**Nazwa przedmiotu:**

Software Engineering

**Koordynator przedmiotu:**

Prof. Jędrzej Mączak, PhD, DSc

**Status przedmiotu:**

Obowiązkowy

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Electric and Hybrid Vehicles Engineering

**Grupa przedmiotów:**

Obowiązkowe

**Kod przedmiotu:**

1150-PE000-ISA-0352

**Semestr nominalny:**

4 / rok ak. 2022/2023

**Liczba punktów ECTS:**

2

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

1) Number of contact hours - 32, including;
a) laboratory - 30 h;
b) consultations – 2 h.
2) Student’s individual work - 20 h, including:
a) ongoing preparation for laboratory exercises - 20 h;
3) TOTAL – 52.

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

1.2 ECTS points – number of contact hours -32, including:
a) laboratory - 30 h;
b) consultations – 2 h.

**Język prowadzenia zajęć:**

angielski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

2 ECTS points – number of contact hours -52, including:
a) laboratory – 30 h;
b) consultations – 2 h
b) ongoing preparation for exercises - 20 h;

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład: | 0h |
| Ćwiczenia: | 0h |
| Laboratorium: | 30h |
| Projekt: | 0h |
| Lekcje komputerowe: | 0h |

**Wymagania wstępne:**

Basic knowledge of microprocessor and computer programming languages (C and Matlab). Basic knowledge of microprocessor systems (course Introduction to Microprocessor Systems). Basic knowledge of the description of algorithms and construction of block diagrams.

**Limit liczby studentów:**

30 students per group

**Cel przedmiotu:**

Ability to build control and measurements applications in the Windows environment as well as on the real-time systems. Obtaining basic knowledge of networking (CAN and Ethernet). Obtaining basic knowledge of programming controllers including software architectures, networking and data acquisition.

**Treści kształcenia:**

Part I: Introduction to the LabVIEW graphic language programming
• Introduction to the LabVIEW environment
- programming environment
- projects
• Basic data structures, operations and graphical presentation of the results
• Code implementation (loops, case structures)
• Introduction to the modular programming
• Programming techniques
Part II: Introduction to the control and measurement applications:
• basic software architectures,
• introduction to the data acquisition systems,
• synchronization of the processes,
• Internet protocols,
• CAN networks.

**Metody oceny:**

Preparation test for laboratory classes (test at the beginning of classes). Evaluation of the quality of software written during classes.
The point score is used:
• test - 2 points,
• exercise - 3 points
To complete the exercise, you need 3 points.
The final grade is the average of grades for all exercises (converted from point grades). All exercises are required.

**Egzamin:**

nie

**Literatura:**

• LabVIEW Core 1 Course Manual. National Instruments.
• LabVIEW Core 1 Exercises Manual. National Instruments.
• LabVIEW Core 2 Course Manual. National Instruments.
• LabVIEW Core 2 Exercises Manual. National Instruments
All the materials necessary for the preparation for the exercises at home are available on the web page of the course including: textbooks, introductory exercises and exercise curriculum.
Students are required to install educational copies of Matlab and LabVIEW (serial numbers are provided during the first meeting)

**Witryna www przedmiotu:**

http://www.mechatronika.net.pl. Intranet of the laboratory: available after loging. Login and password will be given during the first meeting)

**Uwagi:**

Obligatory presence on all exercises.

## Efekty przedmiotowe

### Profil ogólnoakademicki - wiedza

**Efekt 1150-00000-ISA-0352\_W1:**

Wpisz opis

Weryfikacja:

Tests checking preparation for the classes and the the degree of acquiring knowledge from previous exercises.

**Powiązane efekty kierunkowe:** K\_W07, K\_W14, K\_W18

**Powiązane efekty obszarowe:** T1A\_W02, T1A\_W04, T1A\_W02, T1A\_W03, T1A\_W04, T1A\_W07

### Profil ogólnoakademicki - umiejętności

**Efekt 1150-00000-ISA-0352\_U1:**

Can acquire information from literature, databases and other sources; can integrate the obtained information, make their interpretation, as well as draw conclusions and formulate and justify opinions.
Can independently improve the knowledge gained during programming classes.
Is able to build basic programs in Matlab and LabVIEW languages used to register and analyze signals in accordance with the given specification.

Weryfikacja:

Tests checking the preparation for classes and the degree of acquiring knowledge from previous exercises. Evaluation of the quality of written software.

**Powiązane efekty kierunkowe:** K\_U01, K\_U06, K\_U08, K\_U17, K\_U18

**Powiązane efekty obszarowe:** T1A\_U01, T1A\_U05, T1A\_U08, T1A\_U09, T1A\_U01, T1A\_U16, T1A\_U16

### Profil ogólnoakademicki - kompetencje społeczne

**Efekt 1150-00000-ISA-0352\_K1:**

Is able to interact and work in a group in the implementation of laboratory exercises and preparing reports, taking various roles in it

Weryfikacja:

Assessment of task performance during the implementation of exercises

**Powiązane efekty kierunkowe:** K\_K04, K\_K05

**Powiązane efekty obszarowe:** T1A\_K03, T1A\_K04, T1A\_K06