



**UNIVERSITY OF ILORIN**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**

**1<sup>st</sup> FACULTY OF ENGINEERING  
AND TECHNOLOGY**  
*International Conference*  
**(FETiCON 2023)**

**BOOK OF ABSTRACTS**


**THEME:**

**ADVANCES AND TECHNOLOGICAL INNOVATIONS  
IN NATION BUILDING AND ATTAINMENT OF  
SUSTAINABLE DEVELOPMENT GOALS**

**SIDE ATTRACTION: TECHNOLOGY EXHIBITION**



 5th-7th June, 2023

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**Table of Contents**

PAPER 13 - APPLICATION OF SMOOTHING TECHNIQUES IN STREAM FLOW PREDICTION OF SEMI-ARID REGION: A CASE OF HADEJIA RIVER, NIGERIA.	11
PAPER 14 - A SPACE VECTOR PULSE WIDTH MODULATED THREE PHASE INVERTER FOR AN IMPROVED SOLID-STATE TRANSFORMER DESIGN	11
PAPER 15 - REVIEW OF GEOTHERMAL ELECTRICITY GENERATION AND ITS ENVIRONMENTAL IMPACTS IN NIGERIA	12
PAPER 17 - MODELLING INTERNET OF THINGS ARCHITECTURE FOR ACCIDENT DETECTION AND REPORTING FOR EMERGENCY MEDICAL ASSISTANCE	12
PAPER 18 - INFLUENCE OF STATOR SLOT NUMBER ON THE PERFORMANCE OF AN ELECTRICAL MACHINE	13
PAPER 19 - EVALUATION OF THE THERMAL ENVIRONMENTS OF TWO SINGLE-SPAN TRIPLE-LAYERED GREENHOUSES EQUIPPED WITH CIRCULAR AND HORIZONTAL AIRFLOW FANS	13
PAPER 21 - HIGH-PERFORMANCE CONCRETE INCORPORATING ALMOND LEAVE ASH AS SUPPLEMENTARY CEMENTING MATERIAL	14
PAPER 23 - MODIFICATION OF SOME QUALITY ATTRIBUTES OF BROWN RICE-BAMBARA NUTS-PINEAPPLE PEELS EXTRUDED SNACKS THROUGH EXTRUSION CONDITIONS	14
PAPER 24 - APPLICATION OF MODIFIED HOLLOW PVDF-MEMBRANE SYSTEM FOR REMEDIATING PALM OIL MILL EFFLUENT	15
PAPER 25 - LEACHATE AS A POWERFUL PRECURSOR FOR HYDROGEN SYNTHESIS: PROCESS OPTIMIZATION	15
PAPER 26 - PHYTOREMEDIATION OF LEAD-POLLUTED DUMPSITE SOILS USING A NOVEL HYPER-ACCUMULANT IN COMBINATION WITH A BIODEGRADABLE CHELATING AGENT	16
PAPER 27 - COMPARATIVE STUDY OF BIOLOGICAL DEGRADATION OF CRYSTAL VIOLET BY MICROBIAL MIXED CULTURES FROM COW DUNG AND SOIL	16
PAPER 28 - MATHEMATICAL MODEL FOR THE PREDICTION OF THE TRANSPORT AND FATE OF OIL SPILL	17
PAPER 29 - ACHIEVING QUALITY OF EXPERIENCE IN TELECOMMUNICATION SERVICE	17
PAPER 31 - DEVELOPMENT OF TWO-LEVEL CONTROL TECHNIQUES FOR LOAD FREQUENCY CONTROL IN ISLANDED TWO-AREA MULTISOURCE MICROGRID	18
PAPER 32 - DEVELOPMENT OF HYBRID SCHEME TO IMPROVE TRANSIENT STABILITY AND FAULT RIDE-THROUGH CAPABILITY OF DOUBLY FED INDUCTION GENERATOR-BASED WIND TURBINE SYSTEM UNDER FAULT CONDITIONS	18

**Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria**

PAPER 33 - EFFECTS OF PROCESS PARAMETERS ON OIL AND BIODIESEL YIELD FROM SANDBOX ( <i>HURA CREPITANS</i> ) SEED	19
PAPER 34 - ASSESSING THE FEASIBILITY OF EXPLOITING HYDROPOWER RESOURCES OF UNDERUTILIZED WATER DAM	19
PAPER 35 – IMPACT OF THERMO-FLUID MODELING AND SIMULATION FOR A TWO-SPOOL TURBOSHAFT GAS TURBINE CONFIGURATION	20
PAPER 36 - FLOOD FREQUENCY ANALYSIS OF RIVER NIGER AT LOKOJA GAUGE STATION: A MORPHODYNAMIC APPROACH	20
PAPER 37 - ASSESSMENTS OF METAL PARTICLES IN GROUND FOOD	21
PAPER 38 - A SURVEY OF POWER AMPLIFIER SIGNAL LINEARIZATION TECHNIQUES IN COMMUNICATION NETWORKS	21
PAPER 40 - SEASONAL VARIATION AND HEALTH RISK ASSESSMENT OF GASEOUS AND PARTICULATE POLLUTANTS AROUND TRAFFIC HOTSPOTS OF A DENSELY POPULATED AFRICAN CITY	22
PAPER 43 - UNCONFINED COMPRESSIVE STRENGTH OF <i>BACILLUS SPHAERICUS</i> INDUCED PRECIPITATE TREATED LATERITIC SOIL	22
PAPER 45 - TECHNO-ECONOMIC MODELLING OF BIOCLARIFIED WATER RECOVERY FROM PETROLEUM WASTEWATER USING ASPEN SOFTWARE AND BOX-BEHNKEN DESIGN	23
PAPER 46 - NEED FOR EFFECTIVE EVALUATION OF WATER RESOURCES QUALITIES FOR SUSTENANCE AND ATTAINMENT OF CONSTRUCTION (ENGINEERING) DEVELOPMENT GOALS	23
PAPER 49 - A SURVEY OF LOAD BALANCING SCHEMES FOR HETEROGENEOUS NETWORKS	24
PAPER 50 - EFFECT OF CURING AND TREATMENT METHOD ON ULTRASONIC PULSE VELOCITY OF COMPACTED LATERITIC SOIL TREATED WITH <i>BACILLUS THURINGIENSIS</i>	24
PAPER 51 - DEVELOPMENT OF SUSTAINABLE CONCRETING USING RHA BLENDED BIO SELF-COMPACTING CONCRETE INCORPORATING <i>BACILLUS SUBTILLIS</i> AND DIFFERENT FILLERS	25
PAPER 52 - CHARACTERIZATIONS OF SHEA BUTTER LEAF ( <i>VITTELLA PARADOXA</i> ) POWDER	25
PAPER 53 - OPTIMIZING GEOPOLYMERIZATION PROCESS OF METABENTONITE-METAKAOLIN BASED GEOPOLYMER CONCRETE USING RESPONSE SURFACE METHOD	26
PAPER 54 - A REVIEW ON EXTENDING NETWORK LIFETIME OF WIRELESS RECHARGEABLE SENSOR NETWORKS: CURRENT TRENDS AND FUTURE PERSPECTIVES	26
PAPER 57 - ANALYSIS AND SIMULATION OF A ROTOR FLUX-ORIENTED CONTROL SCHEME FOR A THREE PHASE INDUCTION MOTOR AT VARIABLE SPEED	27

