

# **Nigerian Journal of Technological Development**

**Volume 21, Number 4, December 2024.**

(Scopus, AJOL, Google Scholar, DOAJ, HINARI)

A Quarterly Publication of the Faculty of Engineering and Technology,  
University of Ilorin, Ilorin, Nigeria.

Editor-in-Chief

**Prof. I. I. Ahmed**

**2024**

## EDITORIAL BOARD

### *Dean of Faculty*

**Engr. Prof. J. K. Odusote**

Department of Materials & Metallurgical Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Managing Editor*

**Dr. A. O. Otuoze**

Department of Chemical Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Copy Editor*

**Engr. Prof. (Mrs) O. A. A. Eletta**

Department of Electrical & Electronics Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Copy Editor*

**Engr. Prof. (Mrs.) N. T. Surajudeen-Bakinde**

Department of Electrical and Electronics Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Production Editor*

**Engr. M. A. Amoloye**

Department of Chemical Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Editor-in-Chief*

**Prof. I. I. Ahmed**

Department of Materials & Metallurgical  
Engineering, University of Ilorin, Ilorin, Nigeria.

### *Deputy Editor-in-Chief*

**Dr. T. D. Akpenpuun**

Department of Agricultural and Biosystems  
Engineering, University of Ilorin, Ilorin, Nigeria.

### *Copy Editor*

**Engr. Dr. H. A. Ajimotokan**

Department of Mechanical Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Copy Editor*

**Engr. Prof. M. O. Sunmonu**

Department of Electrical and Electronics  
Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Treasurer*

**Engr. Dr. (Mrs) O. A. Mokuolu**

Department of Water Resources and Environmental  
Engineering, University of Ilorin, Ilorin, Nigeria

## SECTION EDITORS

### *Section A: Agricultural and Biosystems, Chemical, Petroleum Engineering, and Geology*

**Dr. H. U. Hambali**

Department of Chemical Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Section B: Electrical and Electronics, and Computer Engineering; Applied Mathematics; Computer Science*

**Dr. A. S. Afolabi**

Department of Electrical & Electronics Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Section C: Food, Water Resources and Environmental Engineering; Applied Sciences*

**Engr. Dr. T. D. Akpenpuun**

Department of Food Engineering,  
University of Ilorin, Ilorin, Nigeria.

### *Section D: Materials & Metallurgical, Mechanical, and Civil Engineering; Geophysics*

**Engr. Dr. J. A. Adebisi**

Department of Materials & Metallurgical  
Engineering, University of Ilorin, Ilorin, Nigeria.

**Dr. K. O. Abdulrahman**  
Department of Mechanical Engineering,  
University of Ilorin, Ilorin, Nigeria.

**Dr. O. Y. Babatunde**  
Department of Civil Engineering,  
University of Ilorin, Ilorin, Nigeria.

**Section E: Biomedical Engineering**  
**Engr. Dr. S. A. Yahaya**  
Department of Biomedical Engineering,  
University of Ilorin, Ilorin, Nigeria

**Guest Editor**  
**Dr. E. O. Babatunde**  
Department of Chemical Engineering, University of  
Ilorin, Ilorin, Nigeria.

**Guest Editor**  
**Dr. S. I. Talabi**  
Manufacturing Science Division,  
Oak Ridge National Laboratory, Knoxville, TN, USA

**Guest Editor**  
**Dr. B. Jimada-Ojuolape**  
Department of Electrical and Computer Engineering,  
University of Ilorin, Ilorin, Nigeria

**Guest Editor**  
**Prof. Y. Mijinyawa**  
Department of Agricultural and Biosystems  
Engineering, University of Ilorin, Ilorin, Nigeria.

**Editorial Assistant**  
**Mrs. A. A. Adeboboye**  
FET Journal Office,  
Department of Materials & Metallurgical Engineering,  
University of Ilorin, Ilorin, Nigeria.

## EDITORIAL ADVISORY BOARD

**Prof. J. O. Ojo**  
Dept. of Electrical and Computer  
Engineering,  
Tennessee Technological University,  
Cookeville, Tennessee, USA.

**Prof. Foluso Ladehinde**  
Dept. of Mechanical Engineering,  
State University of New York,  
Stony Brook, New York, USA.

