# STUDY MODULE DESCRIPTION FORM

| Name of the module/subject | | Code |
|---|---|---|
| **Introduction to Signal Processing** | | **1011101361011000409** |
| Field of study | Profile of study (general academic, practical) | Year /Semester |
| **Engineering Management - Full-time studies -** | **(brak)** | **3 / 6** |
| Elective path/specialty | Subject offered in: | Course (compulsory, elective) |
| **-** | **Polish** | **elective** |
| Cycle of study: | Form of study (full-time,part-time) | |
| **First-cycle studies** | **full-time** | |

| No. of hours | | | | | No. of credits |
|---|---|---|---|---|---|
| Lecture: **15** | Classes: **-** | Laboratory: **15** | Project/seminars: **-** | | **2** |

| Status of the course in the study program (Basic, major, other) | (university-wide, from another field) |
|---|---|
| **(brak)** | **(brak)** |

| Education areas and fields of science and art | ECTS distribution (number and %) |
|---|---|
| | |

## Responsible for subject / lecturer:

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## Prerequisites in terms of knowledge, skills and social competencies:

| | | |
|---|---|---|
| 1 | **Knowledge** | Basic concepts of algebra, probability theory, computer science, information technology |
| 2 | **Skills** | Basic ability to lead calculations and computer simulations |
| 3 | **Social competencies** | Awareness of the importance of digital signal processing algorithms in modern data communications systems |

## Assumptions and objectives of the course:

-Introduction to basic data recording techniques, conversion and analysis of digital signals.

## Study outcomes and reference to the educational results for a field of study

### Knowledge:

1. Knowledge of the analog-to-digital conversion - [K04-InzA_W02]
2. Interpretation of the frequency characteristics of signals - [K04-InzA_W02]
3. Knowledge of the ideas of lossless and lossy compression - [K04-InzA_W05]
4. Knowledge of data encryption and correction - [K04-InzA_W05]

### Skills:

1. Student is able to make a critical analysis of the processes of machinery production and the organization of production systems - [K01-InzA_U5]
2. Student is able to identify the project tasks and solve simple design tasks in the construction and operation of machines - [K01-InzA_U6]
3. Student is able to use the typical method of solving simple problems involving the construction and operation of machines - [K01-InzA_U7]

### Social competencies:

1. Student is able to consciously explain the desirability of the use of digital technology - [K01-InzA_K1]
2. Student is aware of the need to select appropriate coding techniques - [K01-InzA_K2]

## Assessment methods of study outcomes

-Forming score:
Current rating of realized tasks (scale from 2 to 5).
Answers to questions about the material covered in previous lectures.
Summary score:
Written test.
Reports from laboratory classes.

## Course description

-Parameters of deterministic and random signals, digitization of analog signals, frequency analysis of signals, DFT algorithms, linear systems, information theory, entropy coding, dictionary coding, discrete cosine transform (DCT), lossy compression, data encryption and data correction.

## Basic bibliography:

## Additional bibliography:

## Result of average student's workload

| Activity | Time (working hours) |
|---|---|
| 1. Lectures | 15 |
| 2. Laboratories | 15 |
| 3. Preparation for laboratories | 10 |
| 4. Consultations | 10 |
| 5. Assessment and final test | 10 |

## Student's workload

| Source of workload | hours | ECTS |
|---|---|---|
| Total workload | 60 | 2 |
| Contact hours | 50 | 2 |
| Practical activities | 35 | 1 |