1.	Field of study	Materials Science and Engineering
2.	Academic year of entry	2018/2019 (summer term)
3.	Level of qualifications/degree	second-cycle studies
4.	Degree profile	general academic
5.	Mode of study	full-time

Module: Computer networks and their use in materials engineering

Module code: IM2A_SIECI

1. Number of the ECTS credits: 3

2. Learning outcomes of the module

code	description	learning outcomes of the programme	level of competence (scale 1-5)
IM2A_SIECI_1	Students have basic knowledge of computer networks, comprising: network design and computer networks classification; protocols role and organisation in the data transmission; the role of routing and DNS services. Students know the rules of server resources management, including: user account and account groups handling and making the disk resources and printers available in a computer network.	IM2A_W04	5
IM2A_SIECI_2	Students have basic knowledge about using and managing computers operating under the Unix system, comprising: the configuration of Bash shell environment; basic data processing commands; issues of data processing automation by means of batch programs (scripts) in the Bash shell environment. They understand principles of computer cluster structure, configuration and management to support research in the field of materials science. Students know procedures to configure password-free communication with the use of SSH protocol and to implement an IT environment for parallel computations.	IM2A_W04 IM2A_W15	5 4
IM2A_SIECI_3	Students can build and configure a local computer network in accordance with the provided specification and can manage resources of a Windows server, in accordance with the provided specification. On a basic level they can manage basic resources of a server operating under the Unix system. They can design and write a batch program in the Bash shell environment of the Unix system in accordance with the specified objective.	IM2A_U02 IM2A_U06	5 5
IM2A_SIECI_4	Students can implement a password-free communication (SSH) between Unix servers in a computer cluster and configure the environment for parallel computations with the use of protocol (MPI).	IM2A_U06	5
IM2A_SIECI_5	Students are aware of responsibility for own work and readiness to submit to team work rules and to bear responsibility for tasks implemented together. They understand the need to formulate and to provide information on computer networks applications in the area of materials engineering.	IM2A_K03 IM2A_K06	3 3

3. Module description	
Description	The module Computer networks and their use in materials engineering shall enable that students are knowledgeable about issues of organisation, design, configuration of local computer networks; management of local networks and server resources; organisation of computer clusters for applications in materials modelling. Owing to that students shall achieve a better understanding of problems in the field of: computer operation in a computer network; rules and procedures for data protection on servers; organisation and management of computer clusters The understanding of principles and procedures for server management and network organisation shall result in deepening the skill of computer network use for information processing and in carrying out advanced parallel computations in the area of engineering materials computer modelling.
Prerequisites	Passive command of English language. Proficiency in a PC operation in the basic scope and a general knowledge of a PC structure. Knowledge of a binary number system.

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
IM2A_SIECI_w_1	Practical test	Verification of the knowledge based on the lectures content, recommended literature and attended classes.	IM2A_SIECI_1, IM2A_SIECI_2, IM2A_SIECI_3, IM2A_SIECI_4, IM2A_SIECI_5
IM2A_SIECI_w_3	Test	Assessment of mastering the basic knowledge necessary for individual performance of a practical exercise.	IM2A_SIECI_1, IM2A_SIECI_2, IM2A_SIECI_3, IM2A_SIECI_4, IM2A_SIECI_5
IM2A_SIECI_w_4	Sprawozdanie	Assessment of the skill to understand mechanisms of a computer network operation in materials engineering laboratory applications by correct formulation of conclusions.	IM2A_SIECI_1, IM2A_SIECI_2, IM2A_SIECI_3, IM2A_SIECI_4, IM2A_SIECI_5

5. Forms of teaching

code	form of teaching			required hours of student's own work		assessment of the learning outcomes of the module
	type	description (including teaching methods)	number of hours	description	number of hours	
IM2A_ SIECI _fs_3	laboratory classes	Application of the acquired theoretical knowledge to practical implementation of tasks related to configuration and management of servers, local networks and computer clusters. Exercises are performed by students individually/in teams with the use	30	Preparation of theoretical basics and issues related to the topic of performed exercise. Independent preparation of a theoretical introduction. Individual preparation of exercise results.	30	IM2A_SIECI_w_1, IM2A_SIECI_w_3, IM2A_SIECI_w_4

		of teaching laboratories equipment.				
IM2A_SIECI_fs_1	lecture	The lecture shall enable understanding issues related to computer networks operation and rules and procedures for a server and a local network management, enabling an active use of computer networks in a materials engineering laboratory. The lecture is delivered with the use of multimedia and demonstrations.	15	The work with the recommended literature comprising independent acquisition of knowledge related to basic issues.	20	IM2A_SIECI_w_1