Quantum Computing for Everyone – Summer School Plan

Goal: Provide an accessible introduction to quantum computing concepts and applications

Target Audience: Beginners, students, professionals curious about quantum computing

Location: Samarkand city, Uzbekistan

Duration: 1 week
(5 study days + 2 free days)
June 9-15, 2025

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Meet Resource Person

Dr. Md. Sazzad Hossain
Professor
Samarkand State University

Website : https://www.professorsazzad.com
Campus website link : https://www.samdu.uz/en
Bio : Dr. Md. Sazzad Hossain is a distinguished Professor at Samarkand State. With over 30 years of experience in higher education, research, and technology consulting, he has emerged as a leading voice in the fields of Quantum Computing, Artificial Intelligence, and Cybersecurity.

Schedule

Day-1	• 9th June, Monday
Day-2	• 10th June, Tuesday
Day-3	• 11th June, Wednesday
Day-4	• 12th June, Thursday
Day-5	• 13th June, Friday
Visiting Day	• 14th June, Saturday
Visiting Day	• 15th June, Sunday

Meet Resource Person

Dr. Akmal Akhatov
Professor
Samarkand State University

Campus website link : **https://www.samdu.uz/en**

Bio : Dr. Akmal Akhatov is a Vice Rector for international cooperation at Samarkand State University. With over 25 years of experience in higher education, research, and technology consulting, he has emerged as a leading sciencetist in the fields of Quantum Computing, Artificial Intelligence, Cybersecurity, Neural Networks, and Big Data.

Dr. Hakim Khushvaktov
Professor
Samarkand State University

Website:
https://www. patent@samdu.uz

Campus website link :
https://www.samdu.uz/en

Bio : Dr. Hakim Khushvaktov Vice-Rector for Scientific Work and Innovation at Samarkand State University. He Samarkand State University. With over 30 years of experience in higher education, research, and technology consulting, he has emerged as a leading sciencetist in the fields of Quantum Computing, Physics and Optics.

Dr. Fayzullo Nazarov
Professor
Samarkand State University

E-mail: fayzulla-samsu@mail.ru

Campus website link : **https://www.samdu.uz/en**

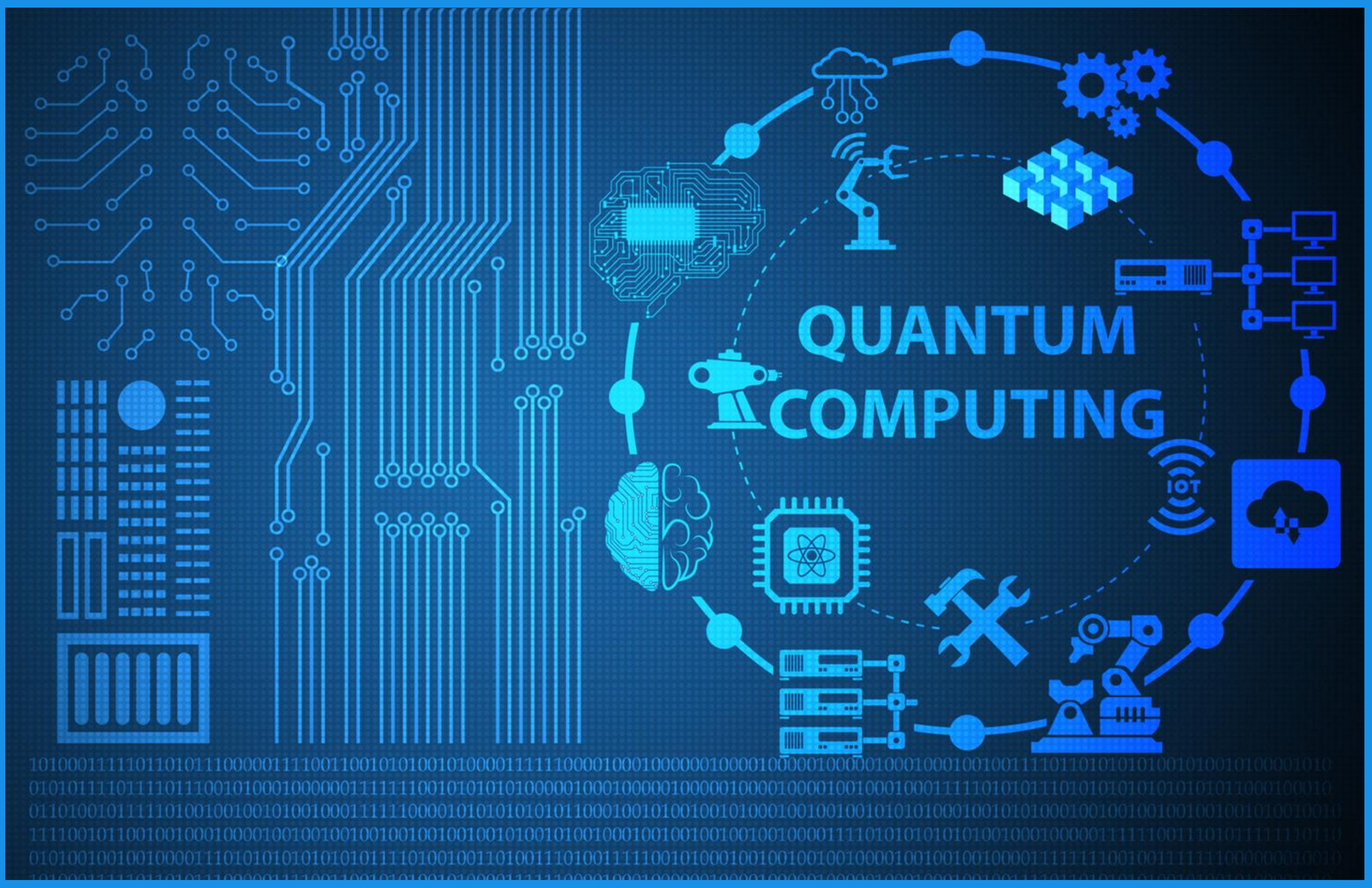
Bio : Dr. Fayzullo Nazarov Dean of the Faculty of Intelligent Systems and Computer Technologies of Samarkand State University. With over 10 years of experience in higher education, research, and technology consulting, he has emerged as a leading sciencetist in the fields of Computer Science, Artificial Intelligence, Neural Networks, and Big Data.

