce your subject in a way that raises interest. It does not suffice only to state that this was a school project assignment, maybe it helps if you think about what intrigued *you* most in the assignment. If you have no better idea, you can write about what motivated others when they were thinking about the problem. Try to think as if you were the reader, who has to read several assignments (articles) in a row, and you would like to hook his or her attention.

Introduction and theoretical background. Try to place your project work in a broader context to help the reader evoke his or her connotations and former knowledge on your subject. Write as if the reader had only superficial knowledge of the area, and keep in mind that even if the reader is an expert, it is most likely that at the time of the writing you have spent much more time with your subject than he or she has. Your text should be self-contained, that is, it has to be coherent in a way that the reader does not necessarily have to turn to other resources in order to roughly understand your subject.

Always include ideas and formulas that you are going to test in your work, and explain the notations you use. Explain briefly your methods. Even if they are widely known, explain your choice in a sentence, but do not discuss in detail (only if you added some new elements to the implementation, but then, the method in itself will be part of your work), cite further resources, if necessary.

Emphasize your contribution. You should make it clear what your own contribution was. Even if you work on known/solved problems, as in the case of assignments, write about the ideas and questions you had concerning your simulations, and emphasize how you tested these ideas or what part of your own work answered those questions. If up to some point, the work was done by somebody else (e.g. you contributed to/experimented with a larger open-source/open data project), explain again, what you added to the work done by others.

Discussion. The most important part of your work is when you present your results, and you evaluate whether they fit into your expectations or not. Below, we present our most important questions, think of them while writing!

- Is it the number/function/behaviour that is in the literature? Is it what you expected? If yes, please underline that your results are in accordance with the theoretical/literature/expected/experimental behaviour, values, functions. Discuss errors.
- If not, then why not? Could you think of methods with that you could improve your results (you don't have to implement them, only think about it)?
- Are you sure that you did not underestimate your error? How did you estimate your errors?
- Can you reach the limits of your model, or the limits of your computer? Try to discuss scenarios, when your algorithm fails. What is the role of numerical error in your work? Does this influence your results? *Experiment and play* with your simulation/data, it is (as opposed to real experiments) costless!
- What has been difficult to realize? What are the pros and cons of the methods you used?
- Present measurable quantities, if there are several parameters of your model, explore the parameter space, demonstrate the fundamentally different behaviours!

Conclusion. Please wrap up your work at the end of the assignment, again, underline your own contribution, state the main results. It helps the reader to summarize and to see what you wanted to emphasize.

3.2 Format

PDF. You can write your assignment with your favourite text processing engine (Word, Latex, Jupyter Notebook etc.), as long as you submit your work in one single PDF file that contains all

of your figures, text and tables. However, it should not contain your code! Think of your code as your lab experiment, and your project work as your research article. If you do not submit a final codeless PDF report, your work will not be graded.

If you have problems exporting your Jupyter Notebook directly to PDF, or exporting it without code, check out nbconvert's option to convert it to tex, then format it in your favourite tex editor, and compile to PDF.

Sectioning. A good header containing your name, the date and the title of the project always helps. Even if you don't make any headers, you should include an article-like title section with at least the the project title, the course name, your own name and the actual date.

Make a reasonable division of your work by using section and subsection headers. Make sure that the margin, font choice and the font size provide the reader with maximum readability. Pay attention to page breaks, paragraph and line spacing, remain moderate in formatting.

Language. You have to submit your work in English, as that is the official language of the course.

Pay attention to orthography and your choice of words *in both languages!* Use a spell-checker: it removes most of the annoying mistakes. Have your document proof-read, if you are not sure in your own skills *in both languages!* Wrong spelling can make the understanding and the interest of the reader decay with a remarkably short half-life.

Remain objective and concise. Do not use very long sentences, pay attention to using the special terminology of your subject.

3.3 Figures

All figures must have a numbering and a short caption describing the content. Figures are the first objects a reader skims through after the introduction. The captions and the legend should provide enough information to understand the content of your figure. If you refer to the figures in your text, use the numbering you introduced.

