ESKİŞEHİR TECHNICAL UNIVERSITY
JOURNAL OF SCIENCE AND TECHNOLOGY
A – Applied Sciences and Engineering

Volume 19  Number 4  - 2018
Eskişehir Technical University Journal of Science and Technology A - Applied Sciences and Engineering (formerly Anadolu University Journal of Science and Technology A - Applied Sciences and Engineering) is an peer-reviewed and refereed international journal by Eskişehir Technical University. Since 2000, it has been regularly published and distributed biannually and it has been published quarterly and electronically only since 2016.

Manuscripts submitted for publication are analyzed in terms of scientific quality, ethics and research methods in terms of its compliance by the Editorial Board representatives of the relevant areas. Then, the abstracts of the appropriate articles are sent to two different referees with a well-known in scientific area. If the referees agree to review the article, full text in the framework of the privacy protocol is sent. In accordance with the decisions of referees, either directly or corrected article is published or rejected. Confidential reports of the referees in the journal archive will be retained for ten years. All post evaluation process is done electronically on the internet. Detailed instructions to authors are available in each issue of the journal.

Eskişehir Technical University holds the copyright of all published material that appear in Eskişehir Technical University Journal of Science and Technology A - Applied Sciences and Engineering.

"Anadolu Üniversitesi Bilim ve Teknoloji Dergisi A - Uygulamalı Bilimler ve Mühendislik (Anadolu University Journal of Science and Technology A - Applied Sciences and Engineering)" published within Anadolu University started to be published within Eskişehir Technical University which was established due to statute law 7141. Hence, the name of the journal is changed to "Eskişehir Teknik Üniversitesi Bilim ve Teknoloji Dergisi A - Uygulamalı Bilimler ve Mühendislik (Eskişehir Technical University Journal of Science and Technology A - Applied Sciences and Engineering)".

Indexed by DOAJ - Directory of Open Access Journals, EBSCO and ULAKBIM

ISSN: 2667-4211
Volume: 19 / Number: 4 / 2018

OWNER
Tuncay DÖGEROĞLU, The Rector of Eskişehir Technical University

EDITORIAL BOARD
Ersin YÜCEL, Editor in Chief
Yunus ÖZDEMİR, Co-Editor in Chief
Hanife APAYDIN ÖZKAN, Co-Editor in Chief

