CITY UNIVERSITY PESHAWAR - PAKISTAN

4th

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Skilling Pakistan

Pak-Austria Fachhochschule:
Institute of Applied Sciences and
Technology, Pakistan.

INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN ENGINEERING, MANAGEMENT & SCIENCES (ICETEMS-2021)

BRIDGING GAPS THROUGH MULTI-DISCIPLINERY RESEARCH AND INNOVATION FOR SUSTAINABLE DEVELOPMENT

Project Management
Time
Scope Cost

Recruitment
Human Resource
Seminar
Evaluation
Team

ABSTRACT BOOK
OCTOBER 13 - 14, 2021

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4th International Conference on Emerging Trends in Engineering, Management and Sciences (ICETEMS-2021)

"Bridging Gaps through Multidisciplinary Research and Innovation"

October 13-14
Peshawar - Pakistan

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4ᵗʰ International Conference on Emerging Trends in Engineering Management and Sciences (ICETEMS-2021)

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Foreword

Today, the developing world is faced with multitude of challenges, which include modernizing infrastructures, enhancing technological resources, and developing human assets to attract more Direct Foreign Investment (DFI). Though the Governments are investing a lot of resources to cater with these problems, yet sustainable and cost-effective solutions are still not explored. This certainly requires collaborative and integrated efforts of Engineers, Managers, Scientists, Policy makers, industrialists, business community etc. City University of Science and IT initiated a Conference series under "International Conference on Emerging Trends in Engineering, Management and Science (ICETEMS) in 2014. The first conference of the series (ICETEMS-2014) was held on Dec 28-30, 2014 at Pak-China Friendship Centre Islamabad while the second and third ICETEMS were held in Dec 2016 and Oct 2018 respectively at City University of Science and Information Technology, Peshawar, Pakistan with participants from across the globe.

It is a matter of great pleasure for the organizing committee of (ICTEMS) that the third Conference of the series ICETEMS -2018, is being held at City University Peshawar. ICETEMS, is an endeavour to bring together all major stakeholders of the society for exchange of thoughts and experiences regarding the concepts, trends and practices pertaining to the major areas of Engineering, Management and Sciences. ICETEMS is our flagship event, and will provide an international forum for the discussion on important topics and emerging trends to develop new knowledge in engineering, management and sciences. The focus of the conference is to promote cutting edge interdisciplinary research in these core areas, so that efficient and cost-effective solutions are explored for the contemporary problems and issues. We are expecting a well-informed gathering, with the hope that scientists and researchers from industry and academia, public health professionals, clinicians, business delegates, manufacturers, and engineers will exchange ideas and collaborate for the sustainable development of Pakistan. This is also reflected in the theme of the conference *"Bridging Gaps through Multidisciplinary Research and Innovation for sustainable development"*.

We sincerely hope that you will continue to support our efforts.

Thanks, and best regards

Mr. Mohammad Sabur Sethi
President
City University of Science and IT, Peshawar, Pakistan

Message from Conference Chair

Prof. Dr. Syed Minhaj ul Hassan
Vice Chancellor
City University of Science and Information Technology, Peshawar

On behalf of the 4th International Conference on Emerging Trends in Engineering, Management, Sciences and Social Sciences (ICETEMS 2021), jointly organized by City University of Science and Information Technology Peshawar, and Karakoram International University, Gilgit. It's a pleasure to welcome the anticipating participants. It is a great honor and privilege for me to serve as the Co-Chair of this International conference. ICETEMS has really brought together a tremendous and rich diversity of authors and speakers from universities, government and industry around the world to share ideas and new perspectives on a wide range of topics that includes communications, engineering and computing research, technologies and last but not the least social and political issues, addressing new technical and business issues essential to advancing today's engineering and technological environments.

The popularity of ICETEMS as the premier forum for communications, engineering, business and computing research has started to grow. The ICETEMS has already become a prominent forum, where researchers and practitioners openly exchange ideas and report progress in the exciting area of communications and networking. This year we have also included Social Scientists among our distinguished guests thus ICETEMS will deliver a stimulating, informative and delightful program. We greatly value the participations and look forward to the insightful vision and thoughts of the invited speakers. Thanks also go to the distinguished professors, invited talks and participants. I would like to extend my most sincere congratulations to the authors and speakers for their contributions. It is their efforts and vision which provided the impetus to put together this outstanding technical program. The excellence and success of ICETEMS would not have been possible without the support of our sponsors. We greatly appreciate all our sponsors and well-wishers. It is my great honor and pleasure to accept the responsibilities and challenges of Conference Chair. I hope that the conference will be stimulating, informative and enjoyable to all who attend it.

Message from Conference Co-Chair
Engr. Prof. Dr. Atta Ullah Shah
Vice Chancellor
Karakoram International University, Gilgit

It is a matter of pleasure and honor for me to be part of the organizing committee a Co-Chair of 4th International Conference on Emerging Trends in Engineering Management and Sciences (ICETEMS-4), being organized by City University of Science and Information Technology (CUSIT) on Oct 13-14, 2021 in partnership with Karakoram International University Gilgit Baltistan besides other national and international partners.

The conference series was started in Dec 2014, at Pak China Friendship Centre Islamabad, which was followed by second conference in 2016 at CUSIT Peshawar. The third conference was jointly held at CUSIT and KIU in Oct/Nov 2018. ICETEMS-4 was though planned in 2020, but due to stringent restrictions on travelling and physical meetings, it was delayed to Oct 2021. I appreciate the efforts of the organizing committee and Chair of the Conference, which the conference has been arranged despite of all odds. Cumulatively in the last three conferences about 400 research abstracts were presented and this time, we expect about 150 plus abstracts, to be published in the conference proceedings and presented in the hybrid modes.

We are also working with some of the renowned publishers for publishing the Conference Proceedings. At the same time, outstanding research papers will be referred for publishing in the HEC approved Y Category Journals i.e. City University Research Journal (CURJ), City University Research Journal of Literature and Linguistics, Journal of Mountain Areas Research (JMAR) of KIU, after peer reviewed process, as per HEC & Journal requirements.

ICETEMS series of Conference has attracted good number of quality research papers since 2014 in the diverse fields of Engineering Sciences, Natural Sciences, Social Sciences and Arts & Humanities etc. The increasing number of the abstracts submissions in the conference also reflects the commitment of President, Vice Chancellor and organizing committees of CUSIT, and hard work of the editorial and technical review teams. As envisioned in the first conference in 2014, the mission of the ICETEMS conferences is to facilitate communication between multidisciplinary teams, especially those involved in engineering, management and Sciences to share their research on the emerging trends in these areas with special reference to Pakistan.

On behalf of Karakoram International University as Co-Chair and Co-host with City University of Science and IT Peshawar, I take the honor to welcome the delegates to this conference and expect that these deliberations in this cross disciplinary platform will create venues for more collaboration amongst the Higher Education Institutes and Faculty across the country, KP and entire world. The next part of the conference has been planned in Spring 2022 at Karakoram International University and the details will be shared with you all in due course of time.

Message from Member Board of Governors, City University of Science & IT, Peshawar

Dr. Nasser Ali Khan PhD, Project Director, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology (PAF-IAST), Mang, Haripur, Khyber Pakhtunkhwa

It is pleasing to know that City University of Science and I.T. is holding "4th International Conference on Emerging Trends in Engineering, Management and Sciences (ICETEMS-2021)" on October 13-14, 2021. My message is about lifelong "learning and development". Staying in touch with fresh and emerging evolutionary developments of science and technology.

Irrespective of age, one can dedicate his life to learning, and make this a lasting commitment. In fact, we find that devoting our life to our own happiness alone, loses its charm with the passage of time. Let me assure you that all of us are born with special attributes which can be used to make a difference, all in our unique ways. Today's challenge is to create a new technological world based on our values. At the same time, we must transform our economy, governance, education, religious values, media, and sciences, so that they reflect our highest standards of ethics.

We must continue to learn from each other, as we are all in this process together, challenged with advancing the great transition in technologies and social life.

I wish you all a very fruitful and rewarding conference.

Message from
Prof. Dr. Mohammad Mujahid,
Rector
Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology
Mang, Haripur, Khyber Pakhtunkhwa

It is a matter of great pleasure for me to know that City University of Science & Information Technology, Peshawar is organizing "4th International Conference on Emerging Trends in Engineering, Management & Sciences (ICETEMS-2021)" on October 13-14, 2021.

The interaction of engineers, academicians; and scholars from national and international organizations will go a long way in knowledge sharing in diverse fields for the promotion of research culture in the country. Providing a platform to people and researchers for the promotion of research will immensely benefit young scholars participating in the conference.

I am convinced that the conference will definitely provide a platform to the participating delegates to discuss important issues to develop new knowledge in engineering, Information and Technology, Management and Sciences.

Being partner of the conference, I heartily welcome all the distinguished Speakers, scholars and researchers presenting papers and the participants to this 4th International Conference.

I congratulate the City University President, Vice Chancellor, Teaching Faculty, Students and Administration for organizing this conference and pray for the successful accomplishment of objectives.

