

Computer-aided design - course description

General information	
Course name	Computer-aided design
Course ID	11.9-WE-INFP-C-AD-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Computer Science
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information	
Semester	5
ECTS credits to win	4
Course type	obligatory
Teaching language	english
Author of syllabus	dr hab. inż. Janusz Kaczmarek, prof. UZ

Classes forms					
The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	15	1	-	-	Credit with grade
Laboratory	30	2	-	-	Credit with grade

Aim of the course

Know-how and competences in the field of designing and creating the software for measurement systems with the use of specialized integrated software environments: LabVIEW and LabWindows.

Prerequisites

Principles of programming, Experimental techniques

Scope

Basic knowledge of the virtual instruments. Basic definitions. Characteristic of integrated software environments to designing the software for virtual instruments and measurement systems.

Introduction to programming in LabWindows. LabWindows overview. Basics of creating the Graphical User Interface. Generating the source code. Methods of designing programs: callback functions and event loops. Debugging techniques. Properties and programming control of GUI objects. Characteristic of library functions for analysis and processing of measurement signals. Methods of creating reports from measurements. Creating and distributing executable program.

Application of network techniques in distributed measurement software.

Introduction to programming in LabVIEW. Concept of the graphical programming language G. Building a front panel and block diagram. Basic and composite data types. Controlling program execution with loops and structures: for, while, shift-register mechanism, case, sequence, formula node. Operations on arrays and strings. Characteristic of library functions for analysis and processing of measurement signals.

Selected programming techniques in LabVIEW. Hierarchical programming. Global and local variables. Polling and event-driven programming models. Express technology.

Teaching methods

Lecture: conventional lecture

Laboratory: laboratory exercises, group work

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Can implement programming tasks in teamwork.		- an ongoing monitoring during classes - carrying out laboratory reports	Laboratory
Can program in LabWindows/CVI and LabVIEW environments.		- an evaluation test - an ongoing monitoring during classes - carrying out laboratory reports	- Lecture - Laboratory

Outcome description	Outcomesymbols	Methods of verification	The class form
Can design virtual measuring instruments and knows the practical advantages of the devices of this type.		• a multiple choice and open questions test • an evaluation test • an ongoing monitoring during classes	• Lecture • Laboratory
Knows the basic techniques of designing and creating computer software for measurement systems using specialized graphical programming environments.		• an evaluation test • an ongoing monitoring during classes • carrying out laboratory reports	• Lecture • Laboratory

Assignment conditions

Lecture – the passing condition is to obtain a positive mark from the final test.

Laboratory – the passing condition is to obtain positive marks from all laboratory exercises to be planned during the semester.

Calculation of the final grade: lecture 40% + laboratory 60%

Recommended reading

1. Khalid S.F.: LabWindows/CVI Programming for Beginners. Prentice Hall PTR, 2000.
2. Khalid S.F.: Advanced Topics in Labwindows CVI. Prentice Hall PTR, 2001.
3. Essick J.: Hands-On Introduction to LabVIEW for Scientists and Engineers, Oxford University Press, 2012.
4. Winiecki W.: Organization of computer measurement systems, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 1997 (in Polish)

Further reading

Notes

Modified by dr hab. inż. Janusz Kaczmarek, prof. UZ (last modification: 14-07-2021 09:41)

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