Mr. Nodir Rabimov
PhD Researcher

Website:
https://www.nodirrabimov.com

Campus website link :
https://www.samdu.uz/en

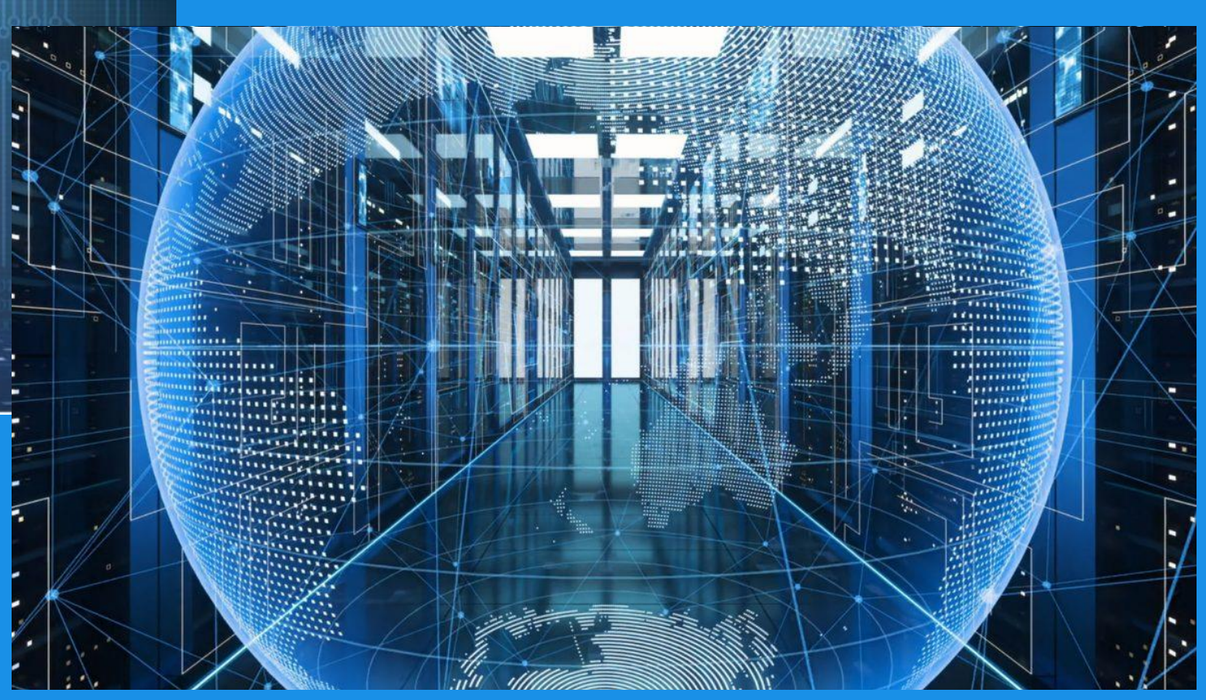
Bio : Nodir Rabimov is a dedicated PhD researcher at Samarkand State University. He completed both his Bachelor’s and Master’s degrees at Samarkand State University. He also worked as a teacher at the Uzbek-Finnish Pedagogical Institute and completed academic internships in Finland. His current research focuses on Quantum Algorithms and Machine Learning, especially in the context of optimizing data processing and labor relations. Nodir is actively contributing to the future of Artificial Intelligence, Quantum Computing, and Automation.