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ARTIFICIAL INTELLIGENCE

A Novel Machine Vision-based X-ray Investigation for Various Chest Disease Detection

Rehan Khan[1], Shahzad Anwar[2]
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Abstract: Chest diseases such as lung cancer, pneumonia, COVID-19, and tuberculosis are the main causes of disability and ultimately lead to mortality; consequently, Millions of people suffer globally from various chest diseases. Therefore, this study proposes a non-invasive, contactless machine vision-based chest disease early detection system. The developed method incorporate Machine and Deep Learning-based artificial intelligent system. The method includes, data acquisition initially followed by preprocessing step for the selection of region of interest. Chest X-ray (CXR's) images were acquired from well publicly available medical databases for experimentation. Various feature extraction techniques, such as Local Binary Pattern (LBP), an improved version of Grey Level Co-occurrence Matrix (GLCM), and Histogram of Oriented Gradients (HOG), were employed for extraction. Furthermore, statistical features, for instance, mean, mode, median, skewness, and kurtosis were employed to develop a multi-class ensemble classification model. The developed method was compared with other methods, and result exhibits a superiority of 95% accuracy in terms of investigation of various chest diseases at early stages.

Machine Vision-Based Tomato Plant Diseases Detection

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Abstract : Tomato is a cash crop and significantly contributes toward the county's economic growth. In the past decade, the tomato crop is deprived due to various plant disease infections consequently less production. This study focuses on machine-vision based early crop (tomato leaf) disease detection, to avoid crop loss. For this reason tomato leaves as texture incorporated via employing single shot box detector method (SSD) for feature extraction (leaf surface texture), aiming for the identification of three prevalent species i.e., Bacterial, Septoria and Yellow leaf curl disease. The dataset include 1×10^3 images; the Data augmentation step was performed to increase the dataset to 3×10^3. For feature extraction, ensemble feature model along with VGG16 and Resnet were fused. The results were compared with other methods and exhibit the superiority of the proposed method by 95.6%. The developed techniques could effectively determine disease type at an early stage.

Keywords: SSD, Machine Vision, Deep learning, Leaf Disease Detection, Texture analysis.

A Vision-Based Pakistani Sign Language Recognition System Using Machine Learning

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Abstract: In Pakistan, more than 250,000 deaf Pakistanis use Pakistani Sign Language (PSL). Communicating with others can be a major issue for the deaf people. A sign languages (SL) recognition system would greatly benefit these people. The objective of this study was to develop a vision-based system for the recognition of static PSL alphabets using Bag-of-Words (BoW) and Support Vector Machine (SVM) techniques. A total of 511 images were collected for 36 static PSL alphabet signs from a native signer of PSL. The SL recognition system used the collected images as input, and converted them to grayscale. The grayscale images were segmented using Thresholding technique and Speeded Up Robust Feature (SURF) were used to extract the features. The obtained SURF descriptors were clustered using K-means clustering. A BoW was formed by computing the Euclidean distance between the SURF descriptors and the clustered data. The codebooks obtained from the BoW were divided into training and testing using 5-fold cross validation. The developed system yielded a highest overall classification accuracy for static PSL signs of 97.87% at 1,500×1,500 image dimensions and 500 Bags.

Keywords: Pakistani Sign Language, Pattern Recognition, Image Processing, Machine Learning

Classification of Healthy Skin and Plaque Psoriasis via Convolutional Neural Networks

(Ref No. ICETEMS-21-101)

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Abstract: Psoriasis is an inflammatory skin disorder which stems from genetic, ecological and immunological factors. According to the latest statistics, Psoriasis affects 125 million people worldwide. The most common type is the plaque psoriasis that encapsulates elevated and dry lesions that are red in colour and tend to cause severe itching. Hence, the objective of our study is to propose a novel technique for classifying healthy skin and plaque psoriasis using the deep learning method of Convolutional Neural Networks (CNNs). This is accomplished by constructing a new annotated dataset consisting of 271 images. This includes one hundred and seventy-two images of normal skin and ninety-nine plaque psoriasis images. The images are classified with the aid of a visual geometry group-19 (VGG-19) pre-trained convolutional neural network. The results of our study exhibit a total of 55 images being tested and yielding an accuracy of 84.2%. Hence, it can be concluded that the accuracy reported exhibits the potential of deep learning techniques, in particular, CNN to achieve robust performance and classification.

Keywords: Psoriasis, Deep learning, Convolution neural network (CNN), Visual geometry group (VGG19)

COMPUTER SCIENCES & IT

Model for Component Based Outsourcing Software Development

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Abstract: Component-based software engineering is very useful to develop high-quality and secure software within limited time and money as well. This approach is implemented by many software outsourcing vendor organizations; however, it is important to identify the success factors that have a positive impact on software outsourcing vendor organizations in adapting the concept of the component-based approach of software development. In this research, we identify the success factors that have a positive impact on software outsourcing vendor organizations in adopting the concept of a component-based approach to software development. In the first phase, data will be collected and verified through a systematic literature review and questionnaire survey. In the second phase the final data will be synthesis accordingly. In the final phase, the analytic hierarchy process method will be used to prioritize success factors and their categories based on their relative importance.

Keywords: Component based software engineering; AHP, software outsourcing vendor organization;

Transfer Learning-Based Feature Ensembling for Multi- Class Detection of Cov-19 and Pneumonia Using Lungs X-Rays

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Abstract: The entire world is trying to stop the rapidly spreading of the Covid-19 pandemic, causing significant public health and socio-economic issues around the globe. Early detection and identification of Covid-19 is a significant task. The aim of this study is the early detection and classification of Covid-19 and Pneumonia with the help of deep learning using Lungs X-ray images. In the proposed method, Lungs X-ray images are enhanced to create clearer images from which the object and structural features in the images can be properly recognized by the system. Data augmentation technique is proposed to increase the size of the dataset. The performance of the CNN model is not satisfactory on low datasets; therefore, the concept of transfer learning has been proposed. The proposed method extracts feature from pre-trained CNN architectures, namely GoogleNet and SqueezeNet. It then transfers the knowledge to a fully connected layer of our customized CNN architecture to classify Pneumonia and Covid-19 disease. The proposed method gives fast and accurate results compared to the traditional reverse transcription-polymerase chain reaction (RTPCR) technique and achieved 98% accuracy.

Keywords: Covid-19, CNN, Ensembling, Transfer Learning, Lungs X-rays images.

EDUCATION

A Correlational Study of Test Anxiety and Students' Academic Performance at College Level in Khyber Pakhtunkhwa, Pakistan

(*Ref No. ICETEMS-21-095*)
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Abstract: Anxiety is a common phenomenon among the students when they have to appear for test. The situation gets worst if the student is subjected to greater expectations. The students may face mental tension, affective imbalance and procrastination. This study endeavored to highlight the stresses and strains a student undergoes in such situations. The study investigated the students' test anxiety encompassing Cognitive, Affective and their tendency of Procrastination. The study employed survey method to collect the data through two adapted questionnaires. Population of the study comprised all the students of class 2nd year studying in Public and Private Colleges in District Peshawar. The sample was selected on random sampling techniques which consisted of 200 students both equally from boys and girls colleges. The data collected on 5 points Likert scale was processed on Statistical Package for Social Sciences (SPSS)-24. The main independence variable of the study was Student Test Anxiety having three sub variables as Cognitive, Affective and Procrastination which were measured through an adapted instrument developed by Cassady, and Johnson, (2002), The main dependent variable was students' Academic Performance which was measured by instrument developed by applying DePaul J.G., Rapport D.M & Perriello M.L (1991).The data analysis was carried out by applying various statistical tools like Descriptive statistics, One Sample t-test, Independent Sample t-test and Pearson Correlation. The study established significant correlation between the test anxiety and the students' academic performance. The study confirmed the positive correlation between cognitive and affective test anxiety and the students' academic performance. However the students' Procrastination was found insignificant. It recommended that the school management may take measures to contain test anxiety among the students. For example the timely completion of the course work, revision, testing and retesting, and satisfying the students regarding their doubts. The results concluded that test anxiety with in the manageable range enhances the students' Academic Performance.

Keywords: Cognitive Test Anxiety, Affective Test Anxiety, Procrastination Test Anxiety, Student's Academic Performance

Correlation between Principals' Leadership Styles and Teachers' Perception Regarding Their Conflict Resolution Strategies at Secondary Level in Khyber Pakhtunkhwa

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Abstract: The present study was conducted to determine the relationship between Principals' Leadership Styles and their choice of Conflict Resolution Strategies as perceived by teachers. The population of the study was all the secondary school teachers at Khyber PukhtunKhwa. The target population of the study comprised secondary school teachers of District Peshawar. The sample consisted of 240 secondary school teachers equally divided between public and private sector male and female schools. The perception of the teachers was solicited through an adapted 5 point Likert's Scale questionnaires adapted from Mugenda and Mugenda (2003) for Principals' Leadership Styles and Kombo & Tromp, 2006 for Conflict Resolution Strategies, respectively. The data so collected were processed through Statistical Package for Social Sciences version 26. The data was analyzed applying various statistical tools such as Reliability, Descriptive Statistics, Frequencies, Pearson's Correlation analysis and Independent Sample t-test. The findings of the study confirmed the positive and significant correlation between the independent variable i.e. Principals' Leadership Styles and dependent variable, their choice of Conflict Resolution Strategies. The independent variables included (Transactional, Transformational and Laissez-faire) and dependent variables included (Integrated, Obliging, Dominating, Avoidance and Compromising). The study established relationship between various Leadership Styles and Conflict Resolution Strategies. Did not find any significant differences between the responses as perceived by public, private and male, female respondents regarding the Principals' Leadership Styles and their Conflict Resolution Strategies. The study suggested that the Principals should adopt the conflict Resolution Strategies according to their Leadership Style.

