International Polytechnic SUMMER & WINTER SCHOOLS

POLYTECH Peter the Great St.Petersburg Polytechnic University

Cyber Systems Technology

Version **Effective from (date of when the course was developed)**	2020/1 06/05/2019

Course Credits given	4 ECTS
Level/Year	Bachelor, Master and PhD students
Teaching (contact) hours	48
Total learner managed hours (incl. self-work)	96
Total hours of student learning	144

Pre-requisites	Preferably students from the third year of bachelor's degree, graduate students, persons with a bachelor's or master's degree. Knowledge of general technical disciplines is desirable. The direction of basic training is desirable for an engineering and technical profile, but it is also possible to receive students who want to acquire knowledge in a completely new field for themselves.
Co-requisites	None
Alignment to graduate profiles	This programme contributes to achievement of the graduate outcomes of the following qualifications: • Bachelor of Information Technology/Control Systems • Graduate Diploma in Information Technology/Control Systems • Diploma in Information Technology/Control Systems
Course aim	The programme includes fundamental and applied aspects of research in the field of intelligent robotics and control systems; development of innovative technologies and software and hardware solutions for industrial automation tasks and high-tech industrial control systems. Students analyse the interactive environment of cyber-physical and robotic systems, create new solutions and mathematical models in the field of intelligent robotics and control systems. Teams of students study and demonstrate technologies for remote control of industrial facilities, group behaviour control of collaborative robots and situational control under conditions of uncertainty within the framework of applied developments.
Indicative Course content	Content may include but is not limited to: • Industrial Computers • Industrial Networks, Fieldbuses, Process Controllers and Simulators • Modern Programming Languages and Tools for Industrial Automation • Multi-agent systems development

LEARNING OUTCOMES

On successful completion of this course students will be able to:	
1	To understand of modern digital production tools; about software that allows solving practical problems of intelligent production systems
2	To know modern information technologies used in science and industry; hardware and software complexes and systems used in CPS; modern trends in the development of electronics, measuring technology and information technology
3	To choose, to create complexes and to operate software and hardware in the created computing and information systems and network structures; to set and solve circuit problems related to the choice of a system of elements for given requirements for the parameters of cyber-physical systems; to install, test and use the software and hardware of the computing and information

	systems of the CPS.

ASSESSMENTS

Basis of assessment	Achievement based assessment

Methods of assessment	**Learning Outcomes**	**Pass criteria (Minimum)**	**% Weightings**
Summative review	1, 2	50%	40%
Summative of project work	3	50%	60%

REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

Requirements	• Mark of 50% or more in every summative assessment • Gain a course result of 50% or higher

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, group discussions, tutorials, learner managed activities, laboratories, presentations, research, projects and case studies.
Learning and teaching resources	Textbooks, journals and manuals; use of Internet; laboratory and specialist software: • Intelligent robotics and cyber-physical systems • Intelligent control systems • Intelligent systems of industrial automation
Learner managed activities	• Completion of course work, set assignments/projects • Reading of course materials • Study group work • Preparation for classes • Homework • Research • Discussions with colleagues/subject matter experts • Review application of information to project work • Practising relevant practical and technical skills/methods/techniques • Presentation and self-evaluation of project work • Gathering relevant contextual information/ issues/ideas to build knowledge of the subject