LANGUAGE EDITOR-ENGLISH
Barış ERBAŞ
Sinem KAHVECİOĞLU

SECTION EDITORS
Dilek AK (Anadolu University, Turkey)
Kadri Can ATLI (Eskişehir Technical University, Turkey)
Uğur AVDAN (Eskişehir Technical University, Turkey)
Erhan AYAS (Eskişehir Technical University, Turkey)
Aydın AYBAR (Eskişehir Technical University, Turkey)
Recep BAKIŞ (Eskişehir Technical University, Turkey)
Müfide BANAR (Eskişehir Technical University, Turkey)
Murat BAYDOĞAN (İstanbul Technical University)
Henry BERGMAN (Anhalt University, Germany)
Ayşe H. BİLGE (Kadir Has University, Turkey)
Feodor M. BORODICH (Cardiff University, United Kingdom)
Karel BOUZEK (Institute of Chemical Technology, Czechia)
Berrin BOZAN (Eskişehir Technical University, Turkey)
Harun BÖCÜK (Eskişehir Technical University, Turkey)
Steven BUTT (Western Michigan University, USA)
Vakif CAFER (Eskişehir Technical University, Turkey)
Müjdat ÇAĞLAR (Eskişehir Technical University, Turkey)
Osman ÇELİK (Eskişehir Osmangazi University, Turkey)
Yunus Ali ÇENGEL (Adnan Menderes University, Turkey)
Hüseyin ÇİMENOĞLU (İstanbul Technical University)
Eftade GAGA (Eskişehir Technical University, Turkey)
Serdar GÖNCÜ (Eskişehir Technical University, Turkey)
Zerrin AŞAN GREENACRE (Eskişehir Technical University, Turkey)
Ram GUPTA (Pittsburg State University, USA)
Cihan KALELİ (Eskişehir Technical University, Turkey)
Alpayat KARA (Eskişehir Technical University, Turkey)
Refail KASIMBEYLİ (Eskişehir Technical University, Turkey)
Süleyman KAYTAKOĞLU (Eskişehir Technical University, Turkey)
Kateryna KAZHAN (National Aviation University, Ukraine)
Sabihah KOCA (Eskişehir Osmangazi University, Turkey)
Ali Savas KİPARAL (Anadolu University, Turkey)
Semra KURAMA (Eskişehir Technical University, Turkey)
Dilek Funda KURTULUŞ (METU, Turkey)
Susumu NII (Nagoya University, Japan)
Andrea NOBILI (The University of Modena and Reggio Emilia, Italy)
Asiya Safa ÖZCAN (Eskişehir Technical University, Turkey)
Yunus ÖZDEMİR (Eskişehir Technical University, Turkey)
İsmail Özgüz ÖZER (Eskişehir Technical University, Turkey)
Hanife Apaydın ÖZKAN (Eskişehir Technical University, Turkey)
Kemal ÖZKAN (Eskişehir Osmangazi University, Turkey)
Emrah PEKKAN (Eskişehir Technical University, Turkey)
Danila PRIKAZCHIKOV ( Keele University, United Kingdom)
Birgal ŞENOĞLU (Ankara University, Turkey)
Mustafa TOMBUL (Eskişehir Technical University, Turkey)
Önder TURAN (Eskişehir Technical University, Turkey)
Hakkı Ulaş ÜNAL (Eskişehir Technical University, Turkey)

TYPESET
Handan YİĞİT
ABOUT
Eskişehir Technical University Journal of Science and Technology A - Applied Sciences and Engineering (formerly Anadolu University Journal of Science and Technology A - Applied Sciences and Engineering) is an peer-reviewed and refereed international journal by Eskişehir Technical University. Since 2000, it has been regularly published and distributed biannually and it has been published quarterly and electronically only since 2016.

- The journal accepts only ENGLISH language manuscripts.
- The journal is indexed by EBSCO, DOAJ and ULAKBIM.

AIM AND SCOPE
The journal publishes high quality original research papers in the field of engineering and applied science. Special Issues devoted to important topics in science and technology will occasionally be published. The journal publishes research papers in the fields of applied science and technology such as Physics, Biology, Mathematics, Statistics, Chemistry and Chemical Engineering, Environmental Sciences and Engineering, Civil Engineering, Earth and Atmospheric Sciences, Electrical and Electronical Engineering, Computer Science and Informatics, Materials Sciences and Engineering, Mechanical Engineering, Mining Engineering, Industrial Engineering, Aeronautics and Astronautics, Health Sciences, Pharmaceutical Sciences, and so on.

PEER REVIEW PROCESS
Manuscripts are first reviewed by the editorial board in terms of its its journal’s style rules scientific content, ethics and methodological approach. If found appropriate, the manuscript is then send to at least two renown referees by editor. The decision in line with the referees may be an acceptance, a rejection or an invitation to revise and resubmit. Confidential review reports from the referees will be kept in archive. All submission process manage through the online submission systems.

OPEN ACCESS POLICY
This journal provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge.
Copyright notice and type of licence: CC BY-NC-ND.
The journal doesn’t have Article Processing Charge (APC) or any submission charges.

AUTHOR GUIDELINES

All manuscripts must be submitted electronically. You will be guided stepwise through the creation and uploading of the various files. There are no page charges. Papers are accepted for publication on the understanding that they have not been published and are not going to be considered for publication elsewhere. Authors should certify that neither the manuscript nor its main contents have already been published or submitted for publication in another journal. We ask a signed Copyright Form to start the evaluation process. After a manuscript has been submitted, it is not possible for authors to be added or removed or for the order of authors to be changed. If authors do so, their submission will be cancelled.