Keywords: Transactional Leadership Style, Transformational Leadership Style, Laissez-Faire Leadership Style, Conflict Resolution Strategies.

A Correlational Study of Mindfulness and Students' Academic Achievement at Higher Secondary Level in District Peshawar, Khyber Pakhtunkhwa

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Abstract: The study at hand is correlational research. The primary aim of this study was to determine the relationship between the five facets of mindfulness and students' academic achievement at the higher secondary level. The main objectives of the study were; a) To assess the level of association between the five explanatory variables and the students' academic achievement; b) To determine the difference, if any, between the level of mindfulness across the sector, gender and locality; c) To evaluate the level of contribution of five independent variables towards dependent variable i.e. students' learning. The population of the study comprised all the 2nd year students of government and private higher secondary schools in the Khyber Pakhtunkhwa. A sample of 240 students was selected randomly out of purposively selected 24 higher secondary schools. The research instrument Five Facet Mindfulness Questionnaire (FFMQ) was adopted for the collection of data. The study found the significant relationship of 3 out of 5 facets of mindfulness (observe, act with awareness and non-reactivity to inner experiences) with students' academic achievement whereas the other two (describe and non-judging of inner experience) has no relationship with students' marks. The study also found significant differences between public and private students regarding their perceived mindfulness. The study found no differences between boys/girls and rural/urban students regarding their perceived mindfulness. Therefore, it was pertinent to recommend that the educational managers and policy makers may take appropriate measures to incorporate a concept of mindfulness in the training packages of teachers' pre-service and in-service professional training.

Key Words: Mindfulness, Academic Performance, Observe, Describe, Act with Awareness, Non-judging of Inner Experience, Non-Reactivity to Inner Experience.

Role Of Students' Attitude, Teachers' and Parents' Support Towards Efficacy of On-Line Learning

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Abstract

Education is a constant process both formally and informally. Any gap in the educational process may become a black hole to swallow what was already learnt. On- line learning has been in use selectively by advanced countries and reputed universities to accommodate remote learners. It has established the quality of ease and access to remote students who could not afford such lecture on campus. However, since outbreak of COVID-19, on-line teaching and learning became only choice for students and educational institutions. The level of its usage reached highest levels and unfortunately the world was not prepared for it. The developing countries were hit hard. Pakistan like many other developing countries was caught on wrong step. Totally unprepared, it was a gigantic task both at public and private sector educational institutions to tackle the situation.. The study in hand is also an effort to focus on the issue of on line learning in broader perspectives and to investigate the effect of students' attitude, teachers' and parents' support on the efficacy of on line learning. The population of the study comprised all BS level students studying in public and private sector universities at Peshawar. The sample was selected on purposively sampling technique and consisted of 200 equally divided male and female students taken of 2 universities each from public and private sector. A questionnaire was developed that sought the express opinion of students. The responses were collected with the help of 5 points Likert's scale and processed through SPSS-24. The results established that students have hesitant approach to the on line learning whereas they believe that teachers' and parents' support can help in enhancing the efficacy of on line learning. The study recommended a close liaison between students , teachers and parents is need of the hour to reap the best of on line learning.

Keyword: On-line Learning.   Students' Attitude   Teachers' Support

Teachers' Perceptions Regarding Multi Grade Teaching and Its Impact on Students' Academic Performance at Primary Level in Khyber Pakhtunkhwa, Pakistan

(Ref No. ICETEMS-21-104)
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Abstract: Multi-grade teaching at primary level in Khyber Pakhtunkhwa is a broad area to research as it is a very old and traditional way of teaching as compared to the current advanced learning approaches with the help of ICT. The study was made to collect the perceptions regarding the multi-grade teaching at Primary level in Khyber Pakhtunkhwa, Pakistan. The population of the study were all teachers who teach in multi-grade schools at District Peshawar. There are 315 teachers teaching at multi-grade schools in Peshawar.120 teachers were selected as sample using purposive sampling technique. Data from the respondents were collected using Likert scale. A questionnaire adapted from Shehzad (2016) that had 4 variables Curriculum (CUR), Instructional Strategies (IS), Instructional Materials (IM) and Teachers Training (TT) as independent variable and Students' Academic Performance (SAP) as dependent variable was distributed among the respondents after pilot study, establishing its reliability. After retrieving the data, SPSS 24 statistical tests of Reliability, Descriptive Statistics, One Sample t-test, Pearson Correlation and Regression Analysis were used to reach at conclusions. The result established that Curriculum, Instructional Strategies, Instructional Materials and Teachers Training have statistically significant effect on Students' Academic Performance. The study established the efficacy and usefulness of multi-grade teaching in specific environment. The research also recommends need for further research on the subject.

Keywords: Multi Grade Teaching, Teacher's Perception, Student's Academic Performance

ENGINEERING AND TECHNOLOGY

Experimentally Study on Confinement Effect and Efficiency of Concentrically Loaded RACFST

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Abstract: Recycled aggregates concrete (RAC) is an environmentally friendly building material. Past research indicates that recycled aggregate concrete (RAC) could be successfully used in concrete-filled steel tubular (CFST) columns. This paper investigates the mechanical behavior of recycled aggregate concrete-filled steel tubes (RACFST). Specimens were designed and tested, under axial compression to obtain failure modes, failure loading, and curves on loading deformation and loading strain. Two factors were considered in the experiment which were recycled aggregates replacement percentages (0%, 50%, 70%, 90%, and 100%) and eccentricity in an effort to analyze consequences on mechanical property. The result shows improvement in the recycled aggregates steel tubes as compared to the natural aggregates steel tubes in aspects of bearing capacity, failure modes, deformation features, and strain distribution in section, particular attention should be given to the application of recycled aggregate concrete in actual structures.

Keywords: Steel tubular tubes, ductility, load-deformation relationship, recycle aggregates

To Study the Serviceability of Pedestrian Bridges and Underpasses in Pakistan

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Abstract: Pedestrian bridges and underpasses are the structures that provide excess to pedestrians to cross the roads. The main objective of this study is to analyse and evaluate the serviceability of pedestrian crossing facilities. Two pedestrian bridges and an underpass located on the national highway and major inter-city highways of Peshawar and Nowshera were selected for this research. These facilities' selection was based on different characteristics, i.e. the number of lanes, type of median barriers and type of facility (bridge/underpass). Pedestrian volume data including both grade-separated crossing and at-grade were collected seven days of the week for each facility. The grade-separated pedestrian crossing was recorded manually and at-grade pedestrian data was recorded using video photography. The data is categorized based on gender and age into four groups i.e. male, female, age<25 and age>25. The analysis shows that the majority of the pedestrians (83.73%) did not use the crossing facilities, resulting in the poor serviceability of these structures. Comparison between bridges and underpass also reveals that the underpass usage (62.55%) is far greater than the bridges (3.39%). This result identifies that pedestrians prefer to use underpasses instead of bridges. Besides facility type, other factors that affect the serviceability of pedestrian crossing structure includes the number of lanes and the existence of median barriers.

Keywords: Pedestrian bridges, Underpasses, Serviceability, Pedestrian crossing

Design Modification and Modal Analysis of Lower Labyrinth Seal of Francis Hydro Turbine for Sand Contaminated water: Khan Khwar power station a case study

(Ref No. ICETEMS-21-035)
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Abstract: The repetitive erosion occurs in the hydro power plant under water parts that creates major problems in operation of the plant for maintenance engineers. The researchers try to apply various techniques to minimize the erosion of turbine parts by applying hard coating on the turbine blades and painting. Our research focuses on the critical erosion of turbine lower labyrinth seal of high head projects of WAPDA Khan Khwar power station (KKPS), for contaminated water with sand and mud. In 2015 erosion was observed that leads to failure of underwater parts especial in bottom ring and labyrinth seals due to which the units remain on force outage for longer time and cost a loss of 302 Million to WAPDA. The two possible way to reduce the erosion in underwater parts is the inclusion of sand traps to flush out the sand heavy particle out before entering o the power tunnel which is not possible because of high cost of modification and generation loss. The second option to minimize erosion in high head turbine like KKPS is to modify its lower labyrinth seal due to the free space in between bottom ring and labyrinth seal that allow the sand particle to set in the gape and due to the whirl velocity of the runner the particle moves along the circular periphery and erode the bottom ring and seal that cause break down and water leakage from the cone. The seal is modified in term of geometry and material the hardness of the seal material should be lower than the runner material ASTM 306.The ANSYS15 used to carry out six modal analysis for the same material and modified materials. The comparison shows that the modified material erosion is considerably lower than the original material. The vibration and maximum displacement amplitudes based on modal analysis is lower for the replace material in the lower labyrinth seal. 0.02 gm/hr for modified material and 5.2gm/hr of copper aluminium bronze. The actual life before failure calculated based on same geometry but different materials show that modified material has more serviceable life than original materials (10 months for original material and 9 years for modified material) with the same geometry.

Keywords: Erosion, Hydro Turbine, Francis turbine, labyrinth seal.

