Z1-PU7	WYDANIE N1

(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: SOFT COMPUTING, Formal Languages	**2. Course code SC_FL**
3. Validity of course description: 2018/2019	
4. Level of studies: MSc programme	
5. Mode of studies: intramural studies	
6. Field of study: CONTROL, ELECTRONIC AND INFORMATION ENGINEERING (MACRO)	(FACULTY SYMBOL) RAU-2
7. Profile of studies: ACADEMIC	
8. Programme: DATA SCIENCE	
9. Semester: 1	
10. Faculty teaching the course: Faculty of Automatic Control, Electronics and Computer Science	
11. Course instructor: Dr inż. Krzysztof Simiński	
12. Course classification: common courses	
13. Course status: compulsory ~~/elective~~	
14. Language of instruction: English	
15. Pre-requisite qualifications: Algebra, Computer programming, Algorithms and data structures.	
16. Course objectives: The aim of the course is presentation of theory of formal languages, their connection to theory of computing. The course also presents practical application of formal languages in data analysis.	

17. Description of learning outcomes:

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Student knows and understands basic notions and classifications in the area of formal languages.	Credit	Lecture	K_W01
2.	Student knows and understands properties of regular languages.	Credit	Lecture	K_W03
3.	Student knows properties and applications of context free languages.	Credit	Lecture	K_W03
4.	Student knows properties and applications of context and countable languages.	Credit	Lecture	K_W03
5.	Student is able to develop analysis software module for regular language.	Laboratory tasks	Laboratory	K_U01
6.	Student is able to model context free language by using appropriate grammar.	Laboratory tasks	Laboratory	K_U03

18. Teaching modes and hours

Lecture 15 / ~~BA /MA Seminar / Class / Project~~ / Laboratory 15

19. Syllabus description:

Lecture:

1. Introductory issues: alphabet, string, language, classification of languages, application of formal languages and models.
2. Regular languages: algebra of formal languages, regular expressions.

3. Regular languages: Kleene theorem, finite automata.
4. Context free languages: properties, pumping lemma.
5. Analysis of context free languages: LL automata.
6. Analysis of context free languages: LR automata.
7. Context and recursive languages, Church-Turing thesis.

Project:

1. Analysis of regular languages.
2. Analysis of context free languages.

20. Examination: semester NO

21. Primary sources:

J. E. Hopcroft, R. Motwani, J. D. Ullman – Introduction to automata theory languages and computation, Pearson, 2006

22. Secondary sources:

A. Aho, Compilers: Principles, Techniques, and Tools, Addison Wesley, 2006
Aleksander Meduna, Formal Languages and Computation: Models and Their Applications, CRC Press, 2014

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/15
2	Classes	/
3	Laboratory	/
4	Project	15/15
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	30/30

24. Total hours: 60

25. Number of ECTS credits: 2

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 1

26. Comments:

Approved:

…….
(date, Instructor's signature)

……
(*date , the Director of the Faculty Unit signature)*