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 58 - MITIGATING DUST IMPACT: A COMPREHENSIVE OVERVIEW OF SOLAR PANEL CLEANING DEVICES FOR MAXIMIZED PERFORMANCE	27
PAPER 59 - REVIEW ON MOBILE RADIO PROPAGATION	28
PAPER 60 - EXPERIMENTAL PROCESS OPTIMIZATION AND GC-MS CHARACTERIZATION OF BIOACTIVE ANTIOXIDANT EXTRACT PRODUCTION FROM HYPOTIS SUAVEOLENS LEAVES	28
PAPER 61 - MITIGATING INTERFERENCE AND IMPROVING RESOURCE USAGE IN A DOWNLINK MU-MIMO TRANSMISSION FOR 5G NETWORKS	29
PAPER 62 - DESCRIPTIVE ANALYSIS OF NASA WEATHER DATA USING MACHINE LEARNING ALGORITHM	29
PAPER 65 - AN OVERVIEW OF APPLICATIONS OF COGNITIVE WIRELESS COMMUNICATION SIMULATORS	30
PAPER 66 - CHARACTERIZATION OF ALUMINIUM-MATRIX COMPOSITE WITH ACID-TREATED CARBONIZED COCONUT HUSK REINFORCEMENT	30
PAPER 67 - EXPERIMENTAL STUDY OF THE PRESSURE DROP AND FLOODING IN A ROTATING PACKED BED	31
PAPER 68 - DEVELOPMENT OF ACTIVATED CARBONS FROM PENTACLETHRA MACROPHYLLA PODS AS HIGH-PERFORMANCE ADSORBENT FOR TREATMENT OF AZO DYE WASTEWATER	31
PAPER 69 - OPTIMIZING DEEP LEARNING FOR MEDICAL IMAGE CLASSIFICATION: A COMPARISON OF GRADIENT-BASED METHODS	32
PAPER 70 - H-INFINITY MIXED SENSITIVITY FUNCTION FOR THE DC MOTOR CONTROL	32
PAPER 71 – ADVANCEMENTS IN COMPOSITE BRAKE PAD MATERIALS: A REVIEW OF THEIR TRIBOLOGICAL PROPERTIES AND PERFORMANCE	33
PAPER 72 – EXPLORATION OF GLOBAL RENEWABLE ENERGY STATISTICS FOR ELECTRICITY GENERATION: A CASE STUDY OF NIGERIA	33
PAPER 73 – COMMUNITY PARTICIPATION AND SUSTAINABLE OF WATER AND SANITATION SERVICES IN MUSANZE DISTRICT, NORTHERN PROVINCE OF RWANDA	34
PAPER 74 – ACCURATE PREDICTION OF QUADCOPTER DYNAMICS THROUGH INCREMENTAL EVOLUTION OF GRNN MODEL DEVELOPMENT	34
PAPER 76 – IMPACT OF SUPPORT GEOMETRY ON THE PUNCHING SHEAR BEHAVIOUR OF FLATS SLABS	35
PAPER 77 – RECONFIGURATION OF UNBALANCED DISTRIBUTION NETWORK FOR IMPROVED VOLTAGE PROFILE AND POWER LOSS MITIGATION	35
PAPER 83 – A REVIEW OF THE EFFECT OF EGGSHHELL POWDER ON THE PROPERTIES OF RECYCLED POLYMERS	36

**Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria**

PAPER 84 – SMART FARMING FOR SUSTAINABLE RICE PRODUCTION IN NIGERIA	36
PAPER 85 – DEVELOPMENT OF AN IMPROVED FIBRE BRAGG GRATING SENSOR SENSITIVITY MODEL WITH TEMPERATURE COMPENSATION FOR STRUCTURAL HEALTH MONITORING	37
PAPER 86 – DEVELOPMENT OF AN AUTOMATED PLATE NUMBER RECOGNITION AND IDENTIFICATION SYSTEM	37
PAPER 87 – DEVELOPMENT OF FULLY BIOBASED MATERIALS FOR MEMBRANE INDUSTRY TRANSFORMATIONS IN THE LIGHT OF CIRCULAR ECONOMY	38
PAPER 88 – EFFECTS OF SURFACE LININGS AND THICKNESS OF LINING ON THE MICROBIAL LOAD OF STORED ONION BULBS ( <i>ALLIUM CEPA L.</i> )	38
PAPER 89 – STRUCTURAL INTEGRITY ASSESSMENT OF THE ACADEMIC AND HOSTEL BUILDINGS AT UNIVERSITY OF ILORIN USING NON-DESTRUCTIVE METHODS	39
PAPER 90 – OPTIMIZATION OF CHARCOAL BRIQUETTES PRODUCTION PROCESS FROM RAFFIA PALM ( <i>RAPHIA HOOKERI</i> ) EPICARP USING RESPONSE SURFACE METHODOLOGY	39
PAPER 91 – PHYSICAL AND MECHANICAL PROPERTIES OF CONCRETE PRODUCED WITH PERIWINKLE SHELL ASH AND QUARRY DUST	40
PAPER 92 – A HOLISTIC APPROACH TOWARDS MODELLING, SYNTHESIS AND FABRICATION OF ORGANO-INORGANIC PEROVSKITE SOLAR CELL MODULE	40
PAPER 94 – SYNTHESIS AND CHARACTERIZATION OF CNTS/TIO <sub>2</sub> NANOCOMPOSITE FOR FORMULATION OF HYBRID NANOFLUID FOR MACHINING CFRPS	41
PAPER 95 – AN INTERNET OF THINGS (IOT) BASED PRECISION SYSTEM FOR IMPROVED IRISH POTATO PRODUCTION IN NIGERIA	41
PAPER 102 – MATERIAL SUSTAINABILITY IN NIGERIAN CONSTRUCTION ORGANIZATIONS: A PATHWAY TO ECONOMIC SUSTAINABILITY	42
PAPER 103 – MODELLING OF VOCS EMISSION AND TRANSPORT IN INDOOR ENVIRONMENT USING FINITE ELEMENT ANALYSIS	42
PAPER 104 – VALUE-ADDED SESAME ( <i>SESAMUM INDICUM</i> ) SEED CANDY QUALITY PREDICTION	43
PAPER 105 – ADSORPTION OF PHENOLS FROM TANNERY WASTEWATER USING MANGANESE DIOXIDE-ALBIZIA LEBBECK COMPOSITE	43
PAPER 106 – INFLUENCE OF STORAGE DURATION AND PACKAGING MATERIAL ON THE QUALITY OF VALUE-ADDED SESAME ( <i>SESAMUM INDICUM</i> ) SEED CANDY	44
PAPER 107 – ENERGY ANALYSES OF BRIQUETTES PRODUCED FROM TORREFIED LOCALLY SOURCED GROUNDNUT SHELL	44