Techniques for Finding Moisture Content of the Soil

(*Ref No. ICETEMS-21-045*)
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Abstract: This paper discusses innovative methods for finding the moisture content of soil without compromising its natural integrity. In the field of soil mechanics conventionally a standard method is used which includes drying the soil sample in oven for 24 hours at 110 o C ± 5 oC . Besides this there is another method called Speedy tester method for measuring soil content however its apparatus is expensive and calcium carbide used in it is harmful and flammable. It also fails to give result when the moisture content in the soil sample is more than 20%. There is yet another method in which the sample is dried on a heating source like stove cylinder which has higher chances of denaturing the sample. In this research we have modified this method to minimize the soil damage by indirectly heating soil sample on hot sand which secures the nature of soil against damage. We call this method the indirect heating method. Additionally, we introduce a new technique called the silica gel method. This method extracts the moisture content from sample by using blue silica gel. The silica gel method is quite environment friendly as it avoids fuel consumption; secondly the used silica gel becomes reusable if heated gently. While the standard oven takes 24 hours to give results; the indirect heating method and silica gel method take 30-60 minutes for complete results. Moreover, the indirect heating method gives 98.36% result whereas the silica gel method gives 98.83% result. Thus, the indirect heating method and silica gel method give relatively quick and more efficient results than the standard Oven and Speedy tester methods.

Keywords: Moisture content, Soil mechanics, indirect heating method, Silica gel method, Speedytester

To Study the Effect of Fire Clay as Partial Substitute of Cement and Evaluating Mechanical Properties and Durability via Micro-Structure Analysis

(Ref No. ICETEMS-21-073)
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Abstract: Cement is used as a binder in concrete and is a must for strength and durability of concrete. Cement production is one of the many sources of air pollution which in turn is responsible for climate change. Colossal interest in partial substitute of cement has been observed in this decade to somewhat control the immense production and to bring other sources which are comparatively cheaper and environment friendly. Similar attempt has been made to investigate the effect of pulverized fire clay used as partial substitute of cement. The mechanical properties (compressive, flexure strength) and acid resistance has been analysed where 10% fire clay replaced samples shown higher compressive strength as well as better acid resistance than controlled or plain concrete mixes. Microstructure analysis via SEM (Scanning electron microscopy) and XRD (X-Ray diffraction) help analyse the microstructure the way different products were formed and the compactness of the structure. Test results substantiate the feasibility to develop low cost concrete using Fire clay. It will reduce energy consumption and greenhouse gases produced during the manufacturing process of cement.

Keywords: Cement, Fireclay, microstructure Analysis, SEM, XRD.

Energy Conservation using Conventional Fascia Brickwork of an Educational Building

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Abstract: In the modern era, lifestyles have changed drastically. Our efforts to create comfort in our environment have yielded in huge benefits for the entire human community. But consequently, as we have created more and more sources of comfort, we have also ended up unfolding areas of concern for ourselves. Depletion of natural resources is one noteworthy example of that, to which conservation of resources is the only solution. The project aims to study the energy conserving potential of a building. Fascia brickwork, a form of brickwork that is used for adding to the aesthetics of a building, is added to the exterior walls of the selected building to determine if it is also beneficial in terms of energy consumption. Two models of the building, one with the fascia brickwork and one without the fascia brickwork, are prepared using software. Energy analysis is performed on both the models and the results are compared.

The specific objective of our study is:

- To perform energy analysis for possible adoption of Fascia Brickwork

The overall objective of the project is as follows:

- To encourage energy conservation solutions in construction industry
- To encourage sustainability in construction practices

The following methodology has been adopted:

1. Selection of an Educational Building
2. Modelling of the structure (with and without fascia)
3. Performing Energy Analysis on the models
4. Comparison between the models
5. Presenting the results after comparison

After performing energy analysis on the two models, energy consumption value of 148 $kWh/m^2/yr$ was obtained for the model without fascia and an energy consumption value of 149 $kWh/m^2/yr$ was obtained for the model with fascia applied.

The conclusions drawn from this study are as follows:

- Considering the benchmark of Building Energy Quotient, both the models after analysis show a value that corresponds with unsatisfactory performance range.
- Use of fascia brickwork does not conserve energy.

Keywords: Energy Consumption, Fascia Brickwork, Energy Analysis, Building Energy Quotient

A Review on Game Theory Methods for the Solution Related to Power System Problems

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Abstract Power system deregulation and competition, as well as essential fluctuations in the control and operating structure of these systems, necessitate the development of sophisticated instruments to address these challenges. The game concept method, is described as a logical framework for solving the policymaking method in numerous disciplines, is commonly used among the difficulties of the power system. This article explains how to utilise game theory to address problems in the power system in detail. The basic foundations of game concept methodologies and the main perceptions of game theory will be provided to familiarise readers with the premises of game theory. In addition, fundamental categories of game concept, such as cooperative games, dynamic games, evolutionary game concept, and strategic game concept, will be introduced and briefly defined. In addition, many forms of game theory strategies for solving decision-making problems in the energy system will be investigated. The most important recent contributions in game concept application to the challenge of energy systems have been thoroughly discussed and argued.

Keywords: Game, theory, Game theory methods, Power system

Energy Wastage and Recovery Options in Buildings, using Blower door and Building Information Modelling

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Abstract: It is very important to measure the energy wastage of a building, Reducing the Energy Wastage will ultimately reduce the annual energy usage of a building. Airtightness is one of the necessary parameters that affect the energy consumption of a building. Airtightness is the resistance of the building envelope to infiltration with closed ventilation, which is measured using a blower door, a blower door is a machine that measures Air Tightness of a building. In this study, the effect of airtightness on the overall energy consumption of a building is checked. Two buildings (1 commercial and 1 residential each) were selected in Peshawar region and its Airtightness was measured using Blower Door Machine. The Building Information Models (BIM) of two buildings were used to analyze the peak heating and cooling loads of buildings with measured ACH (Air changes per hour) with standard ACH according to Building Air Tightness requirements. It was concluded that in residential buildings 25 % of cooling and 21 % of heating loads can be reduced by optimizing the leakage. Similarly, in commercial buildings, 15 % of cooling and 30 % of heating loads can be reduced by optimizing the leakage. In the case of the commercial building, 15 % of the heating load was equivalent to 4 tons of Air Conditioning usage.

Keywords: Building Information Model (BIM), Blower Door, Energy Efficiency, Energy Wastage

Development and Validation of Compressive Strength of Marble Powdered Self-Compacting Concrete Containing Rice Husk Ash Using Artificial Neural Network Technique

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Abstract: In recent years, numerous investigations about the impacts of filler and binding materials on the properties of self-compacting concrete (SCC) have been carried out. The disposal of waste material is a big issue in a country like Pakistan where the most important component of the construction field is concrete. The purpose of this study is to develop rheological and hardened properties of SCC by utilizing waste and cementitious materials and to check the feasibility by using Artificial Neural Network (ANN) technique for the prediction of compressive strength of Marble Powder based self-compacting concrete containing RHA. Utilizing certain waste materials in our experimental work, total 22 mixes were prepared using Marble Powder (MP) as sand replacement with ratios of 10% and 20% and rice Husk Ash (RHA) used as cement replacement with ratios 0% to 25%. The ANN model is constructed based on back propagation network technique using Levenberg-Marquardt (LM) Algorithm. The various input parameters of neural network effecting the properties of Self compacting concrete are cement content, water, RHA, Marble Powder, Coarse and Fine Aggregates and Super Plasticizers (SP). The output parameter of ANN is Compressive Strength at specific days. The effectiveness of ANN model is assessed by comparing its predicted values with experimental data. Our Results after comparing with experimental values shows that the ANN Model has overall accuracy of +95% for compressive strength of SCC which shows that this Levenberg-Marquardt based ANN model is found out to be good learning algorithm for this study.

Keywords: Artificial Neural Network (ANN), Levenberg Marquardt (LM) algorithm, Marble Powder (MP), Rice Husk Ash (RHA), Self-Compacting Concrete (SCC).

Experimental Investigation of Bacteria Based Self-Healing Concrete

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Abstract: Cracks of various sizes occur in concrete; these cracks can be micro or macro. If crack size is large, there is a possibility of complete failure of structure. So structure is not able to be used in this condition, but we cannot neglect cracks of smaller size. These smaller size cracks can be changed into larger size cracks with the passage of time, so they need proper filling and repairing on time. Self-healing concrete is the best option to be applied in order to avoid micro-cracks. A specified amount of calcium lactate and bacteria is used in freshly mixed concrete to make it self-healing. Calcium lactate and bacteria react with each other to form calcium carbonate. Whenever micro- cracks occur in hardened concrete, then lime travels into the cracks automatically after a specific time period. The process of healing starts when concrete is exposed to moisture. This Study mainly focused on self-healing mechanism of concrete. Bacteria and calcium lactate were added in concrete mix. Concrete samples were crushed to obtain the required piece for SEM analysis. Initially the SEM analysis was carried out to check the micro cracks produced in the concrete specimen. The specimens were then passed through wet and dry cycle and SEM analysis is carried out after 7, 14 and 28 days of wet and dry cycle. Micro cracks are being replaced by lime produced as a result of chemical reactions between calcium lactate and bacteria. It was observed that the micro cracks are completely healed after passing the specimen through wet and dry cycle for 28 days.