Study Plan (Monday – Friday)

Daily Schedule:

- 10:00 – 12:00 → Lesson 1 (Theory & Concepts)
- 12:00 – 14:00 → Lunch & Networking
- 14:00 – 16:00 → Lesson 2 (Hands-on & Discussions)
- 16:00 – 17:00 → Q&A, Office Hours, or Free Study Time



Day 1: Foundations of Quantum Computing

Lesson 1: Introduction to Quantum Computing

- Why Quantum? Classical vs. Quantum Computing
- Fundamental Concepts: Superposition & Entanglement

Lesson 2: Qubits & Quantum Gates

- Understanding Qubits & Bloch Sphere
- Basic Quantum Gates (X, Y, Z, H, CNOT)

Hands-on: Simulating a Qubit with Qiskit

Day 2: Quantum Circuits & Basic Algorithms

Lesson 1: Quantum Circuits & Operations

- How Quantum Circuits Work
- Measurement & Probabilities in Quantum Systems

Lesson 2: Deutsch-Jozsa Algorithm

- One of the First Quantum Speedup Algorithms
- Understanding & Implementing It

Hands-on: Running the Deutsch-Jozsa Algorithm in a Quantum Simulator

Day 3: Quantum Algorithms in Action

Lesson 1: Grover's Algorithm (Quantum Search)

- The Power of Quadratic Speedup
- How It Works & Why It's Important

Lesson 2: Shor's Algorithm (Breaking RSA Encryption)

- Factoring Large Numbers with Quantum Power
- Implications for Cybersecurity

Hands-on: Implementing Grover's Algorithm in Python

Day 4: Real-World Quantum Computing & Challenges

Lesson 1: Quantum Hardware & Noisy Intermediate-Scale Quantum (NISQ) Computers

- How Quantum Computers Are Built
- The Challenges of Real-World Quantum Systems

Lesson 2: Quantum Error Correction & Future Trends

- Quantum Decoherence & Error Mitigation
- Where Quantum Computing is Headed

Hands-on: Running Circuits on Real Quantum Hardware (IBM Quantum)

Day 5: Industry Applications & Project Presentations

Lesson 1: Real-World Applications of Quantum Computing

- Quantum Finance, Healthcare, and AI
- Industry Case Studies

Lesson 2: Group Presentations & Certification Ceremony

- Small Team Projects (Mini Quantum Apps)
- Final Discussions & Closing Remarks

Guest Lecture from a Quantum Computing Expert (Optional)

Cultural Exploration (Saturday – Sunday)

Saturday: Historic Samarkand Tour

- Registan Square – Iconic Timurid Architecture
- Bibi-Khanym Mosque – Once the Largest Mosque in the World
- Siyob Bazaar – Local Culture, Spices, and Handicrafts
- Shah-i-Zinda Necropolis – Stunning Ancient Mausoleums

Sunday: Leisure & Nature

- Option 1: Afrosiab Museum & Ancient Ruins
- Option 2: Day trip to the mountains
- Option 3: Relaxing day for shopping and café hopping