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 108 – IMPACT OF FISH FARMING ON THE WATER QUALITY OF RIVER CHANCHAGA, MINNA	45
PAPER 110 – DESIGN AND SIMULATION OF HYBRID POWER SUPPLY FOR RESIDENTIAL CONSUMER	45
PAPER 111 – DESIGN OF A LEUKEMIA DETECTION SYSTEM USING DIGITAL BLOOD SMEAR IMAGES	46
PAPER 112 – SUSTAINABLE SOLID WASTE MANAGEMENT AT GREGORY UNIVERSITY UTURU	46
PAPER 113 – SOLID WASTE MANAGEMENT IN A NIGERIAN UNIVERSITY HOSTELS	47
PAPER 114 – DISTURBANCE OBSERVER FOR HARMONIC SUPPRESSION OF A Z-SOURCE INVERTER FED THREE-PHASE INDUCTION MOTOR DRIVE	47
PAPER 115 – THE DESIGN OF ENGINE WITH REDUCED EMITTED POLLUTANTS ON THE ENVIRONMENT	48
PAPER 116 – PROBABILISTIC MODELLING OF FLOOD FLOW ALONG MGENI RIVER AT TABLE MOUNTAIN, SOUTH AFRICA	48
PAPER 117 – AFFORDABLE HOUSING USING INDIGENOUS BUILDING MATERIALS	49
PAPER 118 – HYDROGEN ECONOMY: PANACEA TO AIR POLLUTION PROBLEMS AND PROSPECTS FOR A CLEANER PLANET EARTH	49
PAPER 119 – MAXIMUM POWER TRACKING OF PHOTOVOLTAIC UNDER PARTIAL SHADING WITH SPRING SEARCH ALGORITHM INTEGRATED WITH PERTURB AND OBSERVE	50
PAPER 120 – SHORT-TERM LOAD FORECASTING FOR MICROGRID SYSTEM BASED ON ARTIFICIAL INTELLIGENCE TECHNIQUES	50
PAPER 122 – EXTRACTION AND CHARACTERIZATION OF KERATIN PROTEIN FROM CHICKEN FEATHERS USING ALKALINE HYDROLYSIS METHOD: EFFECTS OF SODIUM SULPHIDE CONCENTRATION AND SHELF-LIFE EVALUATION	51
PAPER 123 – DEVELOPMENT OF A KERATIN-BASED HAIR CREAM FORMULATION FOR REPLENISHING DAMAGED HAIR: A RESPONSE SURFACE METHODOLOGY APPROACH	51
PAPER 124 – OPTIMAL SITING AND SIZING OF D-STATCOM FOR POWER LOSS REDUCTION IN DISTRIBUTION NETWORKS USING BACTERIAL FORAGING ALGORITHM	52
PAPER 125 – ANALYSING GENE EXPRESSION DATA OF PATIENTS WITH AND WITHOUT OVARIAN CANCER USING DYNAMIC MODE DECOMPOSITION	52
PAPER 126 – PRODUCTION OF BIOGAS FROM ANAEROBIC CO-DIGESTION OF PINEAPPLE CROWN AND CATTLE DUNG IN A BATCH DIGESTER	53