Manuscripts may be rejected without peer review by the editor-in-chief if they do not comply with the instructions to authors or if they are beyond the scope of the journal. After a manuscript has been accepted for publication, i.e. after referee-recommended revisions are complete, the author will not be permitted to make any changes that constitute departures from the manuscript that was accepted by the editor. Before publication, the galley proofs are always sent to the authors for corrections. Mistakes or omissions that occur due to some negligence on our part during final printing will be rectified in an errata section in a later issue.

This does not include those errors left uncorrected by the author in the galley proof. The use of someone else’s ideas or words in their original form or slightly changed without a proper citation is considered plagiarism and will not be tolerated. Even if a citation is given, if quotation marks are not placed around words taken directly from another author’s work, the author is still guilty of plagiarism. All manuscripts received are submitted to iThenticateR, a plagiarism checking system, which compares the content of the manuscript with a vast database of web pages and academic publications. Manuscripts judged to be plagiarised or self-plagiarised, based on the iThenticateR report or any other source of information, will not be considered for publication.

Preparation of Manuscript

Style and Format: Manuscripts should be single column by giving one-spaced with 2.5-cm margins on all sides of the page, in Times New Roman font (font size 11). Every page of the manuscript, including the title page, references, tables, etc., should be numbered. All copies of the manuscript should also have line numbers starting with 1 on each consecutive page.

Manuscripts must be upload as word document (*.doc, *.docx vb.). Please avoid uploading texts in *.pdf format.

Manuscripts should be written in English.

Symbols, Units and Abbreviations: Standard abbreviations and units should be used; SI units are recommended. Abbreviations should be defined at first appearance, and their use in the title and abstract should be avoided. Generic names of chemicals should be used. Genus and species names should be typed in italic or, if this is not available, underlined.
Please refer to equations with capitalisation and unabbreviated (e.g., as given in Equation (1)).

**Manuscript Content:** Articles should be divided into logically ordered and numbered sections. Principal sections should be numbered consecutively with Arabic numerals (1. Introduction, 2. Formulation of problem, etc.) and subsections should be numbered 1.1., 1.2., etc. Do not number the Acknowledgements or References sections. The text of articles should be, if possible, divided into the following sections: Introduction, Materials and Methods (or Experimental), Results, Discussion, and Conclusion.

**Title and contact information**
The first page should contain the full title in sentence case (e.g., Hybrid feature selection for text classification), the full names (last names fully capitalised) and affiliations (in English) of all authors (Department, Faculty, University, City, Country, E-mail), and the contact e-mail address for the clearly identified corresponding author.

**Abstract**
The abstract should provide clear information about the research and the results obtained, and should not exceed 300 words. The abstract should not contain citations and must be written in Times New Roman font with font size 9.

**Keywords**
Please provide 3 to 5 keywords which can be used for indexing purposes.

**Introduction**
The motivation or purpose of your research should appear in the “Introduction”, where you state the questions you sought to answer, and then provide some of the historical basis for those questions.

**Methods**
Provide sufficient information to allow someone to repeat your work. A clear description of your experimental design, sampling procedures, and statistical procedures is especially important in papers describing field studies, simulations, or experiments. If you list a product (e.g., animal food, analytical device), supply the name and location of the manufacturer. Give the model number for equipment used.

**Results**
Results should be stated concisely and without interpretation.

**Discussion**
Focus on the rigorously supported aspects of your study. Carefully differentiate the results of your study from data obtained from other sources. Interpret your results, relate them to the results of previous research, and discuss the implications of your results or interpretations.

**Conclusion**
This should state clearly the main conclusions of the research and give a clear explanation of their importance and relevance. Summary illustrations may be included.

