GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Information Technology, PG_00055196		
Field of study	Mechanical Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
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	English
Semester of study	1	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Manufacturing and Production Engineering -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Maciej Majewski	
	Teachers	dr hab. inż. Maciej Majewski dr inż. Piotr Sender	

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	6.0	39.0	75

Subject objectives

Acquiring basic knowledge in the field of information technology - IT, regarding software, as well as data processing and analysis. Acquaintance with the latest industrial trends in the field of IT.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U01	The student analyses the acquired or provided data using appropriate software. Performs basic programming tasks.	[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 identifies elements of modern information technologies, analyses the components of the IT market: hardware, software, services. It draws attention to continuous development in the field of IT, requiring continuous improvement and training, and broadening the knowledge.	[SK4] Assessment of communication skills, including language correctness [SK2] Assessment of progress of work

Subject contents

Introduction to Information Technology. Professional text preparation and editing in the word processing software. Design of databases and analysis of information stored in the different types of databases - MS Access. Creation and analysis of Pivot Tables in MS Excel. The use of MS Excel for engineering calculations as well as for creating and analyzing professional charts. Multi-criteria analysis using the method of Analytic Hierarchy Process (AHP) . Basics of Python programming language and data processing. The implementation of it to simple mathematical operations on data: sorting, search, statistics. Focusing on experimental data analysis, which could be a useful tool for engineering projects and bachelor thesis. Basics of Matplotlib library. Creation of graphs to visualize previously analysed data. Internet of Things. Industry 4.0. Individual exercises.

Prerequisites and co-requisites

Basics of computer science and programming, the ability to use the MS Office, the use of internet tools: web browsers, data clouds.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Final test	60.0%	50.0%
Assessment of individual tasks	60.0%	50.0%

<table>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Punch, W. F., & Enbody, R. (2017). The practice of computing using python. Addison-Wesley Publishing Company.
2. Bhargava, A. (2016). Grokking Algorithms: An illustrated guide for programmers and other curious people. Manning Publications Co..
3. Tosi, S. (2009). Matplotlib for Python developers. Packt Publishing Ltd.
4. Yim, A., Chung, C., & Yu, A. (2018). Matplotlib for Python Developers: Effective techniques for data visualization with Python. Packt Publishing Ltd.
5. Karkalos, N. E., Markopoulos, A. P., & Davim, J. P. (2019). Computational Methods for Application in Industry 4.0. Springer International Publishing.
6. Rawat, D. B., Brecher, C., Song, H., & Jeschke, S. (2017). Industrial Internet of Things: Cybermanufacturing Systems. Springer.
7. Gunal, Murat M. (Ed.) (2019). Simulation for Industry 4.0 Past, Present, and Future Series: Springer Series in Advanced Manufacturing.
8. Henderson, B. (2014). Rethinking the Internet of Things: a scalable approach to connecting everything. Apress.
9. Mayes, T. R. (2014). Financial analysis with microsoft excel. Boston : Cengage Learning.
10. Remenyi, D., Onofrei, G., & English, J. (2011). An introduction to statistics using Microsoft Excel. Kidmore End : Academic Publishing.
11. Saaty, T. L. (1990). Decision making for leaders: the analytic hierarchy process for decisions in a complex world. RWS publications.
12. Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International journal of services sciences, 1(1), 83-98. DOI: 10.1504/IJSSCI.2008.017590</td></tr>
<tr><td>Supplementary literature</td><td>1. Fong, B., Fong, A. C. M., & Li, C. K. (2011). Telemedicine technologies: Information technologies in medicine and telehealth. John Wiley & Sons.
2. https://www.python.org/doc/
3. https://matplotlib.org/3.1.1/contents.html</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:
Information Technology, winter 22/23 (PG_00055196) - Moodle ID: 25668
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=25668</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Prepare the text with mathematical equations according to given instructions.
2. Select the manufacturing technique using AHP method.
3. Create the appropriate database for given data.
4. Perform the required mathematical operations on the given data using Python.
5. Create the appropriate graphs and diagrams to visualize analysed data.</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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