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 129 – MATHEMATICAL MODELLING OF WELDING PARAMETERS AND THEIR EFFECTS ON ENERGY CONSUMPTION IN WELDED CR-MO METAL	53
PAPER 134 – EXPERIMENTAL EVALUATION AND OPTIMIZATION OF ORGANIC MATERIALS FOR THE DEVELOPMENT OF FREE-ASBESTOS BRAKE PADS	54
PAPER 135 – A BRIEF REVIEW OF WATER PUMPS CATEGORY AND THEIR POWER SOURCES	54
PAPER 136 – CHARACTERIZATION OF PIT SAND OBTAINED FROM SELECTED LOCATIONS IN THE SOUTH WESTERN ZONE OF NIGERIA	55
PAPER 137 – COMPUTATIONAL DEVELOPMENT AND AERODYNAMIC ANALYSIS OF A SINGLE-STAGE LAUNCH VEHICLE TO SUBDUE POST-LAUNCH RISK	55
PAPER 141 – COMMUNICATION RANGE ASSESSMENT OF LORA-BASED IOT SENSOR NODE FOR SMART CITY APPLICATIONS	56
PAPER 142 – SYNTHESIS AND CHARACTERIZATION OF ZEOLITE A FROM ALOJI KAOLIN VIA HYDROTHERMAL METHOD	56
PAPER 143 – PARAMETERS CHARACTERIZATION OF WIRELESS TECHNOLOGIES: AN INDOOR LOCALIZATION PERSPECTIVE	57
PAPER 144 – ASSESSMENT OF THE SIGNIFICANCE OF GIS-BASED WATERSHED ANALYSIS FOR EFFECTIVE WATER RESOURCES MANAGEMENT	57
PAPER 147 – STORAGE STABILITY OF OPTIMIZED FOAM-MAT DRIED TOMATO-PEPPER-ONION POWDER UNDER DIFFERENT PACKAGING CONDITIONS	58
PAPER 148 – EXPERT SYSTEM FOR TROUBLESHOOTING AND REPAIR OF COMPUTER ENGINEERING LABORATORY EQUIPMENT	58
PAPER 149 – TEMPERATURE AND RELATIVE HUMIDITY DISTRIBUTION ANALYSIS OF A POULTRY IN SUBTROPICAL AREA OF NIGERIA	59
PAPER 152 – A REVIEW OF WATER ABSORPTION IN WATER HYACINTH REINFORCED HIGH DENSITY POLYPROPYLENE (HDPP) COMPOSITE	59
PAPER 154 – THE IMPLICATIONS OF LOW SHORT-CIRCUIT CAPACITY ON THE STRENGTH OF POWER GRID: A NIGERIAN CASE STUDY	60
PAPER 155 – BAMBOO AVAILABILITY AND LAND USE PATTERN IN THE SURROUNDING SIX LOCAL GOVERNMENT AREAS TO IBADAN LAND METROPOLIS, NIGERIA	60
PAPER 156 – PREDICTION OF NOX EMISSION IN GAS TURBINE POWER PLANT WITH HARRIS HAWKS OPTIMIZED ARTIFICIAL NEURAL NETWORK	61

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 157 – EFFECT OF ROASTING TIME ON THE PROXIMATE AND ANTI-NUTRITIONAL COMPOSITIONS OF DELONIX REGIA SEED FLOUR	61
PAPER 158 – INFLUENCE OF WATERSHED DELINEATION ON HYDROLOGICAL PROCESSES UPSTREAM WATERSHED OF ASA DAM RIVER, ILORIN, KWARA STATE, NIGERIA	62
PAPER 159 – EFFECT OF CALCINATION PARAMETERS ON CHEMICAL COMPOSITION OF BEANS POD ASH FOR POZZOLANIC ACTIVITY	62
PAPER 161 – STATISTICAL OPTIMIZATION OF THE SYNTHESIS OF CALCIUM OXIDE FROM DOLOMITE FOR CARBON DIOXIDE CAPTURE	63
PAPER 162 – EFFECT OF RESAMPLED DIGITAL ELEVATION MODEL (DEM) ON FLOW AND SEDIMENT LOADING PREDICTION UPSTREAM OF OYUN RIVER CATCHMENT IN KWARA STATE	63
PAPER 163 – GREY-BASED TAGUCHI ANALYSIS FOR TRIPLE OBJECTIVE OPTIMIZATION OF TIG WELDED LOW CARBON STEEL	64
PAPER 164 – GREY-BASED TAGUCHI ANALYSIS FOR TRIPLE OBJECTIVE OPTIMIZATION OF TIG WELDED LOW CARBON STEEL	64
PAPER 165 – SUSTAINABLE MANAGEMENT OF STORM WATER GENERATION IN A FAST-URBANIZING RESIDENTIAL AREA OF MALETE, KWARA STATE, NIGERIA	65
PAPER 167 – ASSESSMENT OF AUTOMOBILE USERS' PERCEPTION OF VIABILITY OF PRODUCING SPARE PARTS FROM BIOMATERIAL COMPOSITES IN NIGERIA	65
PAPER 169 – DEVELOPMENT OF ULTRA-HIGH-PERFORMANCE CONCRETE (UHPC) USING LOCALLY AVAILABLE MATERIALS: A REVIEW	66
PAPER 170 – PLANT DISEASE DETECTION USING CNN WITH SPATIAL ATTENTION	66
PAPER 172 – SELECTION AND PORE DISTRIBUTION ANALYSIS OF BIOCOMPOSITE IMPLANTS FOR LOAD-BEARING BONE REPLACEMENT	67
PAPER 173 – BUILDING OF MACHINE LEARNING PREDICTIVE MODEL FOR SIMULATING BIODIESEL YIELD	67
PAPER 174 – EXPERIMENTAL DETERMINATION OF COMMINUTION PARAMETERS OF ZANKAN SPODUMENE	68
<i>ABSTRACT</i>	68
PAPER 175 – RESEARCH FINDINGS IN GEOTECHNICAL PRACTICES FOR CONSIDERATION IN ROCK FORMATION	68
PAPER 176 – DEVELOPMENT AND CHARACTERIZATION OF SAWDUST/PROSOPIS AFRICANA LEAF SILVER-ZINC NANOPOROUS ADSORBENT	69



