**Program**

**The final control on the course** **“Parallel programming”**

**for 2022 – 2023 academic year**

**Faculty**: Information technologies

**Department**: Information Systems

**Cipher and the name of the educational program**: 6B06102 – Information systems

**Name of the discipline**: Parallel programming

**Course**: 3

**Lecturer**: Vladislav Karyukin

**The form of the final control on the academic discipline**: test

**Platform**: LMS Moodle

**Test passing control -** online proctoring.

The proctoring technology *(eng. ”proctor” - to control the course of the exam)*. As in a regular exam in the classroom, Proctors control that the examinees pass the tests honestly. They complete the tasks on their own and do not use additional materials. Both a specialist (face-to-face proctoring) and a program that controls the subject’s desktop, the number of faces in the frame, extraneous sounds or voices, and even eye movements (cyber proctoring) can monitor the online exam in real-time using a webcam. A type of mixed proctoring is often used. A video recording of the exam with the comments of the program is additionally viewed by a person who decides whether violations really took place.

Each student must read and confirm in the chat that he is familiar with the schedule, rules, and instructions for proctoring. Before starting testing, the student must show an identity card. The student must connect to the exam on time, complete the exam without being distracted by extraneous things, without using additional tools and tips from other people.

**Duration of testing**– 60 minutes for 25 questions; 1 attempt.

**Number of test questions–** 25(7 multiple choice + 6 true/false+6 matching +6 missing word choice = 25)

### **EXAM REGULATIONS**

IMPORTANT – the exam is scheduled.

Thirty minutes before the start, students must prepare for the exam in accordance with the requirements of the instructions for proctoring.

### Test results may be reviewed based on the results of proctoring. If a student violates the rules for passing the test, his result will be canceled.

**Topics covered by exam questions (syllabus)**

1. Python in a parallel world
2. Thread-based Parallelism
3. Thread synchronization with Lock and RLock
4. Subclass processes
5. Multiprocessing
6. mpi4py Python module
7. GPU programming with Python
8. Matrix multiplication with PyCUDA
9. NumbaPRO
10. PyOpenCL application

**LIST OF RECOMMENDED LITERATURE**

# Python parallel programming cookbook by Giancarlo Zaccone. Packt publishing, 2015.

# Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance, Sue Blumenberg, Elliott Hauser, Aimee Andrion, 2016.

# Python Cookbook: Recipes for Mastering Python 3 3rd Edition, Kindle Edition by David Beazley, Brian K. Jones, 2013.

# Advanced Python Development: Using Powerful Language Features in Real-World Applications 1st ed. Edition by Matthew Wilkes, 2021.

# Learning Python 5ed: Powerful Object-Oriented Programming, Mark Lutz, 2013.

# Fluent Python: Clear, Concise, and Effective Programming, Luciano Ramalho, 2015.

# Zed Shaw. Learn Python 3 the Hard Way: A Very Simple Introduction to the Terrifyingly Beautiful World of Computers and Code (Zed Shaw's Hard Way Series) 1st Edition.

# Eric Matthes. Python Crash Course: A Hands-On, Project-Based Introduction to Programming 1st Edition.

# Paul Barry. Head First Python: A Brain-Friendly Guide 2nd Edition.

# Dan Bader. Python Tricks: A Buffet of Awesome Python Features

**Evaluation criteria (Rating scale):**

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| --- | --- | --- | --- |
| "Great" - | A | 4.0 | 95-100 |
| A- | 3.67 | 90-94 |
| "Okay" - | B+ | 3.33 | 85-89 |
| V | 3.0 | 80-84 |
| V- | 2.67 | 75-79 |
| C+ | 2.33 | 70-74 |
| "satisfactory" - | WITH | 2.0 | 65-69 |
| WITH- | 1.67 | 60-64 |
| D+ | 1.33 | 55-59 |
| D- | 1.0 | 50-54 |
| "unsatisfactory" - | FX | 0.5 | 25-49 |
| F | 0 | 0-24 |