Universität Göttingen
Institute for Computer Science / GWDGHigh-Performance Computing System Administration / WiSe 2024/25
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Project Overview

In order to obtain the credits, you will look deeper into an administration topic and complete one of the following options:

- Evaluate a tool practically (on GWDG systems and/or your laptop)
- Write your own use case(s) to demonstrate the capabilities of a framework/tool
- Create a performance analysis for one or more tools and write a benchmark
- Compare different tools in theory and practically
- Extend one or more existing tools

For this you will be assigned a supervisor who can help you find a direction for your chosen topic and give you feedback. You can collaborate with students from the same or related topics but need to complete your work individually.

Finally, you are expected to hand in a written report, which presents your topic, your work and your results. The report should cover 10 to 15 pages of core content from introduction to conclusion. We like to publish student works on the course web page, if you do not want your report to be published, you can opt out by saying so when handing in your report.

The successful participation in the course to be awarded with the university's credits consists of the following stages and rough schedule:

1. 07.10.2024 - 11.10.2024 - Block course: You completed the block course.
2. Chose a topic from the list `https://hps.vi4io.org/teaching/autumn_term_2024/hpcsa#topics_for_practical_works` or suggest a topic.
   01.11.2024 - Contact us (jonathan.decker@uni-goettingen.de) with your preferred topic.
3. 08.11.2024 - Assignment of supervisor: We will assign a supervisor per student.
4. Contact your supervisor and discuss your topic and what work you could do for your project.
5. Work on your project, get feedback from supervisor.
6. Write your report, involve your supervisor for feedback.
7. 31.03.2025 - Submit your final report per email as PDF to us (jonathan.decker@uni-goettingen.de) along with a ZIP file of the code you have written, if any, or a link to a public GitLab or GitHub repository with your code.

The report will account for 100% of your grade.
You have to contact your supervisor first, they will only respond to requests coming from you.

Credit Options

Depending on the effort you are willing to put in this course, you can choose between 6 and 9 credits. The course module M.Inf.1831 itself gives 6 credits and can be extended via module M.Inf.1834 for another 3 credits. Please note that M.Inf.1834 can also be taken to extend our course PCHPC and it can only be taken once.

The more credits you request, the more strict we will be when evaluating your work. Make sure to state how many credits you request when handing in your final report, otherwise we will default to 6 credits.

Estimated by 30 hours per credit point, the amount of hours to be spent on the project are estimated as follows:

Credits	Block course	Supervisor interactions	Project Work	Prep report
6	40	6	99	35
9	40	10	170	50

This is just a suggestion for your project plan to show how the available time can be distributed.

Task 1: Project Work

Reach out to your supervisor and discuss your project goals. Depending on your topic you might be working via the SCC, a VM on your local machine or VMs on cloud machines. As the course accounts for OpenStack are only valid for one week after the block course, you should request access to cloud resources in time via an email to cloud-support@gwdg.de .

Depending on the goal of your project, it is possible that your project might fail and you do not achieve the goal you set out to accomplish. As long as you show qualitative work through your report and that you have understood the concepts and tools you have been working with and that you were working towards a novel contribution, you can still earn very good grades.

Hints

- Your access to the SCC will be valid for the entire duration of the course and can be used for your project as necessary.
- The command line editors nano and vim might be suboptimal for you to work efficiently.
- We recommend using a tool such as SSHFS to mount the code remotely. This way you can use any IDE or editor on your local machine while you edit data on the cluster directly. Some IDEs/editors are also able to copy files to a cluster.
- Please host the code you produce on the GWDG Gitlab instance `https://gitlab.gwdg.de/` such that your supervisor can inspect your code. You may also include your presentation and report in a Git Repository or even the same as your code.

Task 2: Report

The report should be at most 15 pages without title, listings and appendix, from introduction to conclusion included. The report will account for 100% of your grade. You have to submit any source code you wrote, if any, along with your report. Optimally, the source code should be in a GitLab or GitHub repository.

The report will be graded based on form, whether you provide a good introduction into your topic and the quality of your project work.

You should structure your report along the sample outline provided below. The report must be submitted in PDF format.

2.1 Report Outline

This is a template with an outline for a final project report. Depending on the problem you worked on, this template might not be fully applicable. Adapt it as you see fit.

1. Introduction
    - Brief overview of your topic and motivation
    - Aims and objectives of your project
    - Brief description of your approach
    - Quick summary of your most significant outcomes and their interpretations
    - List of your contributions, what did you create
    - Outline of the report
2. Topic Introduction (Name after your respective topic)
    - Give a more extensive overview of your topic
    - Motivation or requirement that makes your topic relevant
    - What tools and approaches exist
    - Short placement where your own work will fit in
    - Include figures if appropriate
3. Project Plan (Give a name related to what you are going to do)
    - Describe the goal of your project work
    - What is your plan to accomplish that goal?
    - What would a successful outcome look like?
4. Project Results
    - What did you accomplish?
    - Explain your results and outcomes
    - Describe the most relevant technical details
    - Did you accomplish your goal(s)?
    - What problems remain?
    - Include figures and tables
5. Challenges / Discussion
    - Mention the issues and challenges you faced and how you overcame them or if they are actually remaining (you cannot do everything)
    - What would you have done differently?
    - What other options to solving your problem should be mentioned?

6. Conclusion
    - Summarize the problem you set out to solve
    - Include your most important findings
    - Was your project successful?
    - What did you learn?
    - What did you achieve?
7. Appendix
    - Longer code snippets
    - Additional graphs and images

We strongly suggest that you use LaTeX to work on your report but won't enforce it as long as you submit your report in PDF format. The GWDG provides a LaTeX environment *ShareLaTeX* that can be used by all students `https://sharelatex.gwdg.de`. Further, you can find presentation and report templates on our webpage `https://hps.vi4io.org/teaching/ressources/start#templates`.

Finally, submit your report and links to code repositories via email to jonathan.decker@uni-goettingen.de. We would like to publish your results on our webpage, please mention in your submission email whether we may do so or what parts we may publish. You can revoke your consent any time via email and we will take your work down from our webpage. Refusing to let us publish your results has no influence on your grade. Make sure to also mention how many credits you would like to receive for the course.