International Polytechnic SUMMER & WINTER SCHOOLS

POLYTECH Peter the Great St.Petersburg Polytechnic University

PolyPhotonics

Version **Effective from (date of when the course was developed)**	2017-03

ECTS Credits	3
Level/Year	3
Teaching (contact) hours	40
Total learner managed hours (incl. self-work)	95
Total hours of student learning	135

Pre-requisites	Physics (electromagnetic theory), optics (basics), Spectroscopy (basics)
Co-requisites	None
Alignment to graduate profiles	Basic knowledge of physics. At least 3 years of University level studies (physics-connected directions) Fluent English
Course aim	The program aims to provide advanced techniques of basic principles of optics and photonics in a number of applications such as communication, biology and medicine, quantum computing, holography. Within the school, students will have the opportunity to develop their own projects under the guidance of specialists in telecommunications, optical systems, biophotonics and fiber optics
Indicative Course content	Optics in telecommunications technology, Fiber optics, Biomedical optics, Calculations in optics, Quantum optics, Image processing.

LEARNING OUTCOMES

On successful completion of this course students will be able to:	
1	Design fiber-optical communication line,
2	Analise material based on its spectrum,
3	Develop system of optical sensors,
4	Apply their knowledge in experimental tasks,
5	Understand principles of quantum computing and cryptography

ASSESSMENTS

Basis of assessment	Achievement based assessment		
Methods of assessment	**Learning Outcomes**	**Pass criteria (Minimum)**	**% Weightings**
Final project presentation	Max score 80	40	50
Portfolio – summative of practices	Max score 20	10	50

REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

Requirements	Attend at least half lectures and practices. Successfully present final project

RESULTS

Assessment results	Results for assessments are given in points marks
Course results	Develop project under the guidance of specialists in telecommunications, biophotonics, image processing and fiber optics. The development of the project consist of both the theoretical part (the schematic part and the corresponding calculations), and the practical part where students present device.

LEARNING AND TEACHING

Learning and teaching approaches	Active learning, Collaborative learning, Problem-based learning, Interdisciplinary learning
Learning and teaching resources	Textbooks, journals and library resources; use of Internet; computer software Software requirements: MS Teams (free access will be provided for all students), Anaconda (free program), COMSOL (advisable for additional course on Tuesday 07), GLAD (advisable), Microsoft Office 2007 or newer, alternative: LibreOffice—a free productivity suite compatible with Microsoft Office file formats.
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