Keywords: Cracks, Bacteria, SEM analysis, Self-healing.

A Review on Grid-Connected Robust Control for Ac/Dc Hybrid Microgrids Based on Mixed Sensitivity

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ABSTRACT: The grid-connected control technology used in the AC/DC hybrid microgrid will affect the power quality, stability, robustness and other indicators. This research provides a robust control method based on hybrid sensitivity for the hybrid AC/DC microgrid connected to the network to achieve the high quality and reliability of the hybrid AC/DC microgrid connected to the distributed network. The model connected to the ac/dc hybrid microgrid network is equivalent to the superposition theorem; then, when considering the influence of the distributed network on the AC/DC hybrid microgrid as a disturbance, the problem of how to control the connection with the network can be transformed into how to deal with the hybrid Sensitivity issues. Secondly, by continuously applying Riccati's method, a robust network connection controller can be constructed to ensure good nominal performance and increase the robustness of the system. Finally, three simulation scenarios can be used to test the effectiveness and feasibility of the proposed control method.

Keywords: Robust Control, AC/DC Hybrid Microgrid, Mixed Sensitivity

Investigation of the Effect of Varying Gradations on the Marshall Properties of Hot Mix Asphalt

(Ref No. ICETEMS-21-110)
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Abstract: Aggregate is one amongst the most important components of hot mix asphalt, contributing ninety to ninety-five percent by weight or eighty to ninety percent by volume. Aggregates thus not solely influence the engineering properties of hot mix asphalt but conjointly its overall performance. Gradation is one amongst the crucial properties of aggregate blend that play a vital role in doing so. This study was carried out to examine the effect of varying gradation blends on the Marshall properties of hot mix asphalt. Along with Attock Refinery Limited sixty-seventy penetration grade bitumen, four completely different gradation blends specifically, Pakistan's National Highway Authority Class-A and Class-B, Superpave and Asphalt Institute were utilized for preparation of hot mix asphalt via Marshal method of mix design. Job mix formula was used to determine optimum binder content at four percent air voids against which all other volumetric and strength parameters were determined. It was concluded that varying proportions of coarse and fine aggregates in a gradation blend had a significant effect on the volumetric and strength properties of hot mix asphalt. The requirement of optimum binder content was lower when the gradation blend was coarser and greater when the gradation blend was finer due to their surface areas. Fine gradation bituminous mixes showed higher values of voids in mineral aggregate, voids filled with asphalt and deformation compared to coarse gradation bituminous mixes. Moreover, better stability was achieved by bituminous mixes which have a strong interlocking of aggregate particles within the gradation blend.

Keywords: Gradation, Marshall Mix Design, Hot Mix Asphalt, Marshall Parameters

Mathematical Modelling and Analysis of Harmonic Filter to Reduce Total Harmonic Distortion due to Nonlinear Load

(*Ref No. ICETEMS-21-113*)

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Abstract: With the advancement in technology, power electronics has become a vital part of the power sector. Almost every electrical device is now based on power electronics due to its tremendous advantages. But their major drawback is normally overlooked i.e. these devices offer some major power quality issues and effects the supply side of power system. Among these power quality issues, harmonics are the most crucial ones caused mainly due to the nonlinear load and need urgent mitigation. This research is conducted to overcome this issue i.e. to reduce total harmonic distortion (caused due to nonlinear load). This research mainly comprises of mathematical modelling and simulation of shunt active power filter to reduce total harmonic distortion and to improve power quality. In this research, an application of mathematics is being adopted in the field of electrical engineering, shunt active power filter is designed based on a synchronous reference frame (SRF-Theory) and the harmonic analysis was conducted with the help of Fourier and Fast Fourier transform that reduced the total harmonic distortion up to 3.81% in accordance with the standard harmonic limit provided by IEEE-519 standard that allows 5% total harmonic distortion. Finally, the proposed research established the highly improved total harmonic distortion, reduced the stress on supply side, lower the losses and has improved the power quality.

Keywords: Harmonics, Active filter, FFT, THD, Power Quality.

Copper and Iron Losses Minimization of Hybrid Excited Switched Flux Partitioned Stator Machine

(*Ref No. ICETEMS-21-117*)
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Abstract: Copper Losses is one of the major limiting factors in machine design. The existing Hybrid Excited Switched Flux Partitioned Stator Machine (HE-SFPSM) have low torque and power due to high copper and iron losses. The main objective of this thesis is to reduce the copper and iron losses of the HE-SFPSM for maximum torque and maximum power. For the minimization of copper and iron losses in the proposed model Hybrid Excited Switch Flux Portioned Stator Machine (HE-SFPSM), we have replaced the toroidal winding by concentrated winding and also changed the number of slots and number poles. As compared to conventional HE-PSSFM, the proposed 6-slots/6-poles HE-SFPSM has a 24% less copper losses, at same armature and field current densities of 15 A/mm2 Compare to conventional HE-PSSFM. According to the simulation results, the proposed 6-slts/6-poles HE-SFPSM average torque is have 35% greater than conventional HE-PSSFM. Moreover, the examination of different parameters such as flux regulation, flux correlation, cogging torque, electromagnetic back emf and torque ripple torque are examined with the help of 2D- finite element analysis (FEA).

Keywords: flux linkage, Copper Losses, Cogging torque, output torque, instantaneous torque

Catalytic Conversion of Used Cooking Oil (UCO) into High-Grade Chemicals

(Ref No. ICETEMS-21-123)
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Abstract: The development of renewable energy sources will decrease our dependency on the usage of fossil fuels; in addition safeguard the green environment from the harmful effects of the produced greenhouse gases.In this study we investigated the catalytic conversion of used cooking oil (UCO) with the objective to examine the proposed metal oxide catalysts (CaO, TiO_2, CaO/TiO_2 (hybrid)) characterizations and yield of produced products (high grade chemicals). It also aims to compare the performance of the metal oxide catalysts and to find the optimum process conditions. The catalysts were characterized before and after the use by X-ray diffraction (XRD) and X-ray fluorescence (XRF) and the produced products were evaluated by gas chromatography mass-spectrometry (GC-MS). The reaction parameters; heat rate, reaction temperature, reaction time, catalyst load) effects were also investigated for the selectivity of the products. The experimental results showed that 4 wt. % catalyst, 10 °C /min heat rate, 500°C reaction temperature, and 120 m reaction time give best result for hybrid ($CaO-TiO_2$) catalyst, The obtained maximum biofuel yield was 63%, 68% and 79% for TiO_2, CaO and CaO/TiO_2, respectively. It was also observed that the hybrid catalyst showed better activity on repeated recycle turns illustrating that it is a potential choice for the conversion of UCO into high grade chemicals.

Keywords: Used Cooking Oil, Metal Oxide Catalysts, Catalytic Cracking, Biofuel.

Selection of Suitable City and Its Optimized Location for the Installation of Grid Connected PV System

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Abstract: Electrical energy provided by existing hydro and thermal power plants is being limited as the population and industrialization of metropolitan regions has increased, resulting in high energy costs and energy instability. As a result, the global spread of Photovoltaic (PV) based micro-grids have increased while taking use of free solar insulation throughout the day. However, weather circumstances have a significant impact on its fluctuation and unpredictability. This work aims to find suitable city and its optimized location for the installation of Grid connected PV system in Pakistan. The weather data collected from different cities of Pakistan are used to calculate average irradiance of sun, maximum temperature and minimum temperature. Based on collected data, the suitable city for the installation of Grid connected PV system is selected through the Simulink model. After the selection of suitable city for the installation of micro-grid, the GIS (Geographical information system) is used to find out the area of that specific city in which maximum PV energy will be obtained.

Keywords: Photovoltaic system, micro-grid, optimum location, PV-grid system.

Bibliometric analysis of nanofluid based enhanced oil recovery: Identifying current trends, gaps and future areas for multidisciplinary research

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Abstract: Enhanced oil recovery (EOR) solutions are being seen as the way ahead in modern times to get the most out of existing producing areas, while most contributing oil fields are in decline while new expansions are scarce. The advent of nanotechnology has opened a whole new world of nanofluids as an EOR approach. Although nanofluid-EOR techniques have yielded promising results in the lab, the oil and gas sector has been unable to utilize them due to a variety of technical, economic, and environmental issues. Stability of nanofluids, pore scale modelling of fluids, optimization studies for optimized parameters, and economical evaluation of environmentally acceptable nanomaterials are all critical areas that require an interdisciplinary approach. This study has been carried out to evaluate research potential, gaps, and way forward in nanofluid application as EOR technique by bibliometric analysis of the research trends. This research makes use of VOSviewer software, a bibliographic analysis tool that maps published research based on co-authorship and keyword co-occurrence centered on citations and number of publications with respect to the year it also outlines top article-producing countries and institutes, as well as key authors and nanofluid research fields under consideration. This research utilized Scopus data, to find top cited keywords associated with recent publications and citations. Stability, wettability change, interfacial tensions, particle sizes, and other keywords were lately in the spotlight, based on citations and publications. As a result, it can be stated that, to meet future energy demands, research in nanofluid-EOR techniques requires a multidisciplinary approach as well as research partnerships that span institutional and national boundaries. As research trends reveal challenges relating to stability, optimization, cost-effective manufacture, and environmental acceptability of nanomaterials employed, successful application of nanofluids also necessitates a multidisciplinary approach.

