

COM 451, Parallel and Distributed Programming

American University of Central Asia
Department of Software Engineering

1 Course Information

Course ID

COM 451, 3708

Course Repository

<https://github.com/auca/com.451>

Class Discussions

<https://piazza.com/class/j6tftykciix26>

Place

AUCA, laboratory G31

Time

Monday 14:10–15:25

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2 Prerequisites

- COM-324, Algorithm Analysis
- COM-341, Operating systems

3 Contact Information

Instructor

Toksaitov Dmitrii Alexandrovich
toksaitov_d@auca.kg

Office

AUCA, room 315

Office Hours

Monday 15:25–17:00

Tuesday 15:25–17:00

Wednesday 10:00–17:00

Thursday 15:25–17:00

Friday 15:25–17:00

4 Course Overview

The course introduces students to the topic of programming multi-core multi-processor systems with data-parallel facilities of various hardware on a single machine or in a distributed system connected to a high-performance network.

5 Topics Covered

- Threading with *pthread*s
- Synchronization
- Data-parallelism with SIMD instructions
- GPGU programming with *OpenCL* and *CUDA*
- Distributed programming with *OpenMPI*

6 Examinations

Students will get midterm and final examinations in the form of two quizzes with multiple choice questions.

7 Course Projects

Throughout the course, students will have to work on three major projects to accelerate programs for image processing, astronomy simulation, and rendering through ray marching.

8 Reading

An Introduction to Parallel Programming by Peter Pacheco (ISBN: 978-0123742605)

9 Grading

- Class participation (through Piazza) (5%)
 - Midterm (15%)
 - Final (20%)
 - Course projects (60%)
- 90%–100%: A
 - 80%–89%: A-

- 70%–79%: B+
- 65%–69%: B
- 60%–64%: B-
- 56%–59%: C+
- 53%–55%: C
- 50%–52%: C-
- 46%–49%: D+
- 43%–45%: D
- 40%–42%: D-
- Less than 39%: F

10 Rules

Students are required to follow the rules of conduct of the Software Engineering Department and American University of Central Asia.

Team work is NOT encouraged. The same blocks of code or similar structural pieces in separate works will be considered as academic dishonesty and all parties will get zero for the task.