***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 177 – DEVELOPMENT AND CHARACTERIZATION OF NANOPOROUS ADSORBENT FROM AGRICULTURAL WASTE	69
PAPER 178 – DEVELOPMENT OF A SMART TRAFFIC CONTROL MODEL USING DEEP LEARNING TECHNIQUE	70
PAPER 179 – ANALYSIS OF LOCALLY PRODUCED ALUMINIUM OXIDE FOR THE PRODUCTION OF WASTEWATER TREATMENT FILTER USING XRF, SEM/EDX	70
PAPER 180 – IMPACT ASSESSMENT OF A SOLID WASTE DUMP SITE ON ITS HOST ENVIRONMENT: PARTICULATE MATTER	71
PAPER 183 – EFFECT OF CARBURIZATION TIME AND TEMPERATURE ON HARDNESS PROPERTIES OF MILD STEEL	71
PAPER 185 – GREEN HYDROGEN PRODUCTION FROM PHOTOVOLTAIC POWER STATION AS A ROAD MAP TO CLIMATE CHANGE MITIGATION	72
PAPER 187 – CORROSION SUSCEPTIBILITY OF FOOD GRINDING DISCS IN GASTRO-INTESTINAL ENVIRONMENT	72
PAPER 190 – CORRELATION BETWEEN PRODUCTION METHODS AND TRIBOLOGICAL DEGRADATION OF FOOD GRINDING DISCS	73
PAPER 191 – EFFECTS OF PROCESSING ROUTES ON THE PHYSICOCHEMICAL PROPERTIES OF RECYCLED CARBONATED CAN	73
PAPER 192 – DEVELOPMENT OF AN ARTIFICIAL INTELLIGENCE BASED SYSTEM FOR NUTRIENT DELIVERY TO GREENHOUSE GROWN CROPS	74
PAPER 193 – LEARNING FROM EXAMPLES PARADIGM FOR THE DESIGN OF FUZZY CONTROL FOR A REACTIVE DISTILLATION PROCESS	74
PAPER 194 – REMEDIATION OF SPENT ENGINE OIL-CONTAMINATED SOIL BY THE USE OF BIOMATERIALS	75
PAPER 195 – EFFECTS OF IRON ORE TAILINGS (IOT) ON THE MECHANICAL PROPERTIES OF CONCRETE	75
PAPER 196 – OVERVIEW STORAGE TECHNIQUES AND QUALITY EVALUATION OF FRUITS AND VEGETABLES FOR MINIMA POSTHARVEST LOSSES	76
PAPER 197 – TECHNO-ECONOMIC ANALYSIS OF WIND ELECTRIC ENERGY GENERATION IN BENIN CITY	76
PAPER 198 – DEVELOPMENT AND PERFORMANCE EVALUATION OF A FACULTATIVE STABILISATION POND FOR FISH WASTEWATER TREATMENT	77
PAPER 199 – ANALYSIS OF FIVE-PHASE SYNCHRONOUS RELUCTANCE MOTOR UNDER MULTI-PHASE FAULTS	77