**Prof. Y. A. Jimoh**  
Dept. of Civil Engineering,  
University of Ilorin,  
Ilorin, Nigeria.

**Prof. J. A. Olorunmaiye**  
Dept. of Mechanical  
Engineering, University of Ilorin,  
Ilorin, Nigeria.

**Prof. B. F. Sule**  
Dept. of Water Resources and  
Environmental Engineering,  
University of Ilorin, Ilorin,  
Nigeria.

**Prof. Samuel John**  
Dept. of Mechanical Engineering,  
Namibia University of Science &  
Technology, Windhoek, Namibia.

**Prof. O. Adegbenro**  
Dept. of Electrical/Electronics  
Engineering,  
University of Lagos, Akoka, Nigeria.

**Prof. S. M. Adedayo**  
Dept. of Mechanical Engineering,  
University of Ilorin, Ilorin,  
Nigeria.

**Prof. J. A. Omoleye**  
Dept. of Chemical Engineering,  
Covenant University,  
Ota, Ogun State, Nigeria.

**Prof. A. M. Olaniyan**  
Dept. of Agricultural & Bio-Resource  
Engineering,  
Federal University Oye,  
Ekiti, Nigeria.

**Dr. Olugbenga Mejabi**  
Dept. of Mechanical Engineering,  
Wayne State University,  
Detroit, Michigan,  
USA.

**Dr. K. B. Mustapha**  
Dept. of Mechanical, Materials and  
Manufacturing Engineering,  
University of Nottingham  
Malaysia Campus,  
Selangor Darul Ehsan, Malaysia.

**Prof. J. O. Omolehin**  
Dept. of Mathematics,  
Federal University,  
Lokoja, Nigeria.

**Dr James Titiloye**  
Dept. of Chemical &  
Environmental Engineering,  
Swansea University  
Swansea, United Kingdom.

**Prof. G. A. Bakare**  
Dept. of Electrical & Electronics  
Engineering,  
Abubakar Tafawa Balewa  
University, Bauchi, Nigeria.

**Prof. A. O. Ogunlela**  
Dept. of Agricultural & Biosystems  
Engineering,  
University of Ilorin, Ilorin, Nigeria.

**Prof. S. A. Abdulkareem**  
Dept. of Chemical Engineering,  
University of Ilorin, Ilorin,  
Nigeria.

**Prof. Victor Kamara**  
Dept. of Civil and Environmental  
Engineering, Namibia University of  
Science & Technology, Windhoek,  
Namibia.

**Dr. Edris Pouresmaeil**  
Dept. of Electrical Engineering and  
Automation,  
Aalto University,  
Espoo, Finland.

**Dr. S. S. Zakariyah**  
College of Engineering and  
Technology,  
University of Derby, Derby DE22  
3AW, UK.

**Dr. P. Sanjeevikumar**  
School of Electrical & Electronics  
Engineering,  
Dublin Institute of Technology  
Kevin Street, Dublin-8, Ireland.

**Dr. M. Y. S. Hamid**  
School of Chemical and Energy  
Engineering,  
Universiti Teknologi Malaysia,  
Skudai, Johor, Malaysia.

**Dr. A. M. Aliyu**  
Dept. of Engineering and  
Technology,  
University of Huddersfield,  
Queensgate HD1 3DH, UK.

**Dr. T. A. Jumani**  
Dept. of Electrical Engineering,  
SZAB Campus, Mehran University  
of Engineering and Technology,  
Khairpur Mirs, Pakistan.

**Dr. Umbrin Sultana**  
Dept. of Electrical Engineering,  
NED University of Engineering &  
Technology, Karachi, Pakistan.

### Annual Subscription

2024 rates including postage are:

	Nigeria (NGN)	Other Africa Countries (USD)	Other Countries (USD)
Individual	5,000	40	50
Institution	8,000	70	80

### Correspondence

Nigerian Journal of Technological Development  
Dean Office, Faculty of Engineering & Technology, University  
of Ilorin, Ilorin, Nigeria.

