

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Parallel and Distributed Systems</b>		Code <b>1010331471010337139</b>
Field of study <b>Computer Science</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>4 / 7</b>
Elective path/specialty <b>Safety of Computer Systems</b>	Subject offered in: <b>polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>1</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>2</b>		No. of credits <b>4</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Krzysztof Bucholc email: krzysztof.bucholc@put.poznan.pl tel. +48 61 665 3531 Wydział Elektryczny ul. Piotrowo 3A 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student has an ordered and well-based in theory, knowledge of basic algorithms and their analysis, design techniques, abstract data structures and their implementation, computationally difficult problems. - K_W04
2	<b>Skills</b>	Student is able to self learning in order to increase professional skills - K_U05
3	<b>Social competencies</b>	Student understands the need and knows possibilities of constant training oneself of raising linguistic, professional, personal and social competence. - K_K01
<b>Assumptions and objectives of the course:</b> The aim of this course is to present basic ideas of distributed and parallel systems. We will focus on exploiting parallelism of modern computer systems and writing programs for parallel and distributed computation.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b> 1. Student is knowledgeable with the state of art and modern trends in software engineering and computing - [K_W19]		
<b>Skills:</b> 1. Student is able to evaluate the usefulness of routine methods and tools for solving simple tasks typical of engineering informatics and select and apply appropriate technologies. - [K_U22] 2. Student can by herself/himself acquire knowledge from the literature, databases and other sources; can also integrate the acquired knowledge, - [K_U01]		
<b>Social competencies:</b> 1. Student is aware of an importance of a precise implementation of a software product, using the design standards, and preparing the correct documentation - [-]		
<b>Assessment methods of study outcomes</b>		
Lecture: test Project assessment		
<b>Course description</b>		

Architecture of parallel systems. Models of parallel computation. Performance of parallel computations. Automatic parallelization and its limits. Programming with OMP. Massive parallel processing. Programming using OpenCL, CUDA, and Open ACC. Computing in message passing systems. Programming using MPI.		
<b>Basic bibliography:</b>		
1. Programowanie równoległe i rozproszone, A. Karbowski (red.), Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2009.		
2. Foster I., Designing and Building Parallel Programs, książka dostępna w Internecie <a href="http://www-unix.mcs.anl.gov/dbpp">http://www-unix.mcs.anl.gov/dbpp</a> .		
3. Systemy rozproszone. Zasady i paradygmaty, Tanenbaum A.S., Steen M. van, Wyd. Naukowo-Techniczne, Warszawa, 2006.		
<b>Additional bibliography:</b>		
1. B.,Chapman, G., Jost, R. van der Pas, Using OpenMP, Portable Shared Memory Parallel Programming, The MIT Press, 2008.		
2. R., Tsuchiyama and al., The OpenCL Programming Book, Fixstars Corporation, 2009.		
3. D., Kirk, W., Hwu, Programming Massively Parallel Processors, Morgan Kaufmann, 2010.		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Lecture	15	
2. Project - classes	30	
3. Project preparation	40	
4. Preparation for final test	15	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	100	4
Contact hours	45	2
Practical activities	70	3