



The Faculty of:	Faculty of Electrical and Computer Engineering
Field of study:	Computer Engineering
Speciality:	-
Study degree (BSc, MSc):	First circle full time studies (BSc)

COURSE UNIT DESCRIPTION

Course title:	Languages, automata and computations
Lecturer responsible for course: Lesław Gniewek, PhD.	
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Department : Department of Computer and Control Engineering	

Semester	Weekly load	Type of classes				Number of ECTS credits
		L Lectures	C Theoretical Classes	Lb Laboratory	P Project	
3	4	30	-	15	15	6

Course description
<p>Lecture:</p> <ol style="list-style-type: none"> 1. Introduction, basic notions of mathematical linguistics. 2. Context-free grammars. 3-4. Simplification and transformation context-free grammar. 5. Operations on context-free languages. Lemma about pumping. 6. The membership of word to context-free language. 7. Regular expressions, regular languages. 8. Deterministic and complete grammars. 9. Context languages, hierarchy Chomsky. 10. Finite automata and their analysis. 11-12. Stack automata, computability, Turing machines. 13. Universal programming language, evolution of paradigms of programming. 14. Imperative paradigm, object-oriented paradigm. 15. Programming in logic, functional programming.
<p>Classes:</p> <p>-</p>
<p>Laboratory:</p> <ul style="list-style-type: none"> • Programming in logic • Examples of imperative programming • Functional programming

Project:

- Context-free languages
- Transformation context-free grammar
- The membership of word to context-free language
- Deterministic and complete grammars
- Finite automata and their analysis

Objectives of the course

Student should obtain basic knowledge about theoretical foundations of computer science and paradigms of programming.

Examination method

Lecture: Written solution of problems.

Laboratory: Written test and short questions before every lab.

Project: Discussion about written project.

Bibliography

1. Hopcroft J. E., Ullman J. D., „Wprowadzenie do teorii automatów, języków i obliczeń”, PWN, W-wa, 2003.
2. Kluska J., Gniewek L., „Materiały pomocnicze do przedmiotu Teoretyczne podstawy informatyki”, Oficyna Wyd. Politechniki Rzeszowskiej, 2004.
3. Van Roy P., Haridi S., „Programowanie. Koncepcje, techniki i modele”, Helion, 2005.
4. Kowalski S., Mostowski A. Wł., „Teoria automatów i lingwistyka matematyczna”, PWN, Warszawa, 1979.
5. Brookshear J.G., „Informatyka w ogólnym zarysie”, WNT, Warszawa, 2003.
6. Aho A.V., Sethi R., Ullman J.D., „Kompilatory. Reguły, metody i narzędzia”, WNT, Warszawa, 2002.
7. Birkhoff G., Bartee T. C., „Współczesna algebra stosowana”, PWN, Warszawa, 1983.

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Head of Department signature	
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