E-mail addresses: [njtd\\_editor\\_chief@unilorin.edu.ng](mailto:njtd_editor_chief@unilorin.edu.ng); [njtd\\_man\\_editor@unilorin.edu.ng](mailto:njtd_man_editor@unilorin.edu.ng)

Journal Homepages: <http://www.njtd.com.ng>; <http://www.journal.njtd.com.ng>  
<http://www.ajol.info/index.php/njtd/index>

### Copyright & Licensing

The Nigerian Journal of Technological Development (NJTD) allows authors to retain the copyright of their papers without restrictions. Articles are published under the terms of a Creative Commons license CC BY-SA which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

First published in 1989. Published by the Faculty of Engineering & Technology, University of Ilorin, Ilorin, Nigeria.

## NJTD Submission Guidelines

### Aim and Scope

The Nigerian Journal of Technological Development (NJTD) publishes high-quality articles focusing on all aspects of Engineering and Applied Sciences. All manuscripts will be double blind peer-reviewed and if found suitable, published according to the subject matter, either as **full-length research articles** or **review papers**. Our publications are scheduled for March, June, September and December.

### Preparation of the Manuscript

Manuscript should be written in English Language and typed in 12-point font size using Times New Roman in double spacing on A4 paper. A margin of 25 mm should be left at the sides. The paper should be between 12 and 20 pages, including figures and tables. The text should be in single-column format. The main paper should be a blind manuscript i.e. without Author(s)' details.

### Title Page

The title page should contain **only** the title of the article, authors' names and contact details such as institutional affiliations, corresponding author's e-mail address and phone number. The page is also to contain the abstract of the article and the list of three suggested reviewers. With their affiliations and contact email addresses. The title page should be uploaded by selecting "Title Page" on the Author's portal during the submission process. The file containing this document should be named **Title\_Page**.

### The Anonymised Manuscript (Blind Manuscript)

The manuscript should contain the title of the article, the abstract, and five or six keywords. However, it must **NOT** contain name(s), and address(es) of author(s), and e-mail addresses and telephone number of the corresponding author. This information will be supplied on the online submission platform in addition to the title page. This file should be named **Manuscript** and to be uploaded on the portal by selecting "Article Text" during submission process. The manuscript should be organised under the following headings:

#### The Article Title

A good title should be concise, accurate, and informative, and should inform the reader exactly what the article is all about. It is vital to incorporate some relevant keywords in your title to make your article more discoverable in online searches. Please note that the article title should not exceed seventeen (17) words and should be in title case letters.

#### **ABSTRACT**

The abstract is a brief summary of the research work, which is usually in a paragraph. It should clearly define the problems of study, methodology adopted, results and findings. Citation of previous works are not allowed in the abstract. Abstracts are expected to be stand-alone and capable of providing fast and complete, yet short information about the article. Articles to be

submitted to NJTD must have a maximum of 250 words. Authors should pay attention to this word limit!

### **KEYWORDS**

Five or six relevant keywords, separated by comma, should be provided in the manuscript.

### **SYMBOLS, ABBREVIATIONS AND UNITS**

Symbols and abbreviations should be defined where first mentioned. If the symbols are many, a “Notation” defining the symbols must be included between the abstract and Introduction. SI units should be used except in situations where calibrations and measurements are in other units.

## **I. INTRODUCTION**

This should include the background to the study, a brief review of literature and clearly-stated objectives. The last paragraph should delve into the contributions of the work and structure of the rest of the paper.

## **II. THEORETICAL ANALYSIS**

Mathematical principles or theories used should be included as appropriate.

## **III. MATERIALS AND METHODS/METHODOLOGY/EXPERIMENTAL PROCEDURE**

This section should include apparatus and equipment setup, work materials, design, experimental methods, as applicable.

### *A. Sub-section One*

The heading of a sub-section should be in title case letters as illustrated here. In other words, the first letter of an important word must be in upper case letter.

### *B. Sub-section Two*

The introductory statements should be in the normal 12-point font size. A sub-section may have sub sub-section which are illustrated below in 1) and 2).

#### *1) Sub sub-section one*

A sub sub-section heading should have a sentence case in which case it is only the first letter of the heading that would be in upper case letter. Others will be in lower case letters.

#### *2) Sub sub-section two*

Same as 1) above.

