



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Data acquisition and analysis [N2ZiIP2>AAD1]

### Course

Field of study

Management and Production Engineering

Year/Semester

1/1

Area of study (specialization)

–

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

0

Laboratory classes

16

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

### Lecturers

### Prerequisites

Basic knowledge of mathematics. Basics of using Windows and Office. Ability to think logically and independently obtain information from various sources, as well as understanding the need to learn

### Course objective

Aim of the course is to provide knowledge and practical skills in the field of broadly understood data analysis using MS Excel and miniTAB packages.

### Course-related learning outcomes

Knowledge:

Student has theoretically based, detailed knowledge about assessing the efficiency of production processes and the effectiveness of an enterprise's functioning

Student has theoretically grounded knowledge of assessing the quality of products and production processes

Students know the basics and assumptions of decision support systems, including risk assessment

Student has detailed knowledge of measurement systems used in production systems

Skills:

Student is able to notice and identify problems occurring in systems and production processes and

select and use methods and tools appropriate to solve them  
Student is able to develop an experiment plan and determine the strength and significance of the impact of production process factors on its effectiveness and efficiency  
Student is able to use experimental, data analysis and simulation methods to support decisions in various areas of enterprise operation

Social competences:

Student is aware of the need to critically analyze and evaluate their ideas and actions  
Student understands the need to make changes in production processes and in the company.  
Student understands the need for continuous learning; can inspire and organize the learning process of team members  
Student is able to think and act in a creative and entrepreneurial way

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Laboratory: assessment based on reports from laboratory exercises. To pass, all exercises must be approved

### Programme content

Advanced Data Analysis Tools in MS Excel.  
Data Analysis Tools in Minitab.

### Course topics

Laboratories:

1. Module 8 hours - MS Excel: Array formulas and functions. Useful keyboard shortcuts. Interpretation of error messages in MS Excel. Search and address, date and time and text functions. Charts. Downloading data to a spreadsheet from various sources. Statistical calculations in the worksheet. Simulation and interactive worksheet elements. Data analysis in a spreadsheet. Filtering, subtotal, pivot table, forms. Macros - basics.
2. Module 8 hours - miniTAB: Basics of miniTAB - data sheet, analysis sheet, basic analysis tools. Functions related to the determination of descriptive statistics. Charts, chart creator and assistant. Module - quality management. Module - Design of Experiments.

### Teaching methods

Laboratory: practical classes at the computer in IT applications: MS Excel, miniTAB.

### Bibliography

Basic:

1. Aczel A.D., Complete business statistics, PWN, Wohl Publishing, 2012
4. Larose T., Discovering Knowledge in Data: An Introduction to Data Mining, 2005, Wiley & Sons
5. Berry M.J.A., Linoff G., Mastering data mining, 2000, Wiley & Sons
6. Han J., Kamber M., Pei J., Data Mining: Concepts and Techniques, 3rd Edition, in Morgan Kaufmann Series in Data Management Systems, 2012, Elsevier
7. WALKENBACH J., Excel 2019. Biblia, Helion, Gliwice 2019.
8. WINSTON W., Microsoft Excel 2016. Analiza i modelowanie danych, Promise, Warszawa 2017.
9. BOURG J., Excel w nauce i technice. Receptury, O'Reilly/Helion, Gliwice 2006.

Additional:

7. Hamrol A., Zarządzanie jakością z przykładami, PWN Warszawa, 2008
8. Francuz P., Mackiewicz R., Liczby nie wiedzą skąd pochodzą, Wydawnictwo KUL, Lublin, 2007

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	16	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	34	1,50