### SCIENTIFIC ISSUES

# JAN DŁUGOSZ UNIVERSITY in CZĘSTOCHOWA

# MATHEMATICS XXI

Scientific Editor Joanna Grygiel



#### Scientific Board

- Jiří Cihlář Applications of Mathematics and Statistics, Education in Mathematics – J. E. Purkyné University in Usti nad Labem, Czech Republic
- Roman Frič Probability Theory, Fuzzy Mathematics, Quantum Structures – Slovak Academy of Science, Košice & Catholic University in Ružomberok, Slovak Republic
- Joanna Grygiel *Universal Algebra*, *Logic* Jan Długosz University in Częstochowa, Poland
- Ján Gunčaga Mathematics Education, Teaching Methods, Pedagogic Theory Katolícka Univerzita v Ružomberku, Slovakia
- Jacek M. Jędrzejewski Theory of Functions, Mathematical Analysis – Jan Długosz University in Czestochowa, Poland
- Bohumil Novák Education in Mathematics Palacký University in Olomouc, Czech Republic
- Adam Płocki Probability Theory, Education in Mathematics State Higher Vocational School in Nowy Sacz, Poland
- Yuriy Povstenko Application of Mathematics Jan Długosz University in Częstochowa, Poland
- Grażyna Rygał Education in Mathematics Jan Długosz University in Częstochowa, Poland
- Oleg Tikhonenko Computer Science, Applications of Mathematics – Częstochowa University of Technology, Poland
- Pavel Tlustý Probability Theory, Optimization, Education in Mathematics University of South Bohemia in České Budějovice, Czech Republic
- Marián Trenkler Education in Mathematics, Graph Theory Catholic University in Ružomberok, Slovak Republic
- Małgorzata Wróbel *Mathematical Analysis* Częstochowa University of Technology, Poland
- Tomáš Zdráhal Algebra, Education in Mathematics Palacký University in Olomouc, Czech Republic
- Marcin Ziółkowski Statistics, Computer Science Jan Długosz University in Częstochowa, Poland

Secretary: **Katarzyna Domańska**Computer Typesetting and Making-up: **Andrzej Zbrzezny**Graphical Project of a Cover: **Sławomir Sadowski**ISSN 2450-9302

 ${\hbox{@}}$ Copyright by Jan Długosz University in Częstochowa, 2016 Printed version is the primary one.

#### Cooperating Reviewers

Piotr Artiemjew — University of Warmia and Mazury in Olsztyn

Grzegorz Bryll — University of Opole (retired)

Yevhen Chaplia — Ukrainan Academy of Sciences, Lviv, Ukraine

Imed El Fray — Warsaw University of Life Sciences

Roman Frič — Slovak Academy of Science, Košice;

& Catholic University in Ružomberok, Slovak Republic

Roman Ger — Silesian University in Katowice

Katarzyna Grygiel — Jagiellonian University

Ján Gunčaga — Catholic University in Rużomberok, Slowak Republic

Jacek Jędrzejewski — Jan Długosz University in Częstochowa (retired)

**Zygfryd Kominek** — Silesian University in Katowice

Mirosław Kurkowski — Cardinal Stefan Wyszyński University

Janusz Matkowski — University of Zielona Góra

Tomasz Połacik — University of Silesia, Katowice

Tadeusz Poreda — Łódź University of Technology

Yaroslav P'yanylo — Ukrainian National Academy of Sciences

Paweł Róg — Częstochowa University of Technology

Grażyna Rygał — Jan Długosz University in Częstochowa

Robert Sochacki — University of Opole

Marcin Szpyrka — AGH University of Science and Technology

Oleg Tikhonenko — Cardinal Stefan Wyszyński University in Warsaw

Szymon Wąsowicz — The University of Bielsko-Biała

Władysław Wilczyński — University of Łódź

Wacław Zawadowski — Warsaw University

## Contents

Part 1	I – Education in Mathematics
1.	K. Domańska, M. Wróbel – About the ways of defining connected sets in the topological spaces 11
2.	A. Olek – CLIL Method in Mathematics Teaching at University Level
Part 1	II – Mathematics and Its Applications
1.	A. Górnicka, J. Grygiel, I. Tyrala – On the lattice of tolerances for a finite chain25
2.	Z. Kostrzycka – All splitting logics in the lattice NEXT(KTB.3'A)31
3.	T. Kyrylych – Economic-Mathematical Model for Risk Management of Sales Channels of Small Enterprises63
4.	K. Nowakowska – Some properties of openly ρ-continuous func- tions73
5.	Y. Povstenko – Harmonic impact on the surface of a half-plane in the framework of Time-Fractional Heat Conduction85
6.	B. Staruch, B. Staruch – X-maximal congruences and relevant sets for algebras93
7.	K. Troczka-Pawelec, I. Tyrala – On the alienation of the Cauchy equation and the Lagrange equation105
Part 1	III – Computer Science
1.	A. Kozakiewicz, M. Kurkowski – On Security Properties of RC5 cipher's Non Standard Modifications115

All papers submitted to Scientific Issues of Jan Długosz University in Częstochowa, Mathematics should be written in English, following the LATEX template to be found at

http://www.scientificissues.ajd.czest.pl.

Submissions should be made electronically to the following address:

sci.iss.ajd@ajd.czest.pl.

The .tex source file of the manuscript, along with its .pdf version, must be included with any submission. All figures should be converted to either .jpg or .pdf format.

A manuscript submitted to Scientific Issues of Jan Długosz University in Częstochowa is first considered by the Scientific Board. If the subject of the manuscript is not consistent with the journal profile or its text contains distinct defects, the article can be rejected.

Upon preliminary acceptance by the Scientific Board, the manuscript is sent to reviewers. The choice of reviewers is confidential. A review evaluates the manuscript and indicates unambiguously whether or not the manuscript can be published. When the required number of reviews have been received, usually two, the Editor will consider the experts' opinions and make an initial decision to accept, reject, or request a revision. In the case of the latter, the author should correct the manuscript according to reviewers' suggestions and resubmit the revised version. The Scientific Board reserves the right for making small corrections in the text of the final version of the manuscript. All manuscripts accepted for publication are prepared in both electronic and print versions.

Each submission of a manuscript to Scientific Issues of Jan Długosz University in Częstochowa, Mathematics implies the acceptance of the following requirements.

- Submission of a manuscript is taken to imply that it has not been previously published and that it is not being considered for publication elsewhere.
- Upon acceptance of a manuscript, the author is asked to transfer copyright to the publisher.

Please pay attention that in March 2016 the ISSN number was changed from ISSN 1896-0286 to ISSN 2450-9302.