# GDAŃSK UNIVERSITY OF TECHNOLOGY

## Subject card

| Subject name and code | Fundamentals of IT, PG_00055866 | | | | | | |
|---|---|---|---|---|---|---|---|
| Field of study | Power Engineering | | | | | | |
| Date of commencement of studies | October 2024 | | Academic year of realisation of subject | | 2024/2025 | | |
| Education level | first-cycle studies | | Subject group | | Obligatory subject group in the field of study | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 1 | | ECTS credits | | 2.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Tomasz Muszyński | | | | |
| | Teachers | | | | | | |

| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|---|
| | Number of study hours | 0.0 | 0.0 | 0.0 | 30.0 | 0.0 | 30 |
| | 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 | 30 | 2.0 | 18.0 | 50 |

| 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 |
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| Learning outcomes | Course outcome | Subject outcome | Method of verification |
|---|---|---|---|
| | [K6_U04] is able to design a simple device structure and prepare the accompanying technical documentation, conduct a basic technical and economic analysis of energy systems, including technologies using renewable and pro-ecological energy sources as well as conventional and nuclear energy, design energy installations for them and their basic elements (including electric lighting) ); select, operate and control the most commonly used electrical devices and drive systems. | The student is able to use the basic IT tools to solve problems related to energy technology. The student is able to implement simple algorithms in a programming language. The student has knowledge of the syntax, grammar and instructions of the selected programming language, its basic library and built-in functions. Is able to use technical documentation, manuals and Internet sources. | [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information |
| | [K6_K01] is aware of the need for training and self-improvement in the profession of energy and the possibility of further education; can think and act in a creative and entrepreneurial manner; can define priorities for the implementation of an individual or group task | 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. | [SK2] Assessment of progress of work [SK1] Assessment of group work skills [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice |

| Subject contents | 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<br>2. Data representation in computer memory. Basic data types: numerical,character, enumeration, other.<br>3. Simple control statements: conditional and selection. Iterative control statements - loops.<br>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.<br>5. Calculations in the field of mathematical analysis, algebra and statistics.<br>6. Data analysis and visualization. Operations on various types of data.<br>7. Applications of information technology in industrial systems, industry 4.0. |
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| 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 | 50.0% | 100.0% |

| Recommended reading | Basic literature | Michael Kofler/ Definitive Guide to Excel VBA / Apres / 2003<br><br>William Punch, Richard Enbody/ The practice of computing using Python / Pearson/Boston/2017 |
|---|---|---|
| | Supplementary literature | https://automatetheboringstuff.com/ |
| | eResources addresses | Adresy na platformie eNauczanie: |

| Example issues/ example questions/ tasks being completed | Write a program that randomly selects one integer from a user-selected numbercompartment.<br><br>Write a function that converts and then prints a number from decimal to binary.<br><br>Based on the supplied block diagram, write a program.<br><br>Analyze and visualize the provided dataset. |
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| Work placement | Not applicable |