If possible, include vector graphics in your work (PDF, SVG, EPS).

Pay attention to line width, the color choice, axis title, tick label and legend font sizes. They all have to be easily readable in your paper.

Always write axis titles with units, and clear legends that explain colors, lines and markers on your figure.

Minimize figure margins, padding and whitespace in them.

If possible, have a consistent color scheme across all figures. Especially when simulation runs or different experiments are shown through different measurements or parameters, colors must remain consistent.

3.4 References

All external sources must be indicated in the text, and listed in a reference list below the document. In Latex, using BibTex is the most convenient way to produce this output. Most reference management softwares provide BibTex support: the easiest way is to collect the articles or web pages you use as sources during your working phase in Mendeley (free), EndNote (free academic

account is available), Zotero (free), KBibTex (free) or other reference managers, and then let LaTeX handle your citations in the default manner.

Documents without references will not be accepted: it is simply not possible that you worked without sources. We strongly encourage you to try to read or use some parts of original research articles.

4 Presentation

At the end of the course, you will have to prepare a single ten-minute presentation that includes the most important results of both of your assignments. Only those students will have the opportunity to give a presentation who succeeded in acquiring a grade of 2 or higher for both their project reports. Below are some points to pay attention to when preparing your presentation.

Time limit. Take the time limit seriously. After ten minutes, your presentation will be stopped, as you will be allowed only two more sentences. A good rule of thumb is to prepare as many informative slides (apart from the title slide and the last one thanking the attention) as minutes. Think about your main and most interesting results, thread them up into a good storyline for the presentation and make sure to emphasize your own contributions to each of your projects.

Formatting. For the preparation of figures, refer to the previous section. It is always a good choice if your beamer/PowerPoint/etc. template is in harmony with your figure colors. Have a consistent template (colors, elements, fonts etc.) across all slides, but be moderate in your choice as it is a scientific presentation.

Prepare a header and/or footer that contains at least your name, the presentation title and the slide number. Do not let any text or figures overlap with your template or title elements. All slides should have a title.

Place as little text on your slides as possible. Only key terms, ideas and formulas that you tested are necessary. Text is only a tool to focus and guide your audience's attention, but you'll explain everything not written there anyway.

Questions. Be prepared to answer a few basic questions regarding your projects and also about the course material.

5 Grading

During the semester, you will receive three grades, one for each of your project reports and one for your presentation. Your final grade will be determined as the average of these three grades. (No further examination will be held in the exam period.)

Project reports. For each of your project reports you'll be proposed two grades from 1 to 5 (5 being the best) on each of them: one for the content and one for the format of your work. The grading will be based upon the above guidelines.

If you submit after the deadline, your grade will decay obeying the following law:

$$G(t) = G_0 - 0.5 \cdot t,$$

where G_0 is your proposed grade based on your work (it is the average of the content and the format grade), and t is the integer number of days (24 hours) passed since the deadline.

Presentation. For your presentation, you will also get two grades, one for content and one for the overall impression of your speech including format and understandability. Your grade for the presentation will be calculated as the average of these two.

6 Cheating and plagiarism

Plagiarism (copying your code, your results, your figures or any of the text of your project from someone else or from the Internet) will not be tolerated and will result in an automatic grade of 0 for the given project.

If you show an obvious lack of understanding of your projects during the presentation, we will take extra caution to look into the sources of your work which might reflect badly on your grades.

7 Retake exam

If you fail to obtain a grade of 2 or higher for any of your project reports, thus lose the opportunity to give your presentation, you can take an oral examination during the exam period. This will require you to make corrections to your reports based on the feedback you got during grading. The oral examination will also include detailed questions about the course material besides testing your understanding of your two chosen topics.

You can also opt to retake your exam if you are unsatisfied with your proposed grade by updating your project reports based on the received feedback and preparing from the course material.