DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR DECLARING/CONDUCTING COURSE: Kamil Staniec, Dariusz Król
DEPARTMENT: Faculty of Information and Communication Technology (W4)
SCIENTIFIC DISCIPLINE: information and communication technology

COURSE CARD

Course name in Polish: Najnowsze kierunki badań w informatyce i telekomunikacji

Course name in English: **The latest research directions in discipline information and communication technology**

Course language: ~~polish~~/ English

The course is intended for all PhD students: ~~YES~~ / NO (only for Automation, Electronic and Electrical Engineering; Information and Communication Technology; Mathematics)

~~**1) BASIC COURSE**~~
2) SPECIALIST COURSE
~~**3) SEMINAR**~~
~~**4) HUMANISTIC COURSE**~~
~~**5) LANGUAGE**~~
~~**6) RESEARCH SKILLS**~~

Subject code: ITQ100248W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic, general information on data transmission
2. Basics of discrete mathematics and statistics
2.

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COURSE OBJECTIVES

C1. Presentation of the latest trends in the field of telecommunications (radio, optical, terahertz and others) and related areas, including computational electromagnetism

C2. Presentation of the latest trends in knowledge engineering, including issues related to recommendation systems, the use of knowledge graphs, predictive analysis and knowledge propagation methods
C3. Presentation of the latest trends in data engineering, including issues related to multi-criteria evaluation of data quality, relativization methods and the use of intelligent learning methods and observation identification for datafication processes
C4. Presentation of the latest computational methods related to the field of collective intelligence
C5. Presentation of affective informatics, in particular the recognition of emotions from physiological data, as well as the challenges of interdisciplinary research linking computer science and social sciences
C6. Acquainting students with the current state of knowledge of problems related to preprocessing and the use of data obtained by special kind of sensors: satellites in various fields of the environment in order to analyze this data and construct hybrid models in combination with terrestrial data
C7. Developing the ability of students to characterize issues from various fields and their modeling, and to make a spatial predictions based on satellite sensors data
C8. Presentation of the latest research directions in the field of ICT networks

PROGRAM CONTENTS

	Lecture	Number of hours
L1	Advanced telecommunications systems (K. Staniec)	2
L2	Data from satellite sensors: processing and application (Anna Kamińska-Chuchmała)	2
L3	The latest research directions in the field of ICT networks I (K. Walkowiak)	2
L4	The latest research directions in the field of ICT networks II (K. Walkowiak)	2
L5	The latest research directions in the field of ICT networks III (K. Walkowiak)	2
L6	Computational Aspects of Collective Intelligence I (N.T. Nguyen, Marcin Maleszka)	2
L7	Computational Aspects of Collective Intelligence II (N.T. Nguyen, Marcin Maleszka)	2
L8	Affective informatics: tasks (P. Kazienko)	2
L9	Affective informatics: methods and challenges (P. Kazienko)	2
L10	Advanced tools and methods of knowledge engineering I (D. Król)	2
L11	Advanced tools and methods of knowledge engineering II (D. Król)	2
L12	Advanced tools and methods of knowledge engineering III (D. Król)	2
L13	Advanced tools and methods of knowledge engineering IV (D. Król)	2
L14	Lecture by an invited guest	2
L15	Compendium of the most important developments	2
	Total hours	30

TEACHING TOOLS USED

N1. A lecture using the traditional method or a lecture with the use of multimedia or videoconferencing tools.
N2. The student's own work with the use of the indicated literature.
N3. Stationary or remote consultations.

ACHIEVED SUBJECT LEARNING OUTCOMES		
Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	Written exam in the form of a test
Knowledge	P8S_WK	Written exam in the form of a test

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] Petro Vorobiyenko, Mykhailo Ilchenko, Iryna Strelkovska: Current Trends in Communication and Information Technologies, Lect. Notes in Networks, Syst., Springer, 2021, https://doi.org/10.1007/978-3-030-76343-5
[2] Fensel, D., et al.: Knowledge Graphs: Methodology, Tools and Selected Use Cases. Springer, Switzerland (2020), https://doi.org/10.1007/978-3-030-37439-6
[3] Hakim Hacid, Quan Z. Sheng, Tetsuya Yoshida, Azadeh Sarkheyli, Rui Zhou: Data Quality and Trust in Big Data - 5th International Workshop, QUAT 2018, Held in Conjunction with WISE 2018, Dubai, UAE, November 12-15, 2018, Revised Selected Papers. Lecture Notes in Computer Science 11235, Springer 2019, ISBN 978-3-030-19142-9, https://doi.org/10.1007/978-3-030-19143-6
[4] Nguyen N.T., "Advanced Methods for Inconsistent Knowledge Management", Springer London (2009), https://doi.org/10.1007/978-1-84628-889-0
[5] Król D., Fay D., Gabrys B. (Eds.) (2015): Propagation Phenomena in Real World Networks, Intelligent Systems Reference Library, vol. 85, Springer, 364 p. https://doi.org/10.1007/978-3-319-15916-4

SECONDARY LITERATURE:

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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