## **IV. RESULTS AND DISCUSSION**

Results could be presented in descriptive, tabular or graphical form. Information presented in tables should not be repeated as figures. Discussion should be focused on the interpretation of

experimental findings. This may be broken down into different sub-sections and sub subsections as discussed in Section III above.

#### *A. Tables and Figures*

Tables and Figures should be placed as close as possible to the first place of reference in the text. References should be made to all the tables and figures and each must be discussed in the manuscript. Authors should endeavour to supply very high quality figures. Editable charts must be provided while “copy and paste” figures must be avoided as much as possible.

It should be noted that good quality articles can be denied publication in NJTD on account of poor quality figures and tables.

#### *B. Equations*

All equations, whether mathematical or chemical, are considered as text and should be typed using Microsoft Equation 3.0 or MathType in Word. These equations should be numbered sequentially and should be referenced and discussed in the text. Equation numbers should be enclosed in parentheses and made to align towards the right hand margin of the text. If detailed derivation is needed, it is to be placed in an appendix. Each equation should appear on its own line and should be indented from the left margin of the text.

### V. CONCLUSION

The conclusion should be a brief summary of findings. It should clearly state the contributions, relevance of the findings and recommendations, as appropriate. It is usually reported in the past tense form.

### AUTHOR CONTRIBUTIONS

For transparency, authors should submit an author statement outlining individual contributions to the paper using the following roles: Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing - original draft; Writing - review & editing.

For example, **S. O. Sanni**: Conceptualization, Methodology, Software, Validation, Writing – original draft, Writing – review & editing. **M. F. Akorede**: Supervision, Writing – original draft, Writing – review & editing. **G. A. Olarinoye**: Writing – review & editing.

### ACKNOWLEDGEMENT(S)

Acknowledgement of the individuals, institutions or research granting body who provided help during the research should be collated in a separate section at the end of the article before the references and should, therefore, not be included on the title page, as a footnote to the title or otherwise.

### REFERENCES

The Harvard system (alphabetical listing) of referencing should be used in the body of the manuscript while only essential references must be cited and listed. Examples of citing

references include: Omeiza (2012) or (Omeiza, 2012) as appropriate; Olaniyan and Oje (2002) or (Olaniyan and Oje, 2002) as appropriate; Ogunlela *et al* (2006) or (Ogunlela *et al*, 2006) as appropriate. Examples of listing references are as follows:

### ***Books***

**Adedayo, S. M. (2000).** Graphics for Engineers. Indemac Publishers, Ilorin, Nigeria.

### ***Journals***

#### One Author

**Omeiza, I. O. A. (2012).** An Investigation on the Problem of Thinning in Fingerprint Processing. Nigerian Journal of Technological Development, 9 (1): 26 - 36.

#### Two Authors

**Olaniyan, A. M. and Oje, K. (2002).** Some Aspects of the Mechanical Properties of Shea Nuts. Biosystems Engineering, 81 (4): 413-420.

#### Three Authors

**Ogunlela, A. O.; M. Y. Kasali and I. E. Ahaneku. (2006).** Hydrologic Characterization of the National Centre for Agricultural Mechanization (NCAM) Watershed. Journal of Science and Technology Research, 5 (3): 69-73.

#### More than Three Authors

**Ogunlela, A. O.; M. Y. Kasali; C. J. Ejieji and I. E. Ahaneku. (2006).** Hydrologic Characterization of the National Centre for Agricultural Mechanization (NCAM) Watershed. Journal of Science and Technology Research, 5 (3): 69-73.

### ***Conference Papers***

**Akorede, M. F. and Hizam, H. (2009).** Teaching power system analysis courses using MATPOWER. Paper presented at International Conference on Engineering Education (ICEED2009), Kuala Lumpur, Malaysia, 45-51, USA: IEEE.

### ***Reports, Thesis and Dissertation***

**Abioye, A. M. (2001).** Design of Engineering Power Transmission Elements using Visual Basic. Unpublished M.Eng. Thesis, Department of Electrical & Electronics Engineering, University of Ilorin, Ilorin, Nigeria.

### ***Web Publications***

**Anderson, T. (1996).** A Data Envelopment Analysis (DEA). Available online at: [www.emp.pdx.edu/dea/homedea.html](http://www.emp.pdx.edu/dea/homedea.html). Accessed on March 7, 2013.



