

| STUDY MODULE DESCRIPTION FORM | | |
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| Name of the module/subject Concurrent programming | | Code 1010334551010335200 |
| Field of study Information Engineering | Profile of study (general academic, practical) (brak) | Year /Semester 3 / 5 |
| Elective path/specialty - | Subject offered in: Polish | Course (compulsory, elective) elective |
| Cycle of study: First-cycle studies | Form of study (full-time, part-time) part-time | |
| No. of hours Lecture: 16 Classes: - Laboratory: 12 Project/seminars: - | | No. of credits 4 |
| Status of the course in the study program (Basic, major, other) (brak) | | (university-wide, from another field) (brak) |
| Education areas and fields of science and art technical sciences Technical sciences | | ECTS distribution (number and %) 4 100% 4 100% |
| Responsible for subject / lecturer: dr inż. Krzysztof Zwierzyński email: Krzysztof.Zwierzynski@put.poznan.pl tel. +48 61 665 3755 Faculty of Electrical Engineering ul. Piotrowo 3A 60-965 Poznań | | |
| Prerequisites in terms of knowledge, skills and social competencies: | | |
| 1 | Knowledge | Mathematics in the basics of matrix calculus, linear algebra. Basic knowledge of object-oriented programming, using the Windows API, the basics of UNIX. Knowledge and understanding of the basic concepts of programming |
| 2 | Skills | Ability to programming in object-oriented language. Design and analysis of algorithms for combinatorial including sorting and processing base graphs. solve simple tasks in the field of mathematical analysis. |
| 3 | Social competencies | Conscientiousness in communicating the results of laboratories. |
| Assumptions and objectives of the course: Skills in the concurrent programming | | |
| Study outcomes and reference to the educational results for a field of study | | |
| Knowledge: | | |
| 1. The student is versed in the current state, and the latest development trends of computer science - [K_W19] | | |
| Skills: | | |
| 1. The student can make critical analysis of how computer hardware, operating system (or parts thereof) and computer networks operate - [K_U11] | | |
| Social competencies: | | |
| 1. The student is aware of the importance and understanding of the non-technical aspects and effects of the activity of the IT engineer and the associated responsibility for the decisions made. - [K_K02] | | |
| Assessment methods of study outcomes | | |
| Assignments, reports from laboratories | | |
| Course description | | |

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| <p>Programming in languages: C, C++, ADA, Java. Memory models, synchronization, avoiding race conditions and deadlocks. Overhead time associated with concurrency. Programming in OpenMP, OpenCL, CUDA. Concurrent code optimization. Update 2017: Kepler Project, PN Director (Process Network)</p> | | |
| <p>Basic bibliography: 1. Mordechai Ben-Ari, Podstawy programowania współbieżnego i rozproszonego, Wydawnictwa Naukowo-Techniczne, Warszawa 2009. 2. Michael McCool, James Reinders, Arch Robison, Structured Parallel Programming: Patterns for Efficient Computation, 2013. 3. Michel Raynal, Concurrent programming : algorithms, principles, and foundations, Springer, 2013. (w bibliotece PP)</p> | | |
| <p>Additional bibliography: 1. Maurice Herlihy, Nir Shavit, Sztuka programowania wieloprocesorowego, Wydawnictwo Naukowe PWN, Warszawa 2010.</p> | | |
| <p>Result of average student's workload</p> | | |
| <p>Activity</p> | | <p>Time (working hours)</p> |
| <p>1. Participation in lectures, preparation of programs for laboratory classes and individual work with manual</p> | | <p>70</p> |
| <p>Student's workload</p> | | |
| <p>Source of workload</p> | <p>hours</p> | <p>ECTS</p> |
| Total workload | 100 | 4 |
| Contact hours | 30 | 2 |
| Practical activities | 50 | 2 |