

**PUBLISHER**  
**“NICOLAE BĂLCESCU”**  
**LAND FORCES ACADEMY**

Address: 3-5 Revoluției Street, Sibiu  
Tel.: 0269/432990, Fax: 0269/215554  
E-mail: office@armyacademy.ro  
E-mail: editura@armyacademy.ro  
Web: www.armyacademy.ro/editura

#### EDITORIAL BOARD

##### Editor-in-chief:

BG Prof. Eng. Ghiță BĂRSAN, PhD  
“Nicolae Bălcescu” Land Forces Academy, Sibiu

##### Editorial assistant:

Assist.Prof. Gabriel MĂNESCU, PhD; RA Maria-Lucia RUSU, PhD  
“Nicolae Bălcescu” Land Forces Academy, Sibiu

##### Technical editor:

Bianca BICHIȘ  
“Nicolae Bălcescu” Land Forces Academy, Sibiu

#### SCIENTIFIC REVIEWERS:

*Adi ADUMITROAIE*, Kaunas University of Technology, Lithuania;  
*Alexandru BABOȘ*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Dorel BADEA*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Thomas BAK*, University of Information Technology and Management, Rzeszów, Poland;  
*Ghiță BĂRSAN*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Paul BECHET*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Ioan BONDREA*, “Lucian Blaga” University, Sibiu, Romania;  
*Ștefania BUMBUC*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Vasile CĂRUȚAȘU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Lucian-Ionel CIOCA*, “Lucian Blaga” University, Sibiu, Romania;  
*Marius CIOCA*, “Lucian Blaga” University, Sibiu, Romania;  
*Nicolae Ionel CIUCĂ*, General Staff, Bucharest, Romania;  
*Ella Magdalena CIUPERCĂ*, National Institute for Research and Development in Informatics, Bucharest, Romania;  
*Carmen COMĂNICIU*, “Lucian Blaga” University, Sibiu, Romania;  
*Daniel-Sorin CONSTANTIN*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Anca DINICU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Teodora DRĂGHICI*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Virgil ENE-VOICULESCU*, “Mircea cel Bătrân” Naval Academy, Constanța, Romania;  
*Cătălin FEȚECĂU*, “Dunărea de Jos” University, Galați, Romania;  
*Elena FLORIȘTEANU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Laurian GHERMAN*, “Henri Coandă” Air Force Academy, Brașov, Romania;  
*Luminița GIURGIU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Antonio GONCALVES-COELHO*, Universidade Nova de Lisboa, Lisbon, Portugal;  
*Constantin GRIGORAȘ*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Marcel HARAĀAL*, Armed Forces Academy of General Milan Rastislav Štefánik, Liptovský Mikuláš, Slovak Republic;  
*Dumitru IANCU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Niculae IANCU*, “Mihai Viteazul” National Intelligence Academy, Bucharest, Romania;  
*Florin ILIE*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Lucian ISPAS*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Adrian Liviu IVAN*, “Mihai Viteazul” National Intelligence Academy, Bucharest, Romania;  
*Tomasz JALOWIEC*, War Studies University, Warsaw, Poland;  
*Claudiu Vasile KIFOR*, “Lucian Blaga” University, Sibiu, Romania;  
*Marek KULCZYCKI*, General Tadeusz Kosciuszko Military Academy of Land Forces, Wrocław, Poland;  
*Adrian LESENCIUC*, “Henri Coandă” Air Force Academy, Brașov, Romania;  
*Martin MACKO*, University of Defence, Brno, Czech Republic;  
*Jaromír MAREŠ*, University of Defence, Brno, Czech Republic;

*Šárka MAYEROVÁ*, University of Defence, Brno, Czech Republic;  
*Simona MICLĂUȘ*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Liviu-Nicolae MIHĂESCU*, “Lucian Blaga” University, Sibiu, Romania;  
*Gabriela MIHĂILĂ-LICĂ*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Marius MILĂNDRU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Nicolae MORO*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Dănuș MOȘTEANU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Emanoil MUSCALU*, “Lucian Blaga” University, Sibiu, Romania;  
*Mihai-Marcel NEAG*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Pavel NECAS*, University of Security Management, Kosice, Slovak Republic;  
*Romana OANCEA*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Constantin OPREAN*, “Lucian Blaga” University, Sibiu, Romania;  
*Pavel OTRISAL*, University of Defence, Brno, Czech Republic;  
*Marioara PATEȘAN*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*András PATYI*, National University of Public Service, Budapest, Hungary;  
*Sîmbu-Mihai PETRIȘOR*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Elitsa PETROVA*, “Vasil Levski” National Military University, Veliko Tamovo, Bulgaria;  
*Sorin PINZARIU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Toma PLEȘANU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Ioan-Gabriel POPA*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Stelian POPESCU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Karl PRONHAGL*, Theresian Military Academy, Wiener Neustadt, Austria;  
*Ștefan Eugen PRUNĂ*, “Alexandru Ioan Cuza” Police Academy, Bucharest, Romania;  
*Aurelian RAȚIU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Ion ROCEANU*, “Carol I” National Defence University, Bucharest, Romania;  
*Cristina Teodora ROMAN*, “Alexandru Ioan Cuza” University, Iași, Romania;  
*Benoni SFĂRLOG*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Miroslaw SMOLAREK*, General Tadeusz Kosciuszko Military Academy of Land Forces, Wrocław, Poland;  
*Daniel SOLESCU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Leontin STANCIU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Robert STĂNCULESCU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Róbert SZABOLCSI*, Obuda University, Budapest, Hungary;  
*Ramona TODERICIU*, “Lucian Blaga” University, Sibiu, Romania;  
*George-Marius ȚICAL*, “Alexandru Ioan Cuza” Police Academy, Bucharest, Romania;  
*Paul TUDORACHE*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Gheorghe UDEANU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Ioan VIRCA*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Mircea VLADU*, “Nicolae Bălcescu” Land Forces Academy, Sibiu, Romania;  
*Mariusz WIATR*, General Tadeusz Kosciuszko Military Academy of Land Forces, Wrocław, Poland.

ISSN 2247-8396

ISSN-L = 1224-5178

Scientific Bulletin is indexed  
in several International Databases.

For further information please visit

<https://www.armyacademy.ro/engleza/buletin.php>

**COPYRIGHT © 2019**

**First issued in 1996**

All rights reserved. No part of this publication  
may be reproduced without the prior permission of  
“Nicolae Bălcescu” Land Forces Academy Publishing House.

*The authors take full responsibility  
of the scientific content of their articles.*