**NOTES:**

1. All authors on the cited work must be listed. Use of “et al” in the list of references is not acceptable.
2. All citation details such as journal name, vol no, issue no, page nos for a journal source and conference city, and country for a conference paper, must be present.
3. Ensure you list the authors’ **surname** and not authors’ first name. This could be confirmed by searching the article’s title in Google scholar when in doubt.

**APPENDICES**

If there is only one appendix in the article, it should just read “Appendix”. However, if there are more than one appendix in the text, they should be identified as “Appendix A”, “Appendix B”, etc. Formulae and equations in appendices should be given separate numbering, such as Eq. (A.1), Eq. (A.2), etc, and Eq. (B.1), Eq. (B.2), etc, in a subsequent appendix, and so on. Similarly, for tables and figures: Table A.1; Fig. A.1, etc.

**Suggested Reviewers**

A list of, at least, three suggested reviewers should be provided with their current institutional affiliations as well as e-mail addresses on the title page. However, please note that the Managing Editor reserves the right to determine the appropriate reviewers to review your manuscript. This request is simply to populate our database of reviewers in diverse fields.

**Submission Checklist**

The following list will be useful during the final checking of your article prior to sending it to the journal for review. Please ensure that the following items are present:

- The title page contains **only**:
  - Manuscript title;
  - Authors’ names, affiliations, and contact details of the corresponding author;
  - The Abstract;
  - Five or six keywords; and
  - A list of three suggested reviewers and their e-mail addresses has been provided.
- Ensure that the anonymised manuscript **DOES NOT** contain the authors’ details and contacts such as names, postal address, e-mail address, and phone number.
- Further considerations
  - Manuscript has been 'spell-checked' and 'grammar-checked'
  - References are in the correct format for this journal
  - All references mentioned in the reference list are cited in the text, and vice versa

**Submission of Manuscript**

Submission of manuscript is on the condition that it is an original work of the author(s) and it has neither been published previously nor currently under consideration for publication elsewhere. Authors should submit the electronic copy of their manuscript directly to the journal through the journal's website using the online submission system. Please do not submit a hard copy to the

editorial office or send your manuscripts by e-mail. You may, however, report to the Editor any issues hindering you to make the online submission.

The online manuscript takes four stages to be successfully completed. In the first stage, you must check all the Submission Requirements checkboxes, and must agree to the copyright statement.

Clicking on the “Save and continue” button takes you to the “Upload Submission Files” page, where you must select an Article Component such as “Source texts” or “Article text” (any one will do). Next, you upload File 1, which is the file named **Manuscript** after which you click on the “Continue” button, next click on the Continue button again. At this point, click on “Add Another File”. On the displayed window, pick “This is not a revision of an existing file”, then select Article Component, which may also be “Source texts” or “Article text” (any one will do). Upload the file named **Title\_Page**, and continue, then click on the “Complete” button if you have no other document to upload again. Click on “Save and continue” to enter the article title and abstract. No need to enter the subtitle. To add other authors, click on the “Add contributor” button. Enter all the compulsory fields and save to add more authors or finish the submission process by clicking the “Finish Submission” button.

After the manuscript has been submitted, you will see a confirmation screen and receive an e-mail confirmation stating that your manuscript has been successfully submitted. If you do not receive this, your manuscript will not have been successfully submitted to the journal and the paper cannot progress to peer review. If this is the case your manuscript will still be sitting in the 'Incomplete' section of your 'Author Page' awaiting your attention to complete the process.

To track your submission's progress through the review and editorial process, you will need to log into the journal website, and choose your role as author. Click on the linked title to go to the submission record. There, you can see how many reviewers have completed their reviews out of a total assigned by the Editor. Authors should not panic when you see “A review is overdue”. That message is not for your consumption. You may wish to call the attention of the Editor if you do not get a feedback from us after three months of submission.

### **Open Access Agreement**

Upon acceptance of an article, authors will be requested to download from our homepage the open access agreement form, complete and sign it, and then upload it to the portal against that particular submission.

