

A short guide for use of generative AI in studies at the Department of geological sciences

Based on “A short guide for use of generative AI in studies at the Department of physical geography”

Practical tools based on artificial intelligence are in rapid development. The kind of AI tools which generate an output based on your input (in the form of a so-called “prompt”) are collectively referred to as “generative AI”. These tools can be very useful in studies and research as they provide an opportunity to improve the quality of your work, but they may also lure you into cheating.

At all departments in the Faculty of science and mathematics at Stockholm university, there is a policy for students’ use of generative AI, explaining what kind of use is accepted and under what conditions. To summarise it very briefly, we permit the use of generative AI as a support tool but not for creation. This means that you are not allowed to submit AI-generated output presented as if it is your own work. Presenting a text, image, or other content produced by a generative AI tool as your own is considered plagiarism; it can be compared to stealing/copying someone else’s work or hiring a ghost writer.

The use of generative AI as a supportive tool in your studies, however, is encouraged: generative AI can help you brainstorm, plan your work, get feedback on writing style, write code, etc. In this short guide, there are some examples of proper use of generative AI in your studies, permitted under the policy at the department. You are briefly introduced to prompting and “prompt engineering”, and then provided some (hopefully) useful prompts to try out for yourself. This guide is limited to use of text-based generative AI (often called “chatbots”).

As generative AI is developing rapidly, it’s important to stay aware of recent developments in the tools you are using. Also remember that generative AI must be used in an ethically sound manner. You must to be aware of the limitations of the tools you are using, including possible biases in their training data.

Note! On each individual course, the teacher may decide what type of AI use is accepted or not. Make sure to always be aware what is permitted for each course task!

A brief introduction to prompting and prompt engineering

To use a chatbot, image creator, or other type of generative AI, you provide the tool with a prompt as input. This prompt is a piece of text that the statistical model behind the tool will interpret in order to respond with what it determines to be a statistically suitable output. It's important to realise that the model does not really “understand” the prompt or its own response; it is all computations based on a vast (but finite) set of training data for the model.

The prompt can be a question, such as “What is earth science?”; this prompt will lead to a statistically likely answer to the question. The prompt can also be an order, such as “Describe earth science.”; this prompt will likely lead to a similar response as the question example. To use generative AI in more advanced ways than simply looking for answers to questions (which you could as well use a simple web search for), you need to do some prompt engineering.

Prompt engineering, simply put, means adjusting your prompt with more details to get a more useful response for your specific purposes. A simple example would be “Describe geology in relation to the wider subject of earth science.”; this instructional prompt would likely lead to a response with a somewhat different focus of the contents compared to the examples in the paragraph above. Another example would be “Describe earth science as if explaining it to a child”; this audience prompt would likely lead to a similar response as the examples in the paragraph above in terms of content, but the language could be expected to be significantly simplified and less terminology-heavy. Yet another example would be “Describe earth science as if you are a journalist.”; this role prompt would likely lead to a response with another type of writing style.

Prompt engineering can be used to enable very specific uses of a chatbot. This is where things get interesting for the purpose of using chatbots to support studies. For example, you could instruct the chatbot to act as a personal tutor and give feedback on your writing, or to help you plan the workflow of a study, or to identify errors in your coding. This requires more detailed and often contextual prompts, where instead of just writing a question or direct order, you must include some context and/or more specific instructions. The rest of this guide provides some example prompts for you to use in your studies.

Note! When using generative AI tools, be aware that the companies offering these services may be collecting information from your use of them. You are therefore advised not to include copyrighted, personal or other sensitive information in your prompts.

Useful prompts for studies

The prompts provided here are a limited number of examples of how you can use generative AI to support your studies. They can be used, combined, and reimagined as you see fit, and should act as inspiration for your own prompts. Remember that you can get more relevant responses by adding more details to your prompts, such as contextual information (for example about the course you're taking, the study task you have, or what your current progress is in the course or specific task) or words that act as modifiers (for example, instead of prompting "Summarise [...]", you could prompt "Summarise concisely [...]").

