NIGERIAN JOURNAL OF ENGINEERING

SCIENCE AND TECHNOLOGY RESEARCH

Volume 11 Number 2, September 2025, ISSN 2315-9073

Faculty of Engineering

Modibbo Adama University

P.M.B. 2076, Yola, Adamawa State, Nigeria

The Editorial Board

Editor-in-Chief

Engr. Prof. M. E. Ibrahim

Deputy Editor-in-Chief

Engr. Dr. S. Y. Musa

Financial Secretary/Treasurer

Engr. Dr. (Mrs) Zainab U. Belel

Business/Production Manager

Engr. Prof. S. A. Kareem

Associate Editors

Engr. Prof. Ir. P. B. Onaji (Chemical Engineering)

Engr. Prof. J. A. Tanko (Civil Engineering)

Engr. Prof. Shehu Iya (Agricultural and Environmental Engineering)

Engr. Prof. A. Raji (Mechanical Engineering)

Engr. Prof. I. T. Thuku (Electrical and Electronics Engineering)

Editorial Secretary

Engr. Prof. B. A. Ankidawa

Editorial Office

c/o Dean's Office,

Faculty of Engineering,

Modibbo Adama University,

P. M. B. 2076, Yola,

Adamawa State, Nigeria.

TABLE OF CONTENTS

Title Page i

Editorial Board ii

Table of Contents iii

Assessment of Technical Losses in the Generation and 330KV Transmission Network of Nigeria's National Electric Power System 1
S.Y. Musa, P. Audu, V.M. IbrahimA.B. Ba'ams, G.B. Dubukumah, A. Abdullahi and K.B. Zi

Machine Learning-Based Prediction of External Corrosion Rates in Buried Unprotected Gas Pipelines 11
A.M. Waziri, T.N. Guma, J.O. Akindapo and D.U. Orueri

Status Review on Pipeline Leaks Detection and Localization Systems Using Wireless Sensor Network 24
J.S. Soja, I.T. Thuku, V.M. Ibrahim and M.K. Luka

Evaluation of Palm Fruit Stripping Machine Developed 31
S.S. Moses, M.S. Abolarin, K.T. Obanimomo, J.Y. Jiya and H.I. Morkah

A Study on the Performance of a Polyvinyl Chloride (PVC) Passive Solar Dryer for Perishable Crops 39
Y.I. Tashiwa, E.K. Bwade, J.U. Tumba and H.U. Kabri

Mechanical and Morphological Characterization of Banana Fiber-Reinforced Natural Rubber Composites for Combat-Grade Tyre Applications 47
A.I. Felix, A.J. Olaitan and D.U. Orueri

Investigation of Partial Replacement of Cement with Neem Leaf Ash in Concrete 56
I.O. Sholadoye, B.E. Achara and A. Adeyinka

The Investigation of the Need for Development of Bus Rapid Transit for Abuja, Nigeria 63
K.D. Adeosun, F.B. Tunde, A.U. Nakazelle, B.E. Achara, O.I. Nurudeen and A.O. Mohammed

Development of a Permanent Mould for Casting Aluminum Piston Used in Sumec Firman 2.5KVA Generator 75
P. OdehM.S. Abolarin, S. Lawal, O. Adedipe, H.I. Orkah and J.Y. Jiya

Development and Performance Evaluation of a Hybrid Egg Incubator 88
A.A. Abdullahi, J.Y. Jiya, O.A. Olugboji, O. Adedipe, M.S. Abolarin, E.Z. Jiya and M.O.O. yebamiji

Production and Characterization of Bioethanol from Sugarcane Molasses 94
A.A. Bukar, Y.J. Soja, A.M. Yami and A.M. Usman

Subsurface Water Quality from Sand Point of Irrigation and Livestock-A Case Study of Oyo North Agricultural Department Project South West Nigeria 108
A.H. Faruk, G.S. Malgwi and A.Y. Songodoyin

Optical Sensor-Based Ball Tracking and Centralization Using a PID-Controlled Stewart Platform 118
C.C. Nwaobasi and A. Jival