1.	Field of study	Computer Science
2.	Academic year of entry	2017/2018 (summer term), 2018/2019 (summer term)
3.	Level of qualifications/degree	second-cycle studies
4.	Degree profile	general academic
5.	Mode of study	full-time

Module: General-Purpose computing on Graphics Processing Units

Module code: 08-IN-GWK-S2-PKG

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)
PKG -K_7	Can work individually or in a team, understands the meaning of intellectual honesty in his own and others activities, acts ethically. Understands the need of constant improving his competences.	K_2_A_I_K01 K_2_A_I_K03 K_2_A_I_K04	1 1 1
PKG -K_8	Can think creatively, formulate opinions about basic issues, current state and developmental trends in IT and understands non-technical issues of professional activities.	K_2_A_I_K02 K_2_A_I_K05 K_2_A_I_K06	1 1 1
PKG -U_4	Can estimate time and memory complexity of parallel algorithms, can transform the chosen sequential algorithms into parallel ones, knows and understands problems connected with processing parallel calculations.	K_2_A_I_U13 K_2_A_I_U14	1 1
PKG -U_5	Can design a parallel algorithm structure, understands properties of parallel algorithms, their limitations and knows tasks scheduling mechanisms.	K_2_A_I_U14 K_2_A_I_U20 K_2_A_I_U21	1 1 1
PKG -U_6	Can develop software taking advantage of CUDA C, Thrust, DirectCompute or OpenCL. Can use literature resources and skillfully interpret acquired information.	K_2_A_I_U01 K_2_A_I_U02 K_2_A_I_U03 K_2_A_I_U05 K_2_A_I_U06 K_2_A_I_U14	1 1 1 1 1 1
PKG -W_2	Knows properties of parallel algorithms, understands techniques of computational parallelization at the instruction level, data and	K_2_A_I_W01	1

	tasks.	K_2_A_I_W09	1
PKG -W_3	Knows principles of programming GPU processors using CUDA C and Thrust C++ library, knows and understands functionality of DirectCompute library and OpenCL language in parallel processing. Understands trends in IT development and methods of software engineering.	K_2_A_I_W06 K_2_A_I_W07 K_2_A_I_W14	1 1 1
PKG-W_1	Knows hardware architecture of GPU processors and graphic cards, knows mechanisms and communication structures CPU-GPU.	K_2_A_I_W04	1

3. Module description	
Description	Aim of the subject is making the student familiar with parallel computing technique on GPU graphic processors. The course covers basics of C++, DirectCompute and OpenCL together with hardware aspects of graphic cards calculations.
Prerequisites	

4. Assessment of the learning outcomes of the module

code	type	description	learning outcomes of the module
PKG _w_1	Reports	Systematic execution of the laboratory works course connected with the executed project.	PKG -K_7, PKG -K_8, PKG -U_4, PKG -U_5, PKG -U_6
PKG _w_2	Project	Executing a semester project in the range of educational effects accepted in the module.	PKG -K_7, PKG -K_8, PKG -U_4, PKG -U_5, PKG -U_6, PKG -W_2, PKG -W_3, PKG-W_1
PKG _w_3	Presentation	Giving audio-visual presentation in front of the group, discussing assumptions and accepted method of specific problem solution, analysis and evaluation of the project goal.	PKG -K_7, PKG -K_8

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	
PKG _fs_1	lecture	Presenting educational content with use of audio-visual aids.	15	Individual studying of lectures subject matter and advised literature.	5	PKG _w_1, PKG _w_2, PKG _w_3
PKG _fs_2	laboratory classes	Practical realization of the educational content, consisting on, among others, acquiring the skill and experience in efficient use of CUDA C, Thrust, DirectCompute or OpenCL libraries. The classes are held using computer stations and appropriate software.	30	Individual preparation for laboratory classes and periodical reports of project works proceedings. Systematic execution of reports of project works proceedings. Individual or in several person group, execution of the project and its documentation.	40	PKG _w_1, PKG _w_2, PKG _w_3

				Preparing an audio-visual presentation about executed project and presenting it in front of the group.		