### **Article Publication Charge**

The Nigerian Journal of Technological Development (NJTD) is an open access journal. As a result, publishing of an article in the Journal requires an Article Publication Charge (APC), which will be billed following the acceptance of the article. Aside from this, the Journal does not impose any other charge on the author, be it submission charge or colour charge.

The APC will be charged based on the corresponding author's affiliation. For the corresponding author has dual affiliations, the affiliation of where the work was carried will be used. For the corresponding authors based in Nigeria, the APC of ₦60,000.00 (NGN) will be imposed while \$150.00 (USD) will be imposed on corresponding authors outside Nigeria. The publication fee is non-refundable once the article is published online. Payment can be made by International Bank wire transfer, Western Union Money Transfer, MoneyGram, Online money transfer.

Payment instructions will be sent to the corresponding author by the Managing Editor after the acceptance of the paper. The evidence of payment should be uploaded on the portal against the submission immediately after payment.

### **Subscription and Advertisement**

The subscription and advertisement rates can be obtained from the Editor-in-Chief, the Managing Editor or the Business Manager. Current and past volumes of the journal are available at Room **G11**, Department of Materials and Metallurgical Engineering, Faculty of Engineering and Technology, University of Ilorin, Ilorin; at Options Bookshop, Ibadan; or Jasper Books Nig. Ltd, Ilorin.

### **Complimentary Copies**

Since authors can always download their published papers from our website at [www.njtd.com.ng](http://www.njtd.com.ng), on our homepage at AJOL and in the Scopus database, we no longer send the author's complimentary copy to the authors. However, any author that so requires a print version of the journal shall pay a sum of Three Thousand Naira (N3,000:00) per copy exclusive of the delivery cost.

### **Queries**

For technical support on submissions, please send an e-mail to the Managing Editor via [njtd\\_man\\_editor@unilorin.edu.ng](mailto:njtd_man_editor@unilorin.edu.ng) or [editor@njtd.com.ng](mailto:editor@njtd.com.ng). For questions about the editorial process especially on the status of manuscripts under review, authors may write to request for this information only when a three-month period from submission has elapsed.

### **Peer Review Process**

NJTD operates a double anonymised peer review process. All submissions will be initially assessed by the Editor for suitability for the journal. Papers deemed technically suitable are then subjected to plagiarism check. If the similarity index is higher than 25%, such article is rejected at that stage and the corresponding author is communicated. Articles that pass this stage will be allocated to a Section Editor, who assigns a minimum of three reviewers to evaluate the scientific quality of the manuscript. However, the Editor is responsible for the final decision regarding acceptance or rejection of articles, and this decision is final.

Authors are encouraged to download the article processing flowchart from our homepage. The document summarises the peer review process used by NJTD. Authors should note that this process may last up to three months on the average.

## TABLE OF CONTENTS

Volume 21, Number 4, December 2024

S/No	Paper Title	Page Number
1	Optimizing Hybrid Renewable Energy Systems for Rural Electrification: A Case Study of Selected Villages in Kwara State, Nigeria. <b>Akinola Sunday Oladeji, Olubunmi Atilola</b>	1-12
2	Remediation of Contagious Metals from Mine-used Water using Carica Papaya Trunk Enhanced Charcoal produced with HCl acid <b>Adeyemi Adetoro, Samson O. OJoawo</b>	13-24
3	A Review of Artificial Intelligence Tools for the Management of Cleaning and Tracking in Photovoltaic Systems <b>Ayoub Boussiri, Youssef Ait el Kadi</b>	25-39
4	CFD based analysis of drag forces on twin submerged floating tubes <b>F. Forghanjaya, J. Akmal, A. Lubis, H. Harmen, M. Irsyad, M. B. Ramadhan</b>	40-47
5	Optimization Analysis of Dual-Mode Renewable Hybrid Power Systems: A Review <b>Bashiru Olalekan Ariyo, Mutalub Adesina Lambe, Olalekan Ogunbiyi, Musa AbdulWaheed, Monsurat Omolara Balogun, Bilkisu Ojuolape Jimada</b>	48-58
6	Defects Optimization of Green Part Ti-6Al-4V with Palm Stearin Binder using Response Surface Methodology <b>Juri Bin Saedon, Nor Hafiez Mohamad Nor, Syahar Shawal, A Arifin, M. A. Mifzal, S. Ahmad</b>	59-69
7	Green Polymer Composite Films for Sustainable Food Packaging: A Review <b>Aminu Hussaini, Abdulrasheed Abdulrahman, Yusuf Olabode Raji, Jibril Mohammed, Abubakar Salis, Aminu Mohammed</b>	70-84
8	Durability and Strength of Reinforced Concrete Bridges subjected to Corrosion: Fuzzy Random and Probabilistic Analysis <b>The Truyen Tran, Thu Minh Tran, Xuan Tung Nguyen, Van Thuat Nguyen, Ba Thanh Vu</b>	85-96