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 201 – REACTION KINETICS OF CORNCOB HYDROLYSIS OF A MAGNETIC SULFONATED SOLID ACID CATALYST	78
PAPER 204 – EFFECT OF SALINITY ON THE GROWTH PARAMETERS OF OKRA PLANT IN TUNGAN KAWO IRRIGATION SCHEME	78
PAPER 206 – DEVELOPMENT OF BIO-NANOCOMPOSITE FILMS FROM SWEET POTATO FOR ACTIVE FOOD PACKAGING	79
PAPER 207 – INFLUENCE OF LAND LEVELLING AND TILLAGE OPERATIONS ON SOME SOIL PHYSICAL PROPERTY OF SANDY LOAM SOIL	79
PAPER 208 – INFLUENCE OF CARBONIZED PLANTAIN PEEL ADDITION ON THE PROPERTIES OF ALUMINIUM MATRIX COMPOSITE	80
PAPER 209 – APPLICATION OF SUPPORT VECTOR REGRESSION MODELLING FOR THE PREDICTION OF IMPACT ATTENUATION OF 3D PRINTED HIP PROTECTORS	80
PAPER 210 – INFLUENCE OF CARBONIZED COCONUT HUSK ADDITION ON THE PROPERTIES OF ALUMINIUM MATRIX COMPOSITE	81
PAPER 211 – CFD ANALYSIS OF A 3-BLADED NACA 0018 VERTICAL AXIS WIND TURBINE FOR DEPLOYMENT IN ILORIN, KWARA STATE, NIGERIA	81
PAPER 212 – DEVELOPMENT OF AN APPLICATION SOFTWARE FOR DESIGN OF OFF-GRID PHOTOVOLTAIC ENERGY SYSTEMS	82
PAPER 213 – DEVELOPMENT AND PERFORMANCE EVALUATION OF A SCREW PRESS BRIQUETTING MACHINE	82
PAPER 214 – CONSOLIDATION CHARACTERISTICS OF ROAD SOILS AT DIFFERENT COMPACTION ENERGIES AND MOISTURE	83
PAPER 215 – DEVELOPMENT OF A FUZZY LOGIC BASED OFFLINE HANDWRITTEN CHARACTER RECOGNITION SYSTEM	83
PAPER 216 – DEVELOPMENT OF HARMONIC PERIOD-BASED TASK SET SCALING MECHANISM FOR REAL TIME TASK SCHEDULING ALGORITHM BASED ON THE RBOUND UTILIZATION BOUND APPROACH	84
PAPER 217 – OCCUPATIONAL SAFETY PRACTICES AND ATTAINMENT OF SUSTAINABLE DEVELOPMENT GOALS AMONG TRICYCLE RIDERS IN MINNA	84
PAPER 218 – ENHANCING FOOD SAFETY AND QUALITY WITH EDIBLE COATINGS: A REVIEW	85
PAPER 219 – EFFECT OF PROCESS VARIABLES ON THE SYNTHESIS OF ZEOLITE A FROM ALOJI KAOLIN	85
PAPER 220 – OPTIMIZATION OF SOME SELECTED PROPERTIES FOR BIOPLASTIC PRODUCTION FROM WASTE CASSAVA AND POTATO PEELS	86

***Book of Abstracts, 1<sup>st</sup> Faculty of Engineering and Technology Conference (FETiCON 2023),  
Jun. 5 - 7, 2023, University of Ilorin, Nigeria***

