MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

LUTSK NATIONAL TECHNICAL UNIVERSITY



TECHNOLOGICAL COMPLEXES

SCIENTIFIC JOURNAL

Annual № 1 (15) 2018

Founded in January 2010

Executive Editor prof., doctor of technical sciences, Honored Worker of Science and Technology of Ukraine – B. Palchevskyi

ISSN 2304-4519 eISSN 2312-0584

Lutsk National Technical University • 2018

Registered the State Committee for Information Policy, Television and Radio Broadcasting of Ukraine. State registration certificate KB № 16542–5014 P.

Publisher and Founder: Lutsk National Technical University

Editorial office address:

Ukraine, 43018, **Tel.:** (0332) 76-73-95

Lutsk, 56 Potebni str. E-mail: Tech_Kompl@ukr.net

Lutsk National Technical University

«Technological complexes» is a scientific specialized edition of Ukraine, where the results of dissertations for scientific degree of PhD and candidate of science can be published (resolution of the Presidium of Higher Attestation Commision of Ukraine № 1-05/2 23.02.2011;

Ministry of Education and Science of Ukraine order

№747, 13.07.2015)

Editorial board:

Ukraine

prof., doctor of technical sciences, Honored Worker of Science and Technology of Ukraine *B. Palchevskyi* (**Executive Editor**);

docent, candidate of technical sciences, *O. Krestianpol'* (**Executive Secretary**);

prof., doctor of technical sciences, Honored Worker of Science and Technology of Ukraine *B. Dyrnyak*;

prof., doctor of technical sciences, V. Maksymovych;

prof., doctor of technical sciences, Honored Worker of Science and Technology of Ukraine *Y. Kuznetsov*;

prof., doctor of technical sciences V. Rud';

prof., doctor of technical sciences, Honored Worker of Higher Education of Ukraine *Z. Stotsko*;

prof., doctor of technical sciences, Honored Worker of Science and Technology of Ukraine *V. Strutynskyi*;

prof., candidate of technical sciences, L. Yampolskyi;

prof., doctor of technical sciences, M. Yaroshevych;

prof. dr hab. inż. A. Świć (Poland);

prof. dr hab. inż. J. Lipski (Poland);

doctor of economic sciences, Z. Gerasymchuk (Poland);

prof., Dr. Ing. Popov Georgy (Bulgaria);

prof. Dr.-Ing. Dr. h. c. mult. Uwe Heisel (Germany);

prof. Ing., PhD Mikuláš Hajduk, (Slovakia);

prof. Dr. Emil Manoach (Bulgaria);

prof. Dr. Mehmed Emin Yüksel (Turkey).