**Acknowledgments**
Acknowledgments of people, grants, funds, etc. should be placed in a separate section before the reference list. The names of funding organizations should be written in full.
References
Citations in the text should be identified by numbers in square brackets. The list of references at the end of the paper should be given in order of their first appearance in the text or in alphabetical order according to the surname of the first author. All authors should be included in reference lists unless there are 10 or more, in which case only the first 10 should be given, followed by ‘et al.’. Do not use individual sets of square brackets for citation numbers that appear together, e.g., [2, 3, 5–9], not [2], [3], [5–9]. Do not include personal communications, unpublished data, websites, or other unpublished materials as references, although such material may be inserted (in parentheses) in the text. In the case of publications in languages other than English, the published English title should be provided if one exists, with an annotation such as “(article in Turkish with an abstract in English)”. If the publication was not published with an English title, cite the original title only; do not provide a self-translation. References should be formatted as follows (please note the punctuation and capitalisation):

Journal articles
Journal titles should be abbreviated according to ISI Web of Science abbreviations.


Books


Chapters in books

Conference proceedings

Theses
Boynukalın Z. Emotion analysis of Turkish texts by using machine learning methods. MSc, Middle East Technical University, Ankara, Turkey, 2012.

Tables and Figures
All illustrations (photographs, drawings, graphs, etc.), not including tables, must be labelled “Figure.” Figures must be submitted in the manuscript.
All tables and figures must have a caption and/or legend and be numbered (e.g., Table 1, Figure 2), unless there is only one table or figure, in which case it should be labelled “Table” or “Figure” with no numbering. Captions must be written in sentence case (e.g., Macrosopic appearance of the samples.). The font used in the figures should be Times New Roman with 9 pt. If symbols such as ×, μ, η, or ν are used, they should be added using the Symbols menu of Word.

All tables and figures must be numbered consecutively as they are referred to in the text. Please refer to tables and figures with capitalisation and unabbreviated (e.g., “As shown in Figure 2...”, and not “Fig. 2” or “figure 2”).

The resolution of images should not be less than 118 pixels/cm when width is set to 16 cm. Images must be scanned at 1200 dpi resolution and submitted in jpeg or tiff format. Graphs and diagrams must be drawn with a line weight between 0.5 and 1 point. Graphs and diagrams with a line weight of less than 0.5 point or more than 1 point are not accepted. Scanned or photocopied graphs and diagrams are not accepted.

Figures that are charts, diagrams, or drawings must be submitted in a modifiable format, i.e. our graphics personnel should be able to modify them. Therefore, if the program with which the figure is drawn has a “save as” option, it must be saved as *.ai or *.pdf. If the “save as” option does not include these extensions, the figure must be copied and pasted into a blank Microsoft Word document as an editable object. It must not be pasted as an image file (tiff, jpeg, or eps) unless it is a photograph.

Tables and figures, including caption, title, column heads, and footnotes, must not exceed 16 × 20 cm and should be no smaller than 8 cm in width. For all tables, please use Word’s “Create Table” feature, with no tabbed text or tables created with spaces and drawn lines. Please do not duplicate information that is already presented in the figures.
# CONTENTS

**SINGLE BANK DUAL-PORT MEMORY-BASED FFT FOR FIELD PROGRAMMABLE GATE ARRAYS**  
E. Seke, Z. Kaya ................................................................................................................................. 796

**NATURAL SEISMIC PROTECTION PROPERTIES OF HISTORICAL “WALLED OBEISK” STRUCTURE IN ISTANBUL: MODELING-NUMERICAL APPROACH**  
S. Tuhta ........................................................................................................................................... 805

**IMPLEMENTATION OF LONG-PERIOD FIBER GRATINGS FOR REFRACTIVE INDEX MEASUREMENT OF LIQUIDS**  
C. İde, K. Y. Aldoğan ......................................................................................................................... 815

**LONGITUDINAL STABILITY ANALYSIS OF A UAV UNDER THE UNCERTAINTY OF TWO STABILITY DERIVATIVES**  
U. Özdemir, M. S. Kavsaoglu, Z. Öznalbant, Ü. Kaynak .................................................................... 831

**A NEW NUMERICAL METHOD FOR SOLVING DELAY INTEGRAL EQUATIONS WITH VARIABLE BOUNDS BY USING GENERALIZED MOTT POLYNOMIALS**  
Ö. K. Kürkçü ..................................................................................................................................... 844

