



Subject card

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| Subject name and code | Operational Research, PG_00047719 | | | | | | |
| Field of study | Informatics | | | | | | |
| Date of commencement of studies | October 2022 | | Academic year of realisation of subject | | 2022/2023 | | |
| Education level | second-cycle studies | | Subject group | | Obligatory subject group in the field of study Subject group related to scientific research in the field of study | | |
| Mode of study | Part-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 2 | | ECTS credits | | 4.0 | | |
| Learning profile | general academic profile | | Assessment form | | exam | | |
| Conducting unit | Department of Algorithms and Systems Modelling -> Faculty of Electronics, Telecommunications and Informatics | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | prof. dr hab. inż. Marek Kubale | | | | |
| | Teachers | | prof. dr hab. inż. Marek Kubale dr Paweł Obszarski prof. dr hab. inż. Michał Pióro | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 12.0 | 0.0 | 0.0 | 15.0 | 0.0 | 27 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 27 | | 15.0 | | 58.0 | 100 |
| Subject objectives | The aim of the course is to acquaint the student with the basic scheduling algorithms and linear programming. | | | | | | |

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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
| | [K7_W01] Knows and understands, to an increased extent, mathematics to the extent necessary to formulate and solve complex issues related to the field of study. | Student knows basic algorithms for task scheduling in models with parallel machines and dedicated machines. | [SW1] Assessment of factual knowledge |
| | [K7_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study by:n- appropriate selection of source information and its critical analysis, synthesis, creative interpretation and presentation,n- application of appropriate methods and toolsn | Student knows the Simplex method for linear programming. | [SU2] Assessment of ability to analyse information |
| | [K7_U05] can plan and conduct experiments related to the field of study, including computer simulations and measurements; interpret obtained results and draw conclusions | Student knows how to formulate linear programs. | [SU1] Assessment of task fulfilment |
| | [K7_U08] while identifying and formulating engineering tasks specifications and solving these tasks, can:n- apply analytical, simulation and experimental methods,n- notice their systemic and non-technical aspects,n- make a preliminary economic assessment of suggested solutions and engineering workn | Student knows basic model of task scheduling. He/she knows how to describe them using 3-field notation. | [SU2] Assessment of ability to analyse information |
| | [K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum. | Student is able to make use of software dedicated to linear programming. | [SW3] Assessment of knowledge contained in written work and projects |
| Subject contents | Models of task scheduling. Tree-field notation. Selected algorithms for scheduling on identical processors. Selected algorithms for scheduling on dedicated processors . The definition of Linear Programming problems (LP). Applications of LP. Graphical interpretation. Simplex Method. | | |
| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Exam after semester. | 50.0% | 100.0% |
| Recommended reading | Basic literature | Janiak A., Wybrane problemy i algorytmy szeregowania zadań, Akademicka Oficyna Wydawnicza PLJ, Warszawa 1999; Hiller F. Liberman G, Introduction to Operations Research, McGraw-Hill, 2010 | |
| | Supplementary literature | Brucker P., Scheduling Algorithms, Springer Science & Business Media, 2007; Błażewicz J., Cellary W., Słowiński R., Węglarz J., Badania operacyjne dla informatyków, WNT, Warszawa, 1983; Judin D.E, Golsztein E.G., Metody programowania liniowego, WNT 1964. | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
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| Example issues/ example questions/ tasks being completed | Not concern |
| Work placement | Not applicable |