- 9 Automated Data Extraction and Character Recognition for Handwritten Test Scripts Using Image Processing and Convolutional Neural Networks 97-115  
**David Agbemuko, Imhade Okokpujie, Momoh J. E. Salami, Lagouge K. Tartibu**
- 10 Design and Fabrication of a Mechanical Sweeper 116-124  
**Kamaldeen O. AbdulRahman, Sukuru P. Oghenetega, Faith O. Ogunwoye, Shopeyin J. Olawale, Sayodun O. Abdulazeez, Suleiman A. Yahaya**
- 11 Partial Discharge-Based Ageing Assessment of High Voltage Crosslinked Polyethylene Cable 125-134  
**Sulaiman Haruna Sulaiman, Abubakar Abdulkarim, Abubakar Abdulkarim, Adamu Saidu Abubakar, Gaddafi Sani Shehu, Umar Musa, Abdullahi Abubakar Mas'ud**
- 12 PSO-Optimized Model Reference Adaptive PID Controller for Precise DC Motor Speed Control 135-144  
**John E. Oche, Hassan Abdullahi Bashir, Terkaa J. Shima**
- 13 Optimization of silver ion concentration into the matrix of zinc oxide nanoparticles synthesized via a hydrothermal approach 145-158  
**Imosobomeh Ikhioya**
- 14 Surface Properties and Characterisation of Cobalt-Nickel-Iron Alloy Coating on Mild Steel for Engineering Applications 159-167  
**Mohd Zakuan Zabri, Nik Rozlin Nik Mohd Masdek, Che Murad Mardziah, Noorlis Ahmad**
- 15 Waste-ram-fat as a Feedstock for Biodiesel Production using Heterogeneous Catalyst of Kaolinite-clay Impregnated Calcium-oxide from Chicken Eggshell 168-179  
**Olawale E. Ajala, Mary A. Ajala, Favour D. Afolabi, Jacob O. Ajala, Silas Opawoye, Dauda A. Ariyoosu**
- 16 Formulation of Film from a Quaternized Starch, Polyvinyl Alcohol and Tetraethylorthosilicate for Food Packaging 180-185  
**Norin Zamiah Kassim Shaari, Nurul Izzah Roslan**
- 17 A Testbed for Group Acknowledgement Circular Shift Communication Model in LoRa-based Wireless Sensor Networks 186-193  
**Abdulwakil Adekunle Kasali, Caleb Olufisoye Akanbi, Lawrence Omotosho, Ibrahim K. Ogundoyin**

- 18 Comparison of Hector SLAM and Gmapping for a Self-driving Mobile Robot on Slippery Surface 194-204  
**Norashikin M Thamrin, Muhammad Syafiq Ifwat Safizan, Khairul Anuar Juhari**
- 19 Physico-mechanical Properties of Ecofriendly Bricks using Recycled Polyethylene Terephthalate (PET) and Low-Density Polyethylene (LDPE) Wastes as Binders 205-212  
**Yusuf Olanrewaju Busari, Rachael omotoyosi Idowu, Abdallah Reghioua, kabir suleiman Ajao, Surajudeen Sikiru, Yusuf Lanre Shuaib-Babata, Issah Sadiq Ibrahim, Norlina Binti Mohd Abbas, James O. Adegbola, Taiwo Yahaya**
- 20 Exploring Benefits, Critical Success Factors and Barriers of Earned Value Management in Construction Projects: A Preliminary Evaluation 213-222  
**Chitti Babu Kapuganti, Balaji K.V.G.D., Sudhakar Mogili, Santhosh Kumar T.**