**HERMAL STRESS ANALYSIS OF AXIALLY LAYERED FUNCTIONALLY GRADED BEAMS USING FINITE ELEMENT AND TAGUCHI METHODS**  
S. Evran ............................................................................................................................................... 858

**LOW FREQUENCY ANTIPLANE SHEAR VIBRATIONS OF A THREE-LAYERED ELASTIC PLATE**  
B. Erbaş ............................................................................................................................................... 867

**UPCONVERSION LUMINESCENCE PROPERTIES OF GA\textsubscript{2}O\textsubscript{3}: YB\textsuperscript{3+}, ER\textsuperscript{3+} NANOPARTICLES: EFFECTS OF CALCINATION TEMPERATURE AND DOPANT CONCENTRATION**  
A. Dulda ............................................................................................................................................. 880

**OPTIMIZATION OF SELECTIVE CU\textsuperscript{2+} ADSORPTION WITHIN THE MULTI-ION SYSTEM BY USING ACTIVATED CARBON PREPARED BY ULTRASOUND**  
B. Başar, E. Şayan ............................................................................................................................ 893

**COMPARISON OF PROVINCES OF TURKEY IN TERMS OF ACCESSING HEALTH CARE SERVICES BY USING DIFFERENT CLUSTERING ALGORITHMS**  
H. Yıldırım ......................................................................................................................................... 907

**ATR–FTIR SPECTROSCOPY COMBINED WITH CHEMOMETRICS FOR RAPID CLASSIFICATION OF EXTRA VIRGIN OLIVE OILS AND EDIBLE OILS FROM DIFFERENT CULTIVARS AVAILABLE ON THE TURKISH MARKETS**  
F. N. Arslan ....................................................................................................................................... 926

**ASSESSMENT OF RADIO SPECTRUM PROFILE IN NIGERIA USING MULTI-BAND AND MULTI-LOCATION RADIO SPECTRUM OCCUPANCY MEASUREMENTS**  
J. J. Popoola, U. N. Otua .................................................................................................................... 948
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAMMETRIC DETERMINATION OF ESTRADIOL IN MILK AND PHARMACEUTICALS BASED ON FUMED-SILICA MODIFIED CARBON PASTE ELECTRODE</td>
<td>A. Özcan, D. Topçuoğulları, A. Atılır, Özcan</td>
<td>963</td>
</tr>
<tr>
<td>INVESTIGATION OF FOCUSED ION BEAM IMPLANTATION PROFILE OF Ga+ IONS FOR APPLICATIONS IN SILICON PHOTONICS</td>
<td>F. Ay</td>
<td>976</td>
</tr>
<tr>
<td>READY MIXED CONCRETE CONSTITUENT MATERIALS; PLASTICIZING CHEMICAL ADMIXTURES AND EFFECTS ON FRESH AND HARDENED PROPERTIES</td>
<td>E. Arıöz, Ö. Arıöz</td>
<td>982</td>
</tr>
<tr>
<td>FINITE ELEMENT ANALYSIS OF NANOINDENTATION ON NANOLAMINATED MATERIALS</td>
<td>S. Özerinç</td>
<td>991</td>
</tr>
<tr>
<td>LANTHANIDE DOPED BISMUTH TUNGSTATES: AN INVESTIGATION FOR LED AND PHOTOCATALYSIS APPLICATIONS</td>
<td>C. Yılmaz Akkaya, U. Ünal</td>
<td>1001</td>
</tr>
<tr>
<td>XRD, OPTICAL AND VIBRATIONAL PROPERTIES OF ANNEALED CADMIUM SULFIDE FILMS</td>
<td>S. Aksay</td>
<td>1013</td>
</tr>
<tr>
<td>VISION BASED CONTROL OF GANTRY CRANE SYSTEM</td>
<td>A. Okubanjo, O. Oyetola, O. Adekomaya</td>
<td>1023</td>
</tr>
</tbody>
</table>