Keywords: Nanofluid, EOR, Enhanced Oil Recovery, Wettability, VOS viewer

Facile functionalization of green nanomaterial in sustainable environment

(*Ref No. ICETEMS-21-149*)
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Abstract: Micro fibre alumina was synthesized using thermal urea precipitation technique and applied as support for the nano-sized ZnO precursor. The facile functionalization of nano sized ZnO in reactive adsorption desulfurization (RADS) performance and effect of diffusion rate in the desulfurization process were compared with commercially prepared alumina used as support for ZnO and Ni precursors. Higher breakthrough desulfurization activity and sulfur adsorption capacity were concluded that strongly depends on the diffusion rate of molecules, homogenous nano-sized ZnO dispersion and degree of active oxides interaction with support. Results show that Ni/ZnO-Al$_2$O$_3$-fibre adsorbent achieved highest breakthrough sulfur removal (10 ppm) up to 31.2 mL and 94 mg S/g sulfur adsorption capacity. Where Ni/ZnO-Al$_2$O$_3$-Com reveals compromised desulfurization performance of 1741 ppm dealing with 31.2 mL of model fuel, which is responsible for 39 mg S/g accumulative sulfur capacity. Detailed characterization results conclude that higher external diffusion of reactant molecules within the cress crass micro-fibre, nano-sized ZnO particles and their lower irreversible oxides interactions (IOI) may be the reasons for superior RADS performance of Ni/ZnO-Al$_2$O$_3$-fibre adsorbent.

Keywords: Environmental pollution, nanomaterial, desulfurization, micro fibre, catalysis

Biological fuel cell as green alternative approach for Sustainable Bioenergy Production

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Abstract: Development of new alternative energy sources has grabbed a great interest in the modern era to sustain future world stability. The most important property of alternative energy source is their environmental compatibility. The Microbial fuel cell (MFC) as new breakthrough and green alternative energy sector for power generation, based on the renewable strategic approach and does not have any harmful impact on the environment. Thus, in new era of science MFCs have a great potential to generate energy by switching of chemical energy present in waste material into Bioenergy. The main objective this research work to used single and double chamber mediator-less microbial fuel cell to convert the chemical energy into electrical energy. The wastewater sample was subjected to aerobic fermentation in a single and double chamber BFC for 7 days by using yogurt. The physical parameters such as pH, conductance, current density, voltage, power output and resistance were monitored for a week to observe changes due to metabolic activities of microorganisms. The high current density (39.20 mA) was found in the parallel combination of single chamber open system BFC using eight electrodes each of zinc and copper. On the other hand, the high voltage (4.10 V) was found for the series combination of double chamber open system BFC using continuous-circuit bridge and two electrodes each of zinc and copper. These results concluded that the fermentation of domestic wastewater result in a valuable increased in electrical energy.

Keywords: Biological fuel cells, single and double chamber, Bioenergy, wastewater

Modeling of DC to DC Converter Using Interleaved Topology with Voltage Multiplier Cell for High Voltage Gain Ratio

(*Ref No. ICETEMS-21-200*)

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Abstract: Dc-dc boost converter is very popular topic from the last two decades due to the world needs energy sources with lack of pollution and bad effectives to the environment. In order to accomplish a high pushing force (voltage) from solar energy, many researchers designed various types of topologies in dc-dc converters with the purpose to attain high voltage gain ratio and efficiency. But still in the current topologies have some problems, such as low efficiency, voltage ripples, and reducing the voltage stress and input current. To overcome this issue we will design a novel topology by using interleaved topology with multiplier cells. The central idea of our approach is achieving high efficiency, low power dissipation and reducing voltage stress. This paper would like to make a clear picture on the general law and framework for the next generation non-isolated high step-up DC/DC converters.

Keywords: High Voltage Gain, DC-DC Converter, Renewable Energy, Voltage Stress, Coupled Inductors, Interleaved, Multiplier Cell, IBMC.

Arduino Based Improved Smart Solar PV System with Dual Axis Monitoring and Cleaning System

(Ref No. ICETEMS-21-163)
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Abstract: Electricity is generated by several sources. Sun is the primary and ultimate renewable resource of energy in the universe. The sun light can be easily converted into electricity through PV Panel. The stationary PV panel works efficiently for a specific time due to the earth's rotation. To get more energy, the panel must be pointed perpendicular to the sun all over the day. This paper presents a PV system which is smart and will increase the output power by keeping solar panel perpendicular to the sun all the time. This system is based on Arduino that controls majority of the components automatically using sensors. The whole system is a combination of hardware and software. The main constituents of system's hardware are a PV module, an LDR module, two geared motors, a temperature-sensor, a rain-sensor, a dust sensor and a cleaning system. The methodology employed in this system includes the implementation of Arduino based solar tracking system. Four LDR sensors detect the light and give signals to the controller and rotate the motor. Geared motors have been used to rotate the solar panel both horizontally and vertically according to the sun light. The system will be operated automatically as well as manually. All the values will be displayed on LCD. The dust sensor will detect the dust which will trigger the cleaning system. The system information will be shared with mobile user through IOT. The sensors and motors will enable us to make more efficient and smart solar powered automated system which will allow us to draw more renewable energy than typical systems.

Keywords: LDR, PV Module, IOT, Automated Tracking, Cleaning Module

Ground-water Replenishment using Rainfall Harvesting Technique; A case study of Phase-VI Hayatabad, Peshawar, Pakistan

(Ref No. ICETEMS-21-164)
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Abstract: Groundwater is a valuable resource on this planet, People living in urban areas mostly use groundwater for their survival. This excessive sustained groundwater pumping results in alarming depletion in groundwater levels. The increase in population and urbanization are the major causes of the decreasing rate of groundwater replenishment. The surface water on the other hand becomes inaccessible and polluted due to human activities. The ground-water level is rapidly depleted under the increasing rate of urbanization and abstraction of groundwater in Peshawar, Pakistan. In order to decrease pressure on the municipal water system, Rainfall harvesting method (RHW) is applied for 3 Marla roofs (816.752 ft2) have stored 780-liter water in 27.6 ft3 tanks on 5th August-2021 and 1547 liter on 8th August-2021. The RHW method is applied for the selected area having 1069781m2 (26.41 %) covered area/roof-top area can store 19531 m3/day water .while the supply of municipal water from 19 tube-wells is 15255.20 m3/day and the demand is 20978.3 m3/day. If the dwellers are convinced to install the designed volume storage tanks in their vicinity and use that water for all the activities other than drinking can save 30-40 % ground-water abstraction.

Keywords: Groundwater Replenishment, Rainfall Harvesting Method.

Impact of land-use changes on the design of irrigation channel: A case study of Joe-Sheikh canal in Peshawar, Pakistan

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Abstract: Considerable changes have been observed in the land use of Peshawar district, Pakistan over the years. These changes, in addition, due to the absence of land use demarcation by relevant provincial and district councils, are also a direct result of increased population and immigration of people from other districts of Khyber Pakhtunkhwa, Pakistan. One of the remarkable changes is in agriculture and urban land use. The areas previously used for agricultural produce are now increasingly converted to build-up urban areas. This paper presents the quantification of land-use change in the Pakha-Ghulam area of Peshawar district. More emphasis is put on changes required in the design of the joe-Sheikh canal that originally was designed for larger agricultural areas. Field measurements are made and local people in the vicinity are contacted for land-use changes that have affected their live hood. The proposed design is believed to serve the areas well as compared to the original canal design.

Keywords: Canal Design, Land-use.

Design and Fabrication of an Intelligent Cardiopulmonary Resuscitation Device

(Ref No. ICETEMS-21-169)
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Abstract: Cardiac arrest is common all over the world. Cardiac arrest is a state of health where the heart suddenly stops beating and as a result of the blood flow decrease to the brain and other parts of the body. The first step for the patient's treatment who has experienced cardiac arrest is to provide cardiopulmonary resuscitation (CPR). While the compression rate and fixed force providing constantly for CPR mechanisms are far behind the human capability and also person gets exhausted and tired from doing such a thing for a long time. So, there is an intense need for an automatic mechanical device that provides CPR according to the American Heart Association (AHA) or any other standard guidelines, the device made for CPR is called a CPR device. This device increases blood flow to the brain and other parts of the body. As a result, the chances of a patient's survival have been increased. As the lower sternum is compressed, the intrathoracic pressure is increased and during the relaxation phase, the blood flows in the body and reached different parts of the body. The device provides 80-120 compression per minute with a ratio of 30:2. It means that the device provides 30 compressions and then automatic stop for two (2) ventilation and the cycle repeat itself continuously with a depth of 1.5-2 inches depending upon the patient's age. To meet the American Heart Association standard guidelines, a program has been set for the Arduino controller to provide such a condition and fulfill the requirement.

