

## Editorial

This Volume 37 Number 2 includes eleven (11) research articles. The relevance and usefulness of respective articles are summarised below.

**C.R. Cameron and G.S. King**, “An Assessment of The UWI’s Faculty of Engineering Capability and Willingness to Engage in Industrial Collaboration for Innovation”, discuss the importance of University-industry collaboration (UIC) and develop a Conceptual Model of good practice in UIC which has four pillars, namely 1) high quality academic research; 2) a predisposition on the part of academics to engage; 3) a framework of supporting policies and procedures in the university; and 4) an effective office supporting technology transfer. The capability of The UWI Faculty of Engineering for UIC was assessed against the Model. Among the limitations identified, publications data shows that the relatively low international visibility and impact of research undertaken in the Faculty might harm confidence in potential industrial partners. The university policy framework does not create sufficient incentives for definite UIC initiatives to be established.

**R.J. Rodriguez and W.G. Lewis**, “Exploring Potential RF Hot Spot Locations in Confined Spaces of Large Wave Guide Dimensions”, focus on quantifying location characteristics and intensities of Radio-Frequency (RF) waves propagating within empty rectangular structures likened to those of communication waveguide structures, through the proposal of a theoretical model for predicting the locations and intensities of RF hot zones containing RF hot spots. The significance of this work lies in being a tool for RF safety practitioners who can, without the use of cumbersome equipment and necessary skills for measuring RF, use a less expensive and user friendly method for determining the level of RF safety in a confined space by simply knowing its internal dimensions and material of the surfaces; and the RF source characteristics. The work can provide the IEEE standard body with useful information to include in its guidelines.

**R. Hosein and R. Mayrhou**, “A Model for Extending the Analysis of the Heptanes Plus Fraction for Trinidad Gas Condensates”, discuss the need of accurate description of pseudo-component compositions for Equation of State predictions for gas condensate systems. These extended experimental data are often unavailable and must be generated using mathematical models, of which the exponential and the three-parameter gamma distribution functions are the two most widely used. The Model described in this study resolves the discontinuities in the molar relationships at both SCN8 and SCN12 with an Average Absolute Deviation between the predicted and experimental compositions of less than 10 percent. It is claimed that this model can quite easily be included in Equation of State packages for a more accurate description of compositions for Trinidad gas condensates for performing compositional simulation studies. A partial analysis beyond the C<sub>7+</sub> fraction is not required with this new model.

**E.I. Ekwue, R.C. Constantine and R. Birch**, “Simulation of Irrigation Water Requirements of Some Crops in Trinidad Using the CROPWAT Irrigation Software”, present the design of irrigation schedules for the nine major crops grown in different predominant soils during the dry season for twelve (12) major farming locations in Trinidad. Crop and field parameters were obtained from published texts whereas the climatological data were obtained from the Water Resources Agency in Trinidad. The irrigation schedules using CROPWAT computer software package were planned in such a way that for the convenience of the farmer, the irrigation depth and irrigation interval were kept constant throughout the growing season for each crop and this value depended on the climatological situation or the water consumption pattern of the crops.

In their article, “Development and Evaluation of Wheeled Long-Handle Weeder”, **S.O. Nkakini and A. Huseni** present the design, construction and testing of a push-type operated wheel weeder with an adjustable long handle. The hoe performance from the tests on a field of Okra plant having an inter-row spacing of 800mm, showed that it could weed satisfactorily, and eliminate the drudgeries associated with the use of the short handle hoe. Field capacity and efficiency of 0.050ha/hr and 87.5% were obtained, respectively. Moreover, the average weeding index and performance index obtained were 86.5% and 1108.48, respectively. At a speed of 0.04m/s, a high efficiency of 91.7% at 0.4m depth of cut was obtained.

**S.A. Oke, D.E. Ighravwe and G. Shyllon**, “A Robust Regression Approach for Excess/Shortage Spare Parts Cost Estimation”, investigate the development of a predictive model for estimating the amounts of spare parts holding and the cost effects of poor spare parts holding in a system. The model uses an integrated methodology of the penalty cost and the wear technique for the unconstrained optimisation of the excessive spares using big-bang big-crunch (BB-BC) algorithm. It is validated by comparing the results obtained using the in-sample analysis with an out-sample approach. The model is infeasible to track spares and to evaluate the cost of excess/shortage of stockings of multi-items in spare parts inventories.

**K. Ramesar, C. Maharaj and U. Persad**, “A Mechanism for Cutting Coconut Husks”, describe a conceptual design of a machine for cutting coconut husk halves into pieces for activated carbon production. Alternative interlocking and welded blade arrangements are presented with the potential for scaling up the processing of coconut husks into smaller pieces. Virtual simulations and the experimental testing of a functional prototype are used to validate the conceptual design. It is claimed that the design is functionally acceptable, with directions for further improvements and development.

**I.O. Oladele**, “Mechanical Properties of Steelmaking Slag Reinforced Polyester Composites”, assesses the viability of utilising steelmaking slag for reinforcing polyester matrix to form composites with improved mechanical properties. Slag was prepared by crushing and pulverizing, and then sieved into 75, 106 and 300  $\mu\text{m}$  sizes and, varied masses of the particles were used to develop the composites by reinforcing the unsaturated polyester resin with the steelmaking slag particles. The homogeneous mixtures were poured into the flexural and tensile tests moulds and allowed to cure before being stripped from the moulds. The samples were further allowed to cure for 30 days before carrying out the mechanical tests. The results showed that the composites produced have gained increment in these properties.

In their article, “Rheological Study of Cement Modified with a Lignin Based Admixture”, **R. Maharaj, L.H. Grierson, C. Maharaj and V. Ramjattan-Harry** investigate with experiments the changes in the rheological properties of Trinidad Portland cement paste blended with Lignosulfonic acid, acetate sodium salt additive. The rheological properties of plastic viscosity (PV) and yield stress (YS) of the cement blend were calculated. It was found that a PV value of 0.7 centipoise obtained with the control sample can be reproduced with the addition of approximately 0.05% admixture using 20% less water. Maximum values of YS generally occur between 0.05% and 0.10% admixture concentrations as a more compact, homogeneous paste system develops. The ability to synthetically alter the rheological properties of Trinidad Portland cement adding a lignin based admixture can serve to optimise the strength, workability and shrinkage due to the reduced water-cement ratio.

**E.I. Ekwue, R. Birch and J. Chewitt**, “Effect of Dynamic and Static Methods of Compaction on Soil Strength”, investigate the effect of static (hydraulic press) and dynamic (Proctor) methods of compaction on the strength of soils in the laboratory. Soil samples of different densities were obtained by incorporating peat into three agricultural soils. Results indicate that as long as the same soils are compacted statically or dynamically at the similar moisture contents to same bulk densities, similar strength values are expected. The effect of method of soil compaction on soil strength is not important.

**K.F. Pun**, “A Strategic Initiative on Enhancing Postgraduate Throughputs at The UWI St. Augustine Campus”, reviews the key areas of priority for the Campus for the period 2014-2017, and informs the strategic initiative with a proposed Throughput Enhancement Project (TEP) at The UWI St Augustine Campus. It presents the structure of TEP and a schedule of its implementation. For facilitating the TEP initiative, project leaders and process owners are identified, and resource requirements versus savings are explored. The paper concludes by discussing the evaluation of the TEP efficacy in relation to achieving the Research and Innovation strategic goals of The UWI.

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KIT FAI PUN, *Editor-in-Chief*

Faculty of Engineering,  
The University of the West Indies,  
St Augustine, Trinidad and Tobago  
West Indies

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