

Paper - 1

## **Plastic Segregation Using Combination of Different Sensors for Effective Solid Waste Management**

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***Abstract :** Plastic waste has been a constant threat to the earth and the mankind. This non-degradable waste is constantly being accumulated in large quantities and is disturbing the ecosystem. The one of the best solution till now is to recycle it but it is a hard task to segregate it from the municipal waste. Therefore we want to promote the segregation of plastic at the consumer level . By implementing our solution, plastic shall be segregated while disposing the waste itself. People can be motivated to do so by rewarding them through small incentive. We intended to make an eco-friendly and automatic device which doesn't involve any harmful chemicals. A business model has been designed and associated with the device to generate revenue by the plastic recycled and use it to keep the system running.*

Paper - 2

## **Effect of Self-learning Modules on the Achievement of Air Warriors- An Empirical Study**

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***Abstract :** In recent years the concept of modular instruction in the form of printed material or computer assisted instruction has been seized upon by some academicians as a solution to the apparent inflexibility of the diverse needs of individual learners. One such methodology commonly used for participative learning is by using printed self-learning modules. It challenges students and makes them more independent, to help the students achieve meaningful learning, to be able to find logical interrelationships among data, to respect different points of view, to be flexible and rethink their opinions when reason leads them to do so. Technical education in general by its very nature demands these outcomes from the learners; effective learning materials to suit to individuals needs would help to a great extent in achieving these objectives. Hence the Self-learning materials in this study we have find its place of importance in the present and future scope in technical education as well.*

## Empirical Relation to Predict the Improvement in Mechanical Property by Equal Channel Angular Extrusion (ECAE) Through Simulation

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**Abstract :** Equal Channel Angular Extrusion is the most important technique of severe plastic deformation, in which the plastic deformation is imposed on the material to improve the mechanical property of the material. This work attempts the analysis of equal channel angular extrusion process using finite element method. The 2D plane strain model is used for the analysis. Geometric parameters such as corner angle  $\psi$ , change angle  $\psi'$  were used for the analysis. Simulation of multipass equal channel angular extrusion have been performed to establishment of empirical relation between simulated results to experimentally observed improvement in mechanical property for equal channel angular extrusion. Generalization of empirical relation for group of materials has been done, for this four different Al-alloys 6010AA, 1050AA, 5083AA, 6082AA, 7010 were used.

## Effectiveness of E-content Learning Material in Terms of Knowledge Attainment of Undergraduate Students

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**Abstract :** In the present study an attempt has been made to find out the effectiveness of e-content in terms of knowledge attainment of undergraduate students. A sample of 40 undergraduate students was selected randomly. The pre test post test single group design was followed to give treatment of e-content to the selected sample. The data was collected by administering Knowledge Attainment Test before the treatment and after the treatment. The obtained data was analysed by using statistical techniques namely Paired Sample t-test and Coefficient of Correlation. The obtained results show that the study of e-content is significantly in enhancing the knowledge attainment of undergraduate students.

## Study of Flyash Application for Infrastructural Development in Bihar

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**Abstract :** Flyash is available in abundance in the thermal power plants as a by-product. The disposal of flyash is itself a problem which has attracted the attention of Engineers and administrators. Various investigations are being carried to make the best use of flyash but so far known till now, the use of flyash is limited to an extent of 3% only, where as this amount is upto 80% in foreign countries. The largest potential for flyash applications is manufacturing of bricks. Billions of bricks are required annually, and even if 40% of these are made of soil flyash mixture, this will solve to a great extent the problem of disposal. There is a very wide scope for manufacture of bricks with soil – flyash mixture. The new manufacturing process utilizes 70% to 85% of flyash as main raw materials in manufacturing flyash cement, sand, bricks.

## Stabilization of Subgrade Soil by Using Demolished Concrete Waste Material

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**Abstract :** In this study, a detailed experimental investigation has been carried out to utilize fines obtained from demolished concrete waste as soil stabilizing material for improving the property of soil and to make it suitable for the use as subgrade for road construction. Various tests were carried out on the virgin soil to find out its engineering properties like Atterberg's limit, specific gravity, optimum moisture content & maximum dry density, etc. Soil sample was collected from a village called Bhouri about 22 Km from Bhopal town. Soil samples were prepared by mixing fines in varying percentages (i.e. 0, 2.5, 5, 7.5, 10 and 20 %) and its strength were evaluated by California Bearing Ratio (CBR) test. Results were compared with the strength property of the virgin soil sample.

## Cost Evaluation of Reactive Power with FACTS Devices in Deregulated Power Systems

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**Abstract :** In a deregulated power system environment, reactive power support has been identified as one of the essential ancillary services for transmission of active power, control of voltage and normal and secure operation of a power system. Since generators are the main source of reactive power generation hence the cost of the reactive power should be considered for their noticeable impact on real and reactive power generation. But the transport of reactive power supplied by generators over long distances causes many technical difficulties. In such situation, local reactive power support becomes essential and beneficial also. The cost model of reactive power support from Static VAR Compensators (SVC) and the Thyristor Controlled Series Controllers (TCSC) along with generator is developed and evaluated in this paper. A Particle Swarm Optimization- Sequential Quadratic Programming (PSO-SQP) algorithm is developed to evaluate the cost of reactive power generation with FACTS devices considering capability curve of generator. The proposed approach is applied on modified IEEE-14 bus test case systems. In this paper an objective function is formulated to evaluate the cost of reactive power while maintaining the minimum specified Voltage Security Margin (VSM) along with other constraint.