Note! *If you use generative AI tools for a specific course task, the Faculty AI policy states that you must disclose this use properly, i.e. explain what tool you used, how and for what purpose.*

Brainstorming

I am taking a course in [insert course subject]. I have a study task that is to [briefly describe study task]. Summarise the current state of scientific research that may be relevant for this task in this subject.

I am taking a course in [insert course subject]. I am writing about [briefly describe writing topic]. Provide three different examples of research questions relevant to this topic.

I am writing about [briefly describe writing topic]. My research question is "[insert research question]". Provide a list of ten relevant keywords for my literature search on this topic.

I am writing about [briefly describe writing topic]. My research question is "[insert research question]". Provide three alternative phrasings of this research question and give some examples of relevant themes to explore in my writing.

I am taking a course in [insert course subject]. I am writing about [briefly describe writing topic]. I argue that [describe argument]. Provide a counterargument with some evidence to support it.

Note! *The output of a generative AI tool is only a statistically likely response to the prompt. Never trust the response blindly; always fact-check any information provided by an AI tool. Some tools do not have the capability to search the web or provide sources. Some may "hallucinate" fake references when asked for them, if the tool does not have the capability to search the web.*

Planning

I am taking a course in [insert course subject]. I have a study task that is to [briefly describe study task]. Provide a suggestion for how to approach this task and what to do first.

I am taking a course in [insert course subject]. I have a study task that is to [briefly describe study task]. I have [specify timeframe] to complete this task. Provide a workflow to complete this task on time.

I have to read [specify number of pages/chapters/articles] for my course studies. Provide an encouraging plan to get this reading done in [specify timeframe].

Writing

I am taking a course in [insert course subject]. I am writing about [briefly describe writing topic]. Suggest relevant headings for this topic, with a logical structure from one theme to the next.

I am writing about [briefly describe writing topic]. Check if the following text is clear and logically structured. Respond with suggestions for improved writing without any specific examples for edits. [insert text to check]

Note! *The following prompts work when using a chatbot which can analyse the contents of a document, if you open the document in, or upload it to, the service. Remember that you are advised not to do this with any work that is copyrighted or includes personal or other sensitive information. You could rewrite the prompts to work with a copied text instead, but some chatbots have a word limit that might not allow for the work to be entered all at once.*

Does the work in this document adhere to “the seven C’s of academic writing”: clear, concise, concrete, correct, coherent, complete, and courteous? Respond with suggestions for improved writing but without any specific examples for edits.

Does the work in this document clearly state and answer a research question? Respond with suggestions for improved writing but without any specific examples for edits.

Does the work in this document have a logical structure and comprehensible text? Respond with suggestions for improved writing but without any specific examples for edits.

Coding

Generative AI (e.g. Chat GPT) is a very useful tool for coding in many programming languages. Note that the same rules regarding academic misconduct/plagiarism apply for code as any for other material.

It is important to carefully read and evaluate code results from AI, to make sure that it performs what it should and that you understand everything it does. All code handed in by students (in exercises, assignments, examinations, or theses) should be thoroughly supplied with written comments so that it is clear that the student understands the function of every part of the program.

Some additional tips and tricks

Most chatbots have the ability to keep track of previous prompts and responses within a chat. If using such a service, you only need to provide the context for what course you are taking, what your task is, or what you're writing about, in the first prompt of the chat.

Some chatbots have adjustable settings that will affect the kind of responses you get. If there is an option for this, it could be useful to set it to a more "creative" mode when brainstorming and to a more "precise" mode when reviewing your writing.

If you're getting responses that are too long, add something like "Respond with no more than 100 words." at the end of the prompt. This forces the chatbot to be more concise.

If you're getting responses that are too technical, try adding "Respond in simple language." at the end of the prompt. This will likely make the response easier to digest.

If you're getting responses that aren't quite what you expected or seem to have missed your point, use a follow-up prompt to specify this. You can describe this in a natural language, as if having a conversation, and the chatbot will then very likely "understand" what you mean and adjust the response.