

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Parallel and distributed systems		Code 1010331571010337139
Field of study Information Engineering	Profile of study (general academic, practical) general academic	Year /Semester 4 / 7
Elective path/specialty Security of Information Technology (IT)	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: 15 Project/seminars: -		No. of credits 3
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 3 100% 3 100%
Responsible for subject / lecturer: dr inż. Krzysztof Bucholc email: krzysztof.bucholc@put.poznan.pl tel. +48 61 665 3531 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Knowledge 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	Skills	Skills Student is able to self learning in order to increase professional skills - K_U05
3	Social competencies	Social competencies Student understands the need and knows possibilities of constant training oneself of raising linguistic, professional, personal and social competence. - K_K01
Assumptions and objectives of the course: 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.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Student is knowledgeable with the state of art and modern trends in software engineering and computing - [K_W19] - [-]		
Skills: 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] - [-]		
Social competencies: 1. Student is aware of an importance of a precise implementation of a software product, using the design standards, and preparing the correct documentation - [-]		
Assessment methods of study outcomes		
Lecture: test Project assessment		
Course description		

<p>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.</p> <p>Laboratory: Programming using OMP. Programming using MPI. OMP and MPI. Distributed applications.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 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 http://www.mcs.anl.gov/~itf/dbpp/. 3. Systemy rozproszone. Zasady i paradygmaty, Tanenbaum A.S., Steen M. van, Wyd. Naukowo-Techniczne, Warszawa, 2006. 4. Czech Z., Wprowadzenie do obliczeń równoległych, PWN, Warszawa, 2010. 5. Orłowski Sł., C# Tworzenie aplikacji sieciowych, Helion, 2007. 6. Quinn M., J., Parallel Programming in C with MPI and OpenMP, MC Graw Hill Higher Education, 2004. 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 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. 		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
1. . Lecture		15
2. Project - classes		30
3. Project preparation		40
4. Preparation for final test		15
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
Total workload	90	3
Contact hours	45	2
Practical activities	75	3