Keywords: Cardiopulmonary Resuscitation, Active Compression Decompression, Fuzzy Inference System, intra cranial pressure

Post CPEC Infrastructure Requirements of Peshawar
A Case Study on Residential Areas

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Abstract: Pakistan is facing housing unit's problem for more than 70 years. A number of housing schemes were launched to overcome the issue but it was difficult to fulfil the demand of housing units for increasing population, mainly because of two reasons: Low income generation of common people, No initiatives from government of Pakistan for facilitating economic capacity tools & structure available to common people. In 2015 China Pakistan Economic Corridor (CPEC) was initiated and Economic zones were also developed near Peshawar district (defined as node city of CPEC). Increase in population is expected in the future due to Industrialization, Trade, Economic activity, and Employment in the node cities of CPEC. This research addresses the problem of housing units in Peshawar district and provides guidelines for modern designed cities. The major residential areas of Peshawar are deigned which can only fulfil the demands of natural population growth. To address the requirements of residential units in Peshawar the study was focused on the future demands of residential units in Peshawar with natural and CPEC related growth of Population. A Future increase in population was forecasted and a survey of the Peshawar region was carried out to identify feasible locations for new residential projects and major residential areas. Remotely sensed data were used for geographical & statistical analysis of feasible sites. Geo-Spatial planning techniques GIS & Computer Aided design software was used to design the residential areas for forecasted population according to the guidelines of Nation reference manual on Planning & Infrastructure (NRM).

Keywords: CPEC, Economic zones, Housing units, Population, NRM

Modeling of DC to DC Converter Using Interleaved Topology with Voltage Multiplier Cell for High Voltage Gain Ratio

(Ref No. ICETEMS-21-199)

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Abstract

Dc-dc boost converter is very popular topic from the last two decades due to the world needs energy sources with lack of pollution and bad effectives to the environment. In order to accomplish a high pushing force (voltage) from solar energy, many researchers designed various types of topologies in dc-dc converters with the purpose to attain high voltage gain ratio and efficiency. But still in the current topologies have some problems, such as low efficiency, voltage ripples, and reducing the voltage stress and input current. To overcome this issue, we will design a novel topology by using interleaved topology with multiplier cells. The central idea of our approach is achieving high efficiency, low power dissipation and reducing voltage stress. This paper would like to make a clear picture on the general law and framework for the next generation non-isolated high step-up DC/DC converters.

Keywords: High Voltage Gain, DC-DC Converter, Renewable Energy, Voltage Stress, Coupled Inductors, Interleaved, Multiplier Cell, IBMC.

Mechanical Properties of Adobe Air-Dried Bricks Assemblages Stabilized with Cow-Dung and Cement

(Ref No. ICETEMS-21-033)

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Abstract

Adobe is one of the earliest building materials which is used for bricks and the construction of low-cost housing. Adobe bricks are vulnerable to loads that result in degradation over time when used in construction. These bricks need to be durable enough to withstand the loads and degradation over the life of the structure it is used in. This study aims to identify the problems that need consideration in construction with adobe air-dried bricks. The soil samples for this study were collected from different sites of Peshawar and analyzed in the laboratory to find out different physical properties before it is used in the bricks. Different proportions of soil, cow dung, cement, and lime (17% and 20% cow-dung, 10%, and 15% lime, 10%, and 15% cement) were used in the construction of the adobe bricks. The assemblages were constructed with the selected proportion (Soil + 20% cow dung +15% cement) to study different mechanical properties of adobe air-dried bricks assemblages. Standard tests according to ASTM (Diagonal compression & prism compressive strength) were performed on the prepared samples. The diagonal compression test on a 2ft x 2ft sample resulted in shear stress of 3.4 psi and a shear strain of 0.05 mm/mm. The masonry prism test was performed on 3 units high prism that resulted in 80 psi masonry prism strength and 79.26 psi compressive strength of masonry. To make the masonry withstand the ground motions (earthquakes) and other forces such as surface erosion different techniques were studied, and recommendations are given based on that.

Keywords

Mechanical Properties, Adobe Bricks, Stabilizers, Cow Dung, Assemblages.

Quantitative Analysis of the Effects of Obstructing Direct Line of Sight Communication in 5 GHz Band Using Metal Sheet

(*Ref No. ICETEMS-21-036*)
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Abstract: The study is related to the investigation and quantification of the effects of the obstructing materials in the first Fresnel zone of Wi-Fi/WLAN network signals operating in the 5 GHz Band. The Obstruction caused reflection, refraction, diffraction, absorption, and scattering of the signal. The metal obstructions have existed of different gauges and materials in the path of signal propagation. However, some work on the effects of obstruction on wireless signal propagation has already been done. Particularly this research work emphasizes on finding quantitatively the influence of metal sheet of iron obstruction on the signal propagation. The experimental scenario has a Wifi router that transmits the signals and a receiver (laptop) that received the signals and a metal obstruction, blocking the signal propagation. The transmitter-receiver distance is kept at 16m, to fully obstruct the first Fresnel zone by using a circular obstacle made of iron. The metal sheet is placed at the center of the path. The scenarios investigated include the direct line of sight and obstructed line of sight in both indoor and outdoor environments. The same experimental scenario was used and perform the experiment in a virtual environment by TamoGraph software. The results of the indoor and outdoor were compared of the similar experimental setup. The value of signal strength in the outdoor environment was observed to be less than in the indoor environment. This was probably due to the scattering of signals outdoor while multipath convergence in an indoor scenario. The data of TamoGraph software is compared with the practical experiment. The result of the virtual experiment followed the result of the practical experiment but was slightly different due to the difference between the practical and virtual environment. It can be concluded from this research that the signal strength is more effected when the obstacle like metals are present in the first Fresnel zone, so it is necessary to keep the first Fresnel zone free of obstacles. The results have been calculated by placing the iron obstruction between the transmitter and receiver between the LoS path. This can be applied in an indoor environment with higher propagation indoor environment and can avoid unwanted signals by the placement of iron obstruction.

Keywords: Fresnel zone, Wi-Fi WLAN obstruction, NLoS, Metal Shielding ISM Band 5 GHz.

Design and Control of Novel Boost Converter Topology for Renewable Application

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Abstract: In this paper proposed the novel topology of boost converter for renewable Applications. It has a low and in-consistent output voltage such as photovoltaic (PV) module and fuel cell. As we know PV modules have very low output voltage, every single cell of PV module produces 0.5 to 0.6 volts. So, the 36 cell PV module produce 18 to 22-volt means produce 150 watts, and the 60 cells PV module also produce rated voltage between 30 to 36 volts means 250 to 300 watts as maximum voltage of 72 cell panel. The standard voltage AC is 110V and 220V which is 1.414 times the AC voltage. The Direct Current Side Pressure is high when converting DC to AC. But we know PV module output voltage is very low, also the PV module output is totally dependent on irradiance means as the irradiance is increased the productivity of power is increased and when the irradiance is decreased the output power is decreased, to maintain its constant output PI controller is used. The reason behind using a PI controller to provide fast control and remove the delay. In PI controller the output voltage subtracts from input reference voltage and then use gain after the gain the PI controller is used the controller output is given to the comparator to compare the controller output and the ramp signal when the reference signal is greater than 1 it generates on and vice versa. So, to improve the output power of PV used proposed converter with interleaved structure it consists of source, two number of metal-oxide-semiconductor field-effect transistors (MOSFET) for switching through controller, two number of inductors in each phase, three number of capacitors, two number of diodes and the load. The PWM signal of M2 is delayed from M1 by 180o.The simulation has been taken in MATLAB SIMULINK on 80 percent duty cycle value and then compare the result with conventional boost converter on the same duty cycle. Steady state analysis and operating principals are examined in the paper. It clearly shows that the output gain is high and stress across the M1 and M2 is also decreased. Also, the output voltage of PV is constant using a controller. The simulation has been conducted to verify the conventional and interwove boost converter. The objectives of the paper are to raise the voltage-gain, decrease the stress voltage of the semiconductor and to constant the output voltage.

Keywords: MOSFET, MATLAB SIMULINK, Photovoltaic, Cell panel

Performance Investigation of Wound Field Flux Switching Motor

(Ref No. ICETEMS-21-098)

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Abstract

Wound field flux switching motor are required where the reliability and fault tolerance. The fault tolerance is very important for Flux switching machines (FSMs). They can be categorized into three groups that are Permanent magnet (PM) FSM, field excitation (FE) FSM and hybrid excitation (HE) FSM. Among these FSMs, the PMFSM offers advantages of low cost, simple construction and other capabilities suitable for various performances. In this paper investigate the performance of wound field flux switching motor with a topology of 12-slot and 11pole configuration. In this topology all the active parts are located on the stator while the rotor is free from winding. The performance of the proposed motor on the initial design and improved design are analyzed based on 2-D Finite element analysis (FEA). The performance of the improvement design shows that the maximum torque is obtained 2.5761 Nm. The previous knowledge of behavior of machine under different fault conditions. The basis of evaluation of the effects of faults on the machine. The main parameters of the machine whose transient behaviors must be studied under fault conditions are voltage, current and torque. Phase open circuit, phase short circuit, phase ground, faults are simulated using JMAG (FEA) tool.

