Testing information systems - course description

General information

Course name	Testing information systems
Course ID	06.0-WE-INFP-TestInformSys-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 2019/2020

Course information

Semester	6
ECTS credits to win	5
Course type	optional
Teaching language	english
Author of syllabus	• dr inż. Michał Doligalski

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
Project	15	1	-	-	Credit with grade

Aim of the course

- Familiarize students with the life cycle of a computer system with particular emphasis on the tools and techniques of verification
- Shaping the understanding of the need to ensure the highest quality and reliability of information systems
- shaping skills to design and verification of computer systems, and in particular the use of automate test tools to and verification of hardware part of systems

Prerequisites

digital Circuits

Scope

Basic principles of testing programs, testing place in the computer engineering and software engineering. Inspection of the source code and test cases development. Testing individual application modules, integration testing. Functional testing, system, acceptance, and installation. Extreme testing. Web applications testing. Continuous integration. Test automation. Construction and operation of diagnostic tools: Introduction to the construction, principles of operation and measurement digital diagnostic apparatus. The use of an oscilloscope and arbitrary waveform generator for generating digital waveforms and analog waveforms recorded on the basis of using an oscilloscope. The boundary conditions of work of digital circuits. Diagnosis of hardware-software systems micro-informatics: Logic analyzer in the analysis of digital systems. Developing algorithms trigger based on changes or signal values. Use of simulation results verifies the prototype stage. Extending digital microsystems of the block generator for testing. Analysis of transmission in computer networks. Diagnostic software: Embedding test modules inside embedded systems (Chipscope Pro).

Teaching methods

- Lecture: Lecture problem, lecture conventional
- laboratory: group work, laboratory exercises
- project: teamwork, project method

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Has basic knowledge on informatics systems life cycles, and on methods and tools for informatics systems verification and testing		• a pass - oral, descriptive, test and other	• Lecture
Knows and can apply tools supporting processes of software testing and tests automation		• a pass - oral, descriptive, test and other • an ongoing monitoring during classes	• Lecture • Laboratory
Is able to creatively plan tests and interpret its results. In the light of the results identify the malfunction area (both, in hardware and software) and suggest a method for its elimination		• a quiz • an ongoing monitoring during classes	• Laboratory • Project

Outcome description	Outcome symbols	Methods of verification	The class form
Is aware of impact of particular stages of design process on error occurrence in an IT project and their elimination cost		• a pass - oral, descriptive, test and other	• Lecture
Can use digital diagnostic equipment and dedicated software and appropriately select tools for carrying out tests (both software and hardware systems)		• a preparation of a project • a quiz • an ongoing monitoring during classes	• Laboratory • Project

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.
- Project - - project, report, oral presentation the passing condition is to obtain positive marks
- Calculation of the final grade: lecture 40% + laboratory 30% + project 30%

Recommended reading

1. How Google Tests Software, James A. Whittaker, Jason Arbon, Jeff Carollo, Addison-Wesley Professional, 2012
2. The Digital Quality Handbook: Guide for Achieving Continuous Quality in a DevOps Reality, Eran Kinsbruner, 2017
3. Test Automation in the Real World: Practical Lessons for Automated Testing
   by Greg Paskal
4. Testing of Digital Systems, N. K. Jha (Author), S. Gupta (Author), Cambridge University Press, 2003

Further reading

1. Digital Systems Testing and Testable Design, Miron Abramovici, Melvin A. Breuer, Arthur D. Friedman, Wiley-IEEE Press, 1994

Notes

Modified by prof. dr hab. inż. Andrzej Obuchowicz (last modification: 27-10-2019 10:50)