

NMNV565:
High-Performance Computing for Computational Science
Winter 2020 Syllabus

Instructor: Dr. Erin C. Carson

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Office: Karlín building, 4th Floor

Office Hours: By appointment

Meetings: Friday 09:50-11:20 (lecture), 13:10-14:40 (exercises)

Due to the current pandemic situation, all course lectures and exercises will be held via Zoom.

Course Zoom link: <https://cesnet.zoom.us/j/3389215700>

Course Description: The main goal of the course is to introduce students to concepts and tools for high-performance computing. A special focus will be on aspects of modern supercomputers, including heterogeneous systems, accelerators, and evaluating the time and energy cost of a specific implementation. Students will gain hands-on experience in parallel programming and be introduced to current research challenges.

Grading:

The final grade will be computed with the following weights:

- Labs/Participation – 35%
- Homework/Projects – 35%
- Final Exam – 30%

If taken pass/fail, a grade of 60% is required to pass.

If taken for a numeric grade, the distribution will be the following:

- $\geq 80\%$: 1
- $\geq 70\%$: 2
- $\geq 60\%$: 3
- $< 60\%$: 4

Course Website:

The primary means of communication for this course will be through the course Moodle site:

<https://dl1.cuni.cz/course/view.php?id=10752>. Students should check this site for up-to-date assignments, revised schedule, announcements, lecture material, etc. Homework and Lab submissions will be accepted *only* through Moodle; assignments emailed directly to the instructor will *not* be accepted.

Homework:

There will be 2-3 homework assignments throughout the semester. These are distributed and collected via the Moodle site. Each homework assignment will involve submitting code along with a written report and a README file. For your written report, you must produce an electronic version, preferably in PDF format. You may either use a mathematical typesetting language like LaTeX, a WYSIWYG LaTeX editor like lyx, a standard word processor with equation editor like Microsoft Word.

Late Homework Policy:

- Homework assignments will be accepted up to:
 - **2 weeks late with 10% penalty**
 - **After 2 weeks late with a 30% penalty.**
- No exceptions.
- Note: I recommend submitting your assignment early to avoid any unforeseen last-minute technology or connectivity issues.

Regrade Policy: If you believe you have been graded unfairly, you have one week from when a homework assignment is returned to submit a regrade request to the instructor.

Various Other Homework Policies:

- You are allowed unlimited resubmissions up until the due date.
- You are allowed to work on and discuss problems with your classmates, but you must write up the solutions on your own (see Academic Honesty policy below).

Labs/Participation:

The class meets twice weekly for 90 minutes. Learning high performance computing and parallel programming cannot be done passively; students are expected to be attentive in lectures and follow along with tutorials and activities during exercises. Students are expected to attend class having read the relevant assigned materials. During the exercises, there will usually be some output file (e.g., the result of running a sample program) which the students are to submit as evidence of their completion of the exercises.

Final Exam:

The final exam will be given orally. It will consist of 4 topics for discussion, from which the student must choose 3. A sample list of potential topics will be distributed in advance.

Each exam timeslot is 1 hour. Assignment of students to timeslots will occur during the last week of class.

Academic Honesty and Group Work:

Cheating and plagiarism will be taken seriously. Collaboration is permitted, in fact encouraged, for homework and in-class assignments and activities; however, all submitted reports and code must be written independently and must represent the student's own work and understanding.