Keywords: Flux switching machines**,** Hybrid excitation, Permanent magnet, Field excitation, FEA

Performance Investigation of Hybrid Excited Flux Reversal Machine

(*Ref No. ICETEMS-21-114*)

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Abstract: The FRM comes under the heading of stator interior permanent magnet machine. The chief advantages of FRM is related to the absence of electrical conductors are constant magnets on the revolving rotor. Flux Reversal machines (FRMs) that consist of all flux sources in the stator have been developed in recent years. They can be categorized into three groups that are Permanent magnet (PM) FRM, field excitation (FE) FRM and hybrid excitation (HE) FRM. Among these FSMs, the PMFRM offers advantages of low cost, simple construction and other capabilities suitable for various performances. In this paper is design study of outer-rotor field-excitation flux switching motor (FEFSM) with a topology of 6-slot and 34-pole configuration (6S-35P) with all active parts are located on the stator for electric vehicle application as a low-cost of non-Permanent Magnet (PM) machine. The performance of the proposed motor on the initial design and improved design are analyzed based on 2-D Finite element analysis (FEA). Which is greater than the initial design that obtained 2.17Nm using JMAG (FEA) tool.

Keywords: Hybrid excitation, Permanent magnet, Flux switching motor, finite element analysis

Design and Implementation of Railway Track Safety System

(Ref No. ICETEMS-21-115)
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Abstract: Railway is one of the most significant transportation mode of our country but it is a matter of great sorrow that, railway tracks of our country are very prone. That's why, a huge number of accidents are occurred every year due to this primitive type of rail tracks and as the consequences of those accidents we lose huge number of lives every year. Because the manual inspection of the railway system is impossible and impractical. Hence to avoid the accidents and improve the quality of railway transport we are proposing an automatic inspection system. The proposed system will identify the obstacle on track by using sonar sensor if sonar sensor finds something on track then the nodemcu ESP8266 will inform us by the thingspeak website at thingspeak we will check our data in the form of graph as will as there is one another sensor that is fixed on train it will watching for obstacle if there is any obstacle detected then it will automatically stop the train and also provide crossing levels automatic close and open by using FSR sensors. The system works on a microcontroller based system. It receives the input signal from the two FSR sensors and sends information to the gate motor driver for opening and closing of the gate. The arrival and leaving of the system is monitored and the gate is operated accordingly. When the FSR one change its resistance then it will give a signal to Arduino the Arduino will give a command to servo motor to close the gate similarly when FSR two change its resistance due to force of train then again it give a signal to Arduino the Arduino will give command to servo motor to open the gates. Railways are large infrastructures and are the prime mode of transportation in many countries. The railways have become a prime means of transportation owing to their capacity, speed, and reliability. Even a small improvement in performance of railways has significant economic benefits to rail industry. Thus, a proper maintenance strategy is required to govern optimization of inspection frequency and/or improvement in skill and efficiency. Accidents happening due to track breaking have been a big problem for railways for life security and timely management of services. This breakage needs to be identified in real time before a train actually comes near to the broken track and get subjected to an accident. In this paper, different kinds of rail defects inspection and maintenance methods are described and a basic algorithm is readdressed that makes use of wireless acoustic sensors for detecting cracks and breakages in the railway tracks. The concept of fuzzy logic is used by author's deployed sensors. A model for placing sensors on the railway track is described in the system. There are many base stations or control centers which collect the data from the numerous sensor nodes distributed on the railway tracks. Multi-layer routing is used to transmit the sensed data to control station. The sensor nodes transmit the data to their nearby cluster heads. Multi-layer routing is used; the nodes in lower layer transmit their data to higher layer instead of transmitting it directly to base station as will there an another sensor installed on train when it senses obstacle then it will directly give command to train to stop engine.

Keywords: ESP8266, Fuzzy logic, Multi-layer routing, FSR.

Comparative Analysis of Cross-Laminated Timber and Reinforced Concrete Structures

(Ref No. ICETEMS-21-022)

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Abstract: With the advent of the latest technologies, newer building materials are being produced and utilized that are substantially more energy-efficient, less costly, and environment friendly. In comparison to traditional constructional materials such as RC, bricks, steel, and timber, CLT is now being considered to possess more advantages in terms of energy efficiency, carbon emissions, and structural performance. This study will help bridge the gap in research on the comparative analysis of different engineering properties, environmental, economic, and social impacts of RC and CLT in the Pakistani construction industry. We carried out a closed-ended questionnaire-based survey and analyzed multiple statistical tests such as normality tests, T-test, Chi-square, and Harman's single factor test using SPSS software. As per the non-missing sample size, the responses were more positively inclined towards RC in terms of engineering properties, economic, and social impacts considering the overall material strength, cost, availability, social practices, and norms of the Pakistani construction industry. The responses were also positively inclined towards CLT in terms of environmental impacts. The preferable choice of building materials in Pakistan is RC, but the shift towards CLT is still a long way to go. The research area needs further in-depth analysis to comprehend the characteristics, performance, cost, and viability of RC and CLT for adopting the evidence-based practice to make an informed and sustainable choice of building materials.

Keywords: Energy-efficient, Structural Performance, Closed-ended Questionnaire, Statistical Tests, Sustainable

ENGLISH & APPLIED LINGUISTICS

A Corpus-based Study of Content Words for Forensic Analysis

(Ref No. ICETEMS-21-116)
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Abstract: The objective of this study is to identify the link between the use of content words in the speech of serial killer and Police officer in the Netflix Original Series "Mindhunter". The study analyses the use of verbs, adverbs, adjectives and nouns to achieve the objective of the study. It is a corpus-based study where the objective is to identify similarities or differences between the uses of content words. The research is based on quantitative corpus analysis technique using a conceptual framework. The research reported almost equal use of verbs, adverbs, adjectives and nouns with at least 1% difference. The data is collected from Netflix original TV show 'Mindhunter'. The analysis shows the use of terminologies as inconclusive with a 1% difference in noun, verb, adverb and adjective. The study also concludes that quantitative corpus-based analysis in forensics for determining a serial killer may not be a viable option. Therefore, qualitative analysis is a better option in identifying serial killers through their choice of words in speech. The significance of the study is to identify any links between the speech of serial killers to help forensic analysts in the future to determine guilty individuals. Serial killers are notorious, cleaver and tricky individuals. They are not normal criminals, and as a result, cannot be caught by normal method of investigation. Therefore, qualitative analysis of their speech may prove beneficial in their investigation.

Keywords: Forensics, Corpus Linguistics, Content Words, Qualitative Analysis,

The Role of Social Factors in Women's Use of Emojis

(Ref No. ICETEMS-21-077)
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Abstract: Emojis are the non-verbal cues and graphical characters used to convey feelings, express emotions, deliver intentions, observe polite sarcasm, create fun and humor, and communicate the implicit meanings of the texts in digital communication. Due to its pictorial nature and graphical representation, the language of emoji has become a universal language. The objective of this study is to determine the impact of social factors (such as participant, function, and topic) on the use of emojis by females in their conversation. Data from a sample of 62 females selected through convenience sampling technique is gathered till saturation point. A survey research design is adopted and data was collected through a self-administered questionnaire. The questionnaires were distributed through Google Form. The data were analyzed using descriptive statistics. The results show that girls frequently use emojis in close social relations including best friends, siblings, and spouses; however, the formality and gender of their participants are the significant factors in changing the use of women's emojis. Girls prefer to use emojis with the same gendered participants as compared to opposite gendered participants. Additionally, they frequently use emojis with the participants with whom they are frank as compared to participants with whom they are formal. Similarly, the topic of conversation also changes the use of women's emojis. They frequently use emojis in normal chitchat and trivial topics. They frequently use emojis while discussing their problems as compared to other serious discussions. The highly affective and highly referential functions lead them to frequently use emojis. The study concludes that social factors have a significant role in women's use of emojis.

Keywords: Emojis, Women's Use of Emojis, Social Dimensions, Accommodation Theory

Typology of Swear Words in the Movies "Gangs of Wasseypur" Part I and II: A Semantic Analysis

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Abstract: Swear words are integral part of informal use of language both in written and oral communication. People learn swear words from everyday conversations, movies and other platforms of social media. This study aims to identify the types of swear words used in the movies "Gangs of Wasseypur" part I and II through semantic analysis. The study uses Jay's (2009) semantics-based typology of swearwords as a framework. The script of the movies is taken from the official website for the analysis. The analysis reveals that the characters in the movies use eight types of semantic referents of swear words out of nine, which include animal names, psychological-physical-social deviations, offensive slang, substandard vulgar terms, sexual references, scatological and disgusting objects, profane or blasphemous and ancestral allusion. Moreover, 'ethnic-racial-gender slur' type of swear words are not used in the movies. The study concludes that a wide range of swear words are used in the movies except the use of racial, ethnic and gender related swear words. This ascertains that due to the wide range of audience, the choice of swear words are restricted to the other types in order to avoid offending the audience.

Keywords: Swear Words, Jay's Typology of Swear Words, Media Discourse, Offensive Language

Linguistic Analysis of Top Trending Social Media Neologistic Phrases in Pakistan

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Abstract: Neologism is a phenomenon which develops new words, new sense of words and phrases in language. This study aims at understanding the process of lexical and semantic change in the selected neologistic phrases of social media in Pakistan. It is a qualitative study which uses discourse analysis technique for the analysis of top trending neologistic phrases in Pakistan. The data is collected from the trending tweets of Twitter and Google through simple random sampling technique. The theoretical framework of "Neologism" is used to explore the creation of trending neologistic phrases on social media in Pakistan. Analysis shows that neologistic phrases bring semantic and lexical change in the phrases through the use of social media. The process