



Subject card

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| Subject name and code | Fundamentals of Computer Science, PG_00060448 | | | | | | |
| Field of study | Mechanical and Naval Engineering | | | | | | |
| Date of commencement of studies | October 2023 | | Academic year of realisation of subject | | 2023/2024 | | |
| Education level | first-cycle studies | | Subject group | | Obligatory subject group in the field of study | | |
| Mode of study | Part-time studies | | Mode of delivery | | blended-learning | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 1 | | ECTS credits | | 4.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Institute of Energy -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Tomasz Muszyński | | | | |
| | Teachers | | dr hab. inż. Tomasz Muszyński dr inż. Marta Drosińska-Komor | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 18.0 | 0.0 | 0.0 | 18.0 | 0.0 | 36 |
| | E-learning hours included: 18.0 | | | | | | |
| 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 | 36 | | 6.0 | | 58.0 | 100 |
| Subject objectives | Fundamentals of Computer Science is designed for students with little or no experience in programming. The course aims to provide students with an understanding of the role that numerical computation can play in problem solving. The course aims to help students, regardless of their specialization, analyze existing software and acquire the ability to write small useful programs. Python and VBA programming languages will be used in the class. | | | | | | |

| Learning outcomes | Course outcome | Subject outcome | Method of verification |
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| | [K6_U03] is able to identify, formulate and develop the documentation of a simple design or technological task, including the description of the results of this task in Polish or in a foreign language and to present the results using computer software or other aiding tools | The student is able to implement simple algorithms in a programming language. He can solve basic problems in the field of mathematical analysis, financial mathematics, algebra, basic statistics, present the results of calculations in a graphical form using a package for mathematical and statistical calculations. | [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment |
| | [K6_K01] is aware of the need for complementing the knowledge throughout the whole life, is able to select proper methods of teaching and learning, critically assesses the possessed knowledge; is aware of the importance of professional conduct and following the rules of professional ethics; is able to show resourcefulness and innovation in the realisation of professional projects | The student is experienced in working in a team while solving common tasks. Cooperates with other team members at various stages of solving the entrusted problem. The student has a basic knowledge of application software for scientific and engineering calculations, as well as modern network and Internet applications. Is able to use technical documentation, manuals and Internet sources to broaden his knowledge of programming languages and computing packages. | [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK2] Assessment of progress of work |
| | [K6_W07] knows the principles of engineering drawing, standards and tools used in preparation of technical documentation | The student has knowledge of the syntax, grammar and instructions of the selected programming language, its basic library and built-in functions. He knows the basic computational and data processing algorithms. Is able to use technical documentation, manuals and Internet sources to broaden his knowledge of programming languages and computing packages. | [SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge |
| Subject contents | <ol style="list-style-type: none"> 1. Introduction to programming. Debugging, semantics and syntax of a programming language. Algebraic and logical expressions. Input/output instructions. Python basics, Anaconda development environment. VBA basics for MS Excell 2. Data representation in computer memory. Basic data types: numerical, character, enumeration, other. 3. Simple control statements: conditional and selection. Iterative control statements - loops. 4. Writing programs using own procedures and functions. Using built-in language functions and libraries (numpy, matplotlib, seaborn). File handling (loading, reading) - data transfer format. 5. Calculations in the field of mathematical analysis, algebra and statistics. 6. Data analysis and visualization. Operations on various types of data. 7. Applications of information technology in industrial systems, industry 4.0. | | |
| Prerequisites and co-requisites | Basics of computer science, Internet, ability to use MS Office. | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Project work | 50.0% | 100.0% |
| Recommended reading | Basic literature | <ol style="list-style-type: none"> 1. Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003 2. William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017 | |
| | Supplementary literature | 1. https://automatetheboringstuff.com/ | |
| | eResources addresses | Adresy na platformie eNauczanie: Podstawy informatyki, W, sem 1, zima 23/24, PG_00060448 - Moodle ID: 33290 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33290 | |

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| Example issues/ example questions/ tasks being completed | <ol style="list-style-type: none"> 1. Write a program that randomly selects one integer from a user-selected number compartment. 2. Write a function that converts and then prints a number from decimal to binary. 3. Based on the supplied block diagram, write a program. 4. Analyze and visualize the provided dataset. |
| Work placement | Not applicable |

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