## Rotation Dynamics of Northern - Sky Spiral Galaxies

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**Abstract :** Present paper is an attempt to understand the dynamics of Spiral Galaxies. Rotation curve data of Northern Sky Spiral Galaxies provided by Courteau is taken for the study. Two models, Linear Model and Set of Linear Models are discussed. Analysis under both of these models is based on the shape of rotation curve of galaxy. Power-law ( $V = AR^k$ ) hypothesis and linear regression correlation are applied to outline the rotation dynamics of galaxies

## Route Planning and Feasibility Study of Metro Rail Route in Bhopal City by Using GIS and GPS Technology

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**Abstract :** In this study, Route Selection and Station Location were optimized by using GPS and GIS Technology. The ground control points (GCP) were determined with help of GPS surveying and were analyzed by using Arc GIS 10.3. The Analytic Hierarchy Process (AHP) has been used to select the suitable GCP and Mosaic have prepared with the help of Google Images to check the suitability of GCP. The optimized route for proposed Metro Rail Route in a part of Bhopal city was determined by using Spatial Multi-Criteria Decision Making.

## Designing of Supplementary Controller for STATCOM for Mitigation of Oscillations in Power Systems

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**Abstract:** In Power System Stabilizers (PSS) and FACTS devices, supplementary signals are widely used to enhance damping and mitigation of Subsynchronous Resonance in Power Systems. Subsynchronous Resonance occurs due to series capacitor in the Power Systems. High value of series capacitive reactance may destabilize low frequency mode which is more dangerous. In this paper modeling of STATCOM with IEEE first benchmark model is presented. Then a novel technique to select supplementary signal is developed, which is based on pole zero plot and root locus. In the literature, it has been described that the supplementary signal which has less number of zeros in the right hand side of s-plan that should be the best choice of supplementary signal, but in this paper it is shown that location of zeros are more important instead of counting of zeros. In this paper it is shown that the supplementary signal which has less number of zeros in the vicinity of torsional mode that must be the best choice of supplementary signal.

## Effects of Diaphragm on the Design of Regular and Irregular Building Frame

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**Abstract :** In structural engineering, Diaphragm is a flat structural unit acting like a deep or thin beam. It is a structural system used to transfer lateral loads to walls or frames primarily through in-plane shear stress. These lateral loads are usually wind and earthquake loads, but other lateral loads such as lateral earth pressure and hydrostatic pressure are also resisted by Diaphragm action. Diaphragms are usually constructed of metal deck or composite metal deck in steel and a concrete slab in concrete construction. This study mainly deals with the behavior of the regular and irregular building frames having different diaphragm condition against seismic loading condition. These results will be equated on the basis of different analysis factors i.e. base shear, support reaction, joint displacements, maximum moment in a member, area of steel in a sample column member and total quantity of concrete and area of steel used in building frame.

## Design and Development of a Milling and Metal Cutting Attachment on Lathe

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**Abstract:** Manufacturing by metal removal process has a vital role in the manufacturing industries. Different shapes and size of work pieces are manufactured by this method. More and more investigations are carried out to make it user friendly, economical and available to all class of industries from small scale to the MNCs. For the investigators and engineers it is not enough that they become able to develop new automatic and semi-automatic machines but it is equally important to utilize the available recourses with some modifications. An attempt has been made in this work to design and develop a milling and metal cutting attachment which can be attached to a conventional lathe and used for limited milling operations such as profile cutting, T slot milling, parting of using metal slit saw etc.

## A Comparative AHP-Topsis & Topsis Approach in the Selection of R14-Tyres

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*Abstract* : Tyres strength plays a vital role in vehicles safety. The main criteria on which strength depends are Ply Adhesion, Belt to Tread, Hardness Tread, Hardness side wall. Selection of tyres become more complex as the buyer in the market has to assess a wide range of alternatives based on the set of criteria. This means that selection of tyres is a (MCDM) problem. This paper aim to discover applicability of combine AHP-TOPSIS approach for R14-tyre selection problem and compare this approach with standard TOPSIS in which weights of the criteria are equal. In this paper (AHP) and (TOPSIS) methods are used together for ranking the alternatives. AHP method is used to extract the relative weight of the criteria by pair-wise comparison matrix and then tyres have been upgraded by doing the analysis of alternatives and criteria through TOPSIS method. Finally AHP-TOPSIS result has been compared with TOPSIS result.

## Relevance of Test of Normality in Selected Companies of Private and Public Manufacturing Data Sets

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*Abstract* : Reviewers of research reports have often criticized the choice of statistical methods. While some of these criticisms are firmly founded, frequently the use of various parametric methods such as analysis of variance, regression, correlation are faulted because the sample size is too small, or the data may not be normally distributed. In this study, it is highlighted that t-Test and regression is valid for small samples if the outcome variable is normally distributed. It is incorrectly assumed that these tests are valid for only normally distributed outcomes. In this paper, an attempt has been made to demonstrate this validity on non-normal data.