

COURSE CERTIFICATE

№ 02BIOENG-0222-1

Date of issue 27/12/2022

This is to certify that

Выдревич Григорий Михайлович

Successfully completed the course

INTRODUCTION TO BIOMEDICAL ENGINEERING

2 credits

The description of the course and the achieved learning results are given in the appendix to this certificate.

E-CERTIFICATE

<https://open.spbstu.ru/certificate/02BIOENG-0222-1.pdf>



Vice-rector for academic affairs
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STUDENT ID 3049976

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<http://www.spbstu.ru/>

THE NAME OF THE COURSE INTRODUCTION TO BIOMEDICAL ENGINEERING
<https://openedu.ru/course/spbstu/BIOENG/>

LEAD-TIME

From October 31, 2022 to December 25, 2022

Assessment, number of hours and credits per course

Credits	Hours		Assessment		
	General	Academic	100-point	5-point	Letter
2	54	72	90	5	A

GRADING POLICY

Evaluation scale ranges (100-point scale)	Score (5-point scale)	Letter
85-100	5	A
70-84	4	B
60-69	3	C
0-59	2	F

COURSE PROGRAM

Module 1. Electronics

- Lesson 1.1 Introduction
- Lesson 1.2 Basics of Engineering Electronics
- Lesson 1.3. Amplifiers
- Lesson 1.4 Filters

Module 2. Control theory

- Lesson 2.1 Introduction to the control theory
- Lesson 2.2 1st and 2nd order systems analysis
- Lesson 2.3 PID controller

Module 3. Real-time Embedded Systems (Arduino)

- Lesson 3.1 Basics of coding for digital controlled
- Lesson 3.2 System components and hardware
- Lesson 3.3 PID controller

Module 4. High-level programming and complex control (MATLAB)

- Lesson 4.1 Basics of coding in MATLAB
- Lesson 4.2 Serial interface and filters
- Lesson 4.3 Closed-loop control of bionic prosthetics

WHAT YOU'LL LEARN:

- How to design and analyse the electronics related to the weak signal acquisition, particularly electrophysiology.
- How to analyse electro-mechanical systems and design the closed-loop controllers for them.
- How to code in Arduino for real-time control applications.
- How to code in MATLAB for advanced signal processing.

SCORING FORMULA:

Nº	Assessment Type	Points scored	Maximum score	Quotient
1	Test	100	100	0,20
2	Practical Task	100	100	0,30
3	Final Coursework	80	100	0,30
4	Final Test	80	100	0,20
5	Final Score	90	100	1

Appendix to the certificate №
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