

# Embedded systems design - opis przedmiotu

| Informacje ogólne   |                                                                   |
|---------------------|-------------------------------------------------------------------|
| Nazwa przedmiotu    | Embedded systems design                                           |
| Kod przedmiotu      | 06.0-WE-INF-D-ESD-Er                                              |
| Wydział             | <a href="#">Wydział Informatyki, Elektrotechniki i Automatyki</a> |
| Kierunek            | Informatyka                                                       |
| Profil              | ogólnoakademicki                                                  |
| Rodzaj studiów      | Program Erasmus drugiego stopnia                                  |
| Semestr rozpoczęcia | semestr zimowy 2021/2022                                          |

| Informacje o przedmiocie        |                                                                           |
|---------------------------------|---------------------------------------------------------------------------|
| Semestr                         | 2                                                                         |
| Liczba punktów ECTS do zdobycia | 5                                                                         |
| Typ przedmiotu                  | obieralny                                                                 |
| Język nauczania                 | angielski                                                                 |
| Sylabus opracował               | <ul style="list-style-type: none"><li>dr inż. Michał Doligalski</li></ul> |

| Formy zajęć  |                                         |                                        |                                            |                                           |                     |
|--------------|-----------------------------------------|----------------------------------------|--------------------------------------------|-------------------------------------------|---------------------|
| Forma zajęć  | Liczba godzin w semestrze (stacjonarne) | Liczba godzin w tygodniu (stacjonarne) | Liczba godzin w semestrze (niestacjonarne) | Liczba godzin w tygodniu (niestacjonarne) | Forma zaliczenia    |
| Wykład       | 30                                      | 2                                      | -                                          | -                                         | Egzamin             |
| Laboratorium | 30                                      | 2                                      | -                                          | -                                         | Zaliczenie na ocenę |

## Cel przedmiotu

- familiarize students with the basic techniques of integrated design (co-design) of the hardware and software system
- forming among students the understanding of the necessity of integrating solutions
- hardware and software in an embedded system
- development of basic skills in the design of systems and systems
- prisoners, and their software.

## Wymagania wstępne

## Zakres tematyczny

Trends on the electronics market, especially integrated systems. The role of systems embedded in modern electronics. An integrated approach to designing as new quality in relation to traditional methods. Basic design stages integrated: specification, translation into a formal model, modeling, verification, co-simulation, decomposition, implementation of hardware and software parts. Specification microprocessor systems at the system level. Application of description languages hardware (VHDL, Verilog, etc.) and programming (C / C ++, Java, etc.) for system representation

hardware and software. Formal models used in integrated design: requirements and features of models. Discussion of the most important types of models. architecture integrated systems (typical elements of architecture, a typical architecture template, coprocessor operating mode, cost of HW / SW interface). Specialized hardware processors (FPGA / CPLD) and software (ASIP).

## Metody kształcenia

lecture: conventional lecture

laboratory: group work, practical classes, laboratory exercises

## Efekty uczenia się i metody weryfikacji osiągnięcia efektów uczenia się

| Opis efektu                                                                                                 | Symbole efektów | Metody weryfikacji                                                                               | Forma zajęć                                                  |
|-------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| He can, using CAD tools, to design a simple embedded system and program it with using programming languages |                 | <ul style="list-style-type: none"><li>bieżąca kontrola na zajęciach</li><li>sprawdzian</li></ul> | <ul style="list-style-type: none"><li>Laboratorium</li></ul> |
| He can indicate the design stages integrated, discuss architecture embedded system.                         |                 | <ul style="list-style-type: none"><li>egzamin - ustny, opisowy, testowy i inne</li></ul>         | <ul style="list-style-type: none"><li>Wykład</li></ul>       |
| He knows formal models and their features used in design integrated                                         |                 | <ul style="list-style-type: none"><li>egzamin - ustny, opisowy, testowy i inne</li></ul>         | <ul style="list-style-type: none"><li>Wykład</li></ul>       |
| He understands the role of embedded systems in modern electronics is able to apply them practically         |                 | <ul style="list-style-type: none"><li>bieżąca kontrola na zajęciach</li><li>sprawdzian</li></ul> | <ul style="list-style-type: none"><li>Laboratorium</li></ul> |

## Warunki zaliczenia

- Lecture - A pass condition is to get a positive exam grade implemented in writing. The condition to take the exam is a positive assessment from the laboratory.
- Laboratory - the condition for passing is to get positive grades from everyone laboratory exercises planned for implementation as part of the laboratory program (80%) and active participation in classes (20%).
- Components of the final grade = lecture: 50% + laboratory: 50%

## Literatura podstawowa

1. Embedded System Design, fourth edition, Springer Nature Switzerland AG, 2021, ISBN: 303060909X
2. Balarin F. et al.: Hardware-Software Co-Design of Embedded Systems. The POLIS Approach, Kluwer Academic Publishers, 1997.
3. Ashenden P., Digital Design (VHDL) An Embedded Systems Approach Using VHDL, Morgan Kaufmann, 2007
4. Proceedings of the IEEE, Special issue on Hardware/Software Codesign, vol. 85, No. 3, March 1997.
5. Staunstrup J., Wolf W. (eds.): Hardware/Software Co-Design: Principles and Practice, Kluwer Academic Publishers, 1997.
6. Ciletti M. D.: Modeling, Synthesis, and Rapid Prototyping with the Verilog HDL, Prentice-Hall, Upper Saddle River, NJ, 1999.

## Literatura uzupełniająca

1. Vahid F., Givargis T.: Embedded System Design: A Unified Hardware/Software Introduction, Wiley, 2002, ISBN: 978-0-471-38678-0
2. Douglass B., Real Time UML Workshop for Embedded Systems, Newnes, 2006
3. Sass R., Schmidt A, Embedded Systems Design with Platform FPGAs, Morgan Kaufmann, 2010

## Uwagi

Zmodyfikowane przez dr inż. Michał Doligalski (ostatnia modyfikacja: 08-09-2021 21:13)

Wygenerowano automatycznie z systemu SylabUZ