PAPER 221 – BIODIESEL PRODUCTION FROM WASTE COOKING OIL: THE INFLUENCE OF HIERARCHICAL AND CONVENTIONAL BETA ZEOLITE ON YIELD AND QUALITIES	86
PAPER 222 – SYNTHESIS AND CHARACTERIZATION OF HIERARCHICAL BETA ZEOLITE CATALYST FROM AHOKO KAOLIN	87
PAPER 224 – HIGH-CAPACITY DATA-HIDING USING RLE COMPRESSION AND LSB STEGANOGRAPHY ALGORITHM	87
PAPER 225 – CHEMICAL MODIFICATION OF LOCUST BEAN POD HUSK FIBRE AS A REINFORCING COMPONENT FOR POLYMER COMPOSITE APPLICATION	88
PAPER 226 – STUDY OF THE PYROLYTIC CONVERSION OF PALM KERNEL SHELLS BIOMASS TO FUEL	88
PAPER 227 – PERFORMANCE EVALUATION OF FURFURAL PRODUCTION FROM RICE STRAW USING DIFFERENT SOLVENTS AS PROMOTERS	89
PAPER 228 – SPATIAL AND TEMPORAL ANALYSIS OF RAINFALL AND MEAN TEMPERATURE PATTERN UNDER CLIMATE CHANGE IN NIGERIA	89
PAPER 229 – MODIFICATION OF UREA FORMALDEHYDE WITH NANOCELLULOSE DERIVED FROM BAOBAB POD FIBRE AND WASTE NOSE MASK	90
PAPER 230 – EFFECT OF DIFFERENT MULCHING MATERIALS ON GROWTH PARAMETERS AND YIELD OF OKRA (ABELMOSCHUS ESCULENTUS) PRODUCTION IN MINNA, NIGERIA	90
PAPER 231 – EXPLORING THE EFFECTS OF HEAT TREATMENTS ON Ti6Al4V: A REVIEW	91
PAPER 232 – PERFORMANCE EVALUATION OF DEVELOPED ENGINE POWERED TIGERNUT HARVESTING MACHINE	91
PAPER 233 – QUALITY ENHANCEMENT OF STIFF DOUGH (TUWO): A REVIEW	92

**Paper 136 – Characterization of Pit Sand Obtained from Selected Locations in The  
South Western Zone of Nigeria**

S. S. Omopariola<sup>1\*</sup> and A. A. Jimoh

<sup>1</sup>Civil Engineering Department, Federal Polytechnic, Ilaro,

<sup>2</sup>Civil Engineering Department, University of Ilorin, Ilorin

\*Email: samuel.omopariola@federalpolyilaro.edu.ng

**ABSTRACT**

Sand is about the commonest fine aggregate available in South Western Nigeria. Of the various types of natural sand, pit sand is the most readily available and most widely used. However, not all available Pit – sand is fit for concreting works. This study focusses on the characterization of Pit sand obtained from selected locations across the South Western zone of the Country. From the values obtained the conformity with relevant standards and the suitability for concreting works was determined. Samples of Pit – sand were collected from three different locations from each of the five states in the zone. Sieve analysis test were carried out on all the samples and the values of fineness modulus (FM), coefficient of uniformity (Cu) and coefficient of curvature (Cc) were determined. Other properties considered are specific gravity (SG), water absorption (WA), and percentage silt content (SC). These values were compared with values stipulated in British standards and other relevant literatures. The range of the values of FM, Cu and Cc SG, WA, and SC are 4.16 – 4.68, 2.63 – 10, and 0.53 – 2.56 2.67 – 2.86, 0.67 – 2.04 and 5.4 – 18.18 respectively. Conclusively, while some of the samples are suitable, some are not.

**KEYWORDS:** Characterization, Pit – Sand, Selected, Locations

**Paper 137 – Computational Development and Aerodynamic Analysis of a Single-Stage  
Launch Vehicle to Subdue Post-Launch Risk**

A. Jinadu<sup>1\*</sup>, A. M. Oluwatofunmi<sup>1</sup>, O. A. Olayemi<sup>1</sup>, T. Dmytro<sup>2</sup>, V. Koloskov<sup>3</sup>

<sup>1</sup>Department of Aeronautical and Astronautical Engineering, Faculty of Engineering, Kwara State University,  
Kwara State, Nigeria.

<sup>2</sup>Nanjing University of Aeronautics and Astronautics, Nanjing, China.

<sup>3</sup>National University of Civil Defence of Ukraine, Ukraine.

\*Email: abdulbaqi.jinadu@kwasu.edu.ng

**ABSTRACT**

The aerospace industry has prioritized reducing fatalities and failure rates after the launch of a vehicle resulting from system or engine failure. Rocketry has been difficult over the years, and international players in the industry are constantly attempting to learn from any failures. This paper aims to decrease material, resource, and payload waste while ensuring crew safety by focusing on the computational modelling and aerodynamic analysis of a single-stage launch vehicle. CATIA V5 was utilized to create the computational model of a triggered nose cone rocket booster while ANSYS was used to analyse the trigger nose cone at different angles of attack and determine how the trigger nose cone will behave in case of emergencies such as system or engine failure, which could lead to the complete explosion of the launch vehicle. Based on the current findings, the trigger nose cone is not in the safe zone when ejected at an angle of attack greater than 20° due to the shockwave's effect on its surface when ejected from the main body of the launch vehicle.

**KEYWORDS:** Post-launch, Engine failure, Single-stage launch vehicle, Trigger nose cone, Combustion chamber.