Educational Buildings of Samarkand State University

Rectorate and International Education Center

HISTORY OF SAMARKAND STATE UNIVERSITY

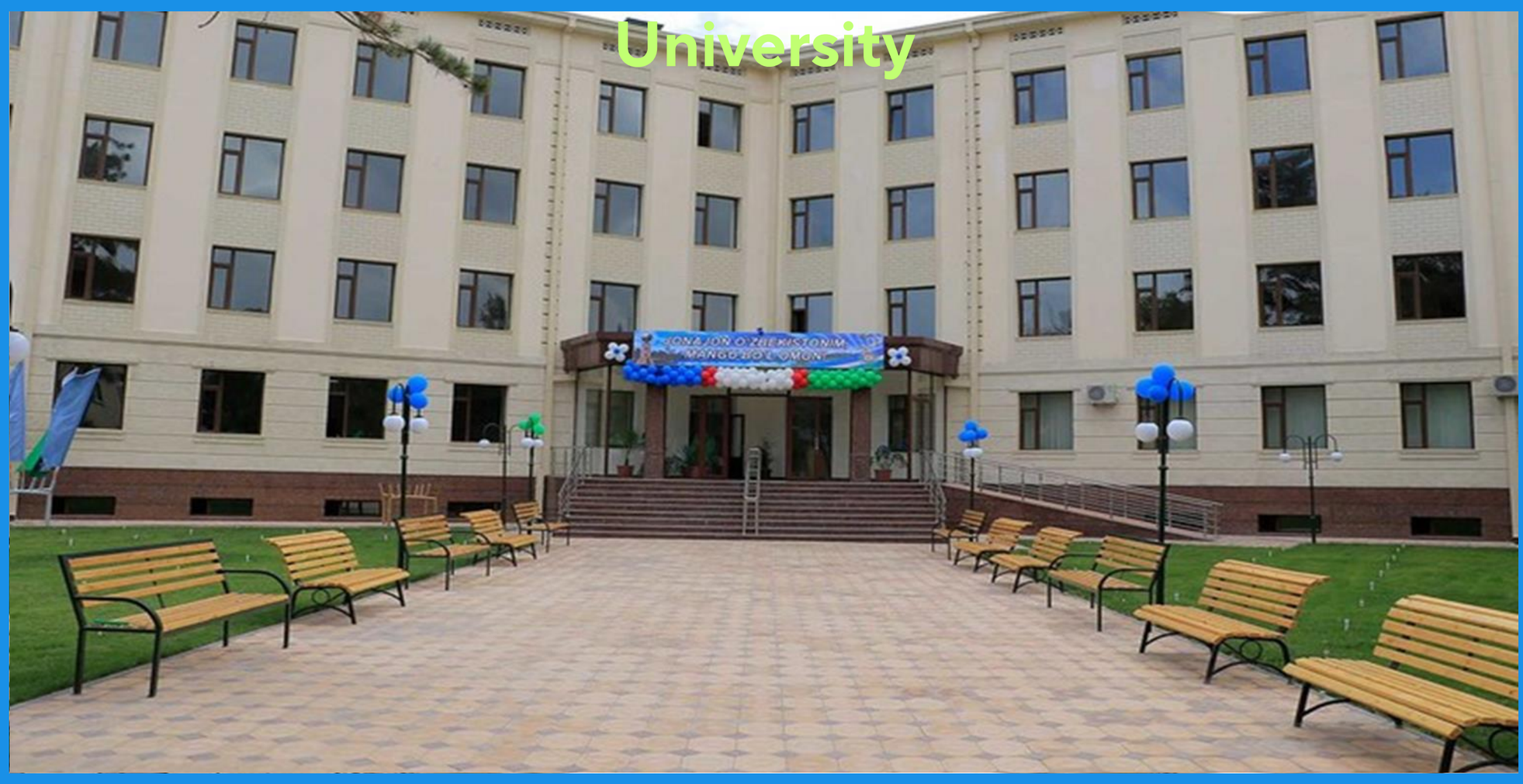
Institute of Engineering Physics

The main building of the university

Institute of Biochemistry

Student’s accommodation

Hotels and Accommodations of University



Branches of the university library, the "Strategy of Actions" room, the "Five Initiatives" room, the "Student Council" room and clubs for students' free time are operating in the student residences.

IT CENTER of Samarkand State University

Graphics and design room

Robotics room

Programming Center

2025 International Summer School

Key Details:

We are pleased to announce the 2025 International Summer School, an offline program featuring one-week modules from June 09-15, 2025, at the Samarkand State University. This offline program offers a diverse range of courses delivered by our expert faculty, catering to undergraduate, postgraduate, and PhD students—exclusively for international participants.

Registration fee: USD 150.
Certificate of Participation will be awarded upon successful completion of the program.

International Summer School Participant Form

Through this form, you can apply to International Summer School at Samarkand State University, Uzbekistan.

First name/ Имя _____

Last name/ Фамиля

Midle name / Отчество _____

Country/ Страна _____

Citizenship/ Гражданство _____

Email/ Электронная почта_____

Passport ID (*number*)/ Номер паспорта _____

Language/ Язык _____

Specification / Спецификация _____

Phone number/ Номер телефона _____ -----_____

Telegram number or user name/ Номер или имя пользователя в Telegram _____

WhatsApp number/ Номер WhatsApp _____

Contact us/ Связаться с нами: irossu1420@gmail.com