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| The title of the course | **Parallel and Distributed Computing** |
| Faculty | [Faculty of Mechanical Engineering and Computer Science](http://eng.ath.bielsko.pl/index.php/faculties/gerg) |
| The level of studies | Undergraduate (BA)  Postgraduate (MA)  Engineer (BSc) |
| Semester | Winter |
| The form of classes and number of hours | Laboratory/Project (15h/30h) |
| Language of instruction | English |
| The number of ECTS | 3 |
| Teacher | Krzysztof Augustynek, PhD |
| The aims of the course | The students will learn the basics of process management, communication between two or more related or interrelated processes. They will also acquire basic knowledge of thread management and synchronization of tasks in parallel applications. The students attending this course are expected to have basic skills in C programming language. |
| The content of the course: main topics and key ideas | 1. Process management 2. Named and unnamed pipes 3. Message queues 4. Threads 5. Synchronization with using mutex 6. Message Passing Interface (MPI) |
| Didactics methods | multimedia presentation |
| Course requirements | Exam, attendance |
| Literature (basic and supplementary) | * Ben-Ari M.: Principles of Concurrent and Distributed Programming, Pearson; 2 edition, 2009. * Hughes C., Hughes T.: Parallel and distributed programming using C++, Addison-Wesley, Boston 2003. * Grama A., Gupta A., Karypis G., Kumar V.: Introduction to Parallel Computing, Addison Wesley, 2003. * Quinn M.J., Parallel Programming in C with MPI and Openmp, Tata McGraw-Hill 2004. |
| The effects of the education   * knowledge * skills * social competences | * knowledge: student have basic knowledge about process management and communication between them using pipes and message queues. Student can also create and manage threads in parallel applications and can apply mutex to synchronize threads. * skills: student can divide computational problem into tasks which can be solved in parallel way, implement such solution in C programming language and run it on UNIX based platforms, * social competences: student is able to work in a group to describe the problem and to choose the right method to solve the problem. |