International Polytechnic SUMMER & WINTER SCHOOLS

POLYTECH Peter the Great St.Petersburg Polytechnic University

Microelectronics and Bioengineering

Version **Effective from (date of when the course was developed)**	2022/1 01/04/2022

ECTS Credits	5
Level/Year	Bachelor (after 2nd semester), Master and PhD students
Teaching (contact) hours	54
Total learner managed hours (incl. self-work)	126
Total hours of student learning	180

Pre-requisites	Knowledge of Calculus and General Physics corresponding to the first two years of a Bachelor's degree program in science, technology, engineering, mathematics. Good command of English. All classes and extracurricular activities are conducted in English.
Co-requisites	None
Alignment to graduate profiles	This course contributes to achievement of the graduate outcomes of the following qualifications: • Bachelor of Physics, Technology, or Engineering • Master of Physics, Technology, or Engineering • Graduate Diploma in Physics, Technology, or Engineering • Diploma in Physics, Technology, or Engineering
Course aim	The main objective of the program is to improve knowledge and skills, increase the competitiveness of specialists in the labor market in the field of research and design in the field of electronics and bioengineering.
Indicative Course content	Digital design with Verilog HDL ;LabVIEW Measuring automatization based on LabView; Physical Processing Simulation on ANSYS; Microelectronics Circuits Computer Simulation; Materials for Bioengineering and organic Electronics; Devices and Technologies of Organic Electronics; applications of techniques and methods discussed to the field of bioengineering.

LEARNING OUTCOMES

On successful completion of this course students will be able to:	
1	Have an understanding of current trends in digital engineering in electronics and bioengineering
2	Know the basics of digital device development, the basics of measurement automation
3	Know physical basics of materials science, basics of modelling of physical processes
4	Know fundamentals of computer modelling of devices
5	Be able to apply the knowledge gained for the programming of digital devices, work in LabView environment, simulation of physical processes in ANSYS, simulation of microelectronic devices in MicroCap

ASSESSMENTS

Basis of assessment	**Achievement based assessment**

Methods of assessment	Learning Outcomes	Pass criteria (Minimum)	% Weightings
Summative review	3	40%	40
Portfolio – summative of practices	1,2,4,5	40%	60

REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

Requirements	**Mark of 40% or more in every summative assessment**

RESULTS

Assessment results	**Results for assessments are given in percentage marks**
Course results	**• Individual assessments may cover one or more of the learning outcomes. • Each summative assessment is assigned a percentage weighting. • The overall percentage mark for the course is calculated by adding the weighted results for all summative assessments**

LEARNING AND TEACHING

Learning and teaching approaches	**Lectures, seminars and group discussions, learner managed activities, distant laboratories.**
Learning and teaching resources	Textbooks, journals and library resources; use of Internet; computer software.
Learner managed activities	**Completion of course work, set assignments • Reading of course materials • Study group work • Preparation for classes • Practicing relevant skills/methods/techniques • Self-evaluation of course work • Gathering relevant contextual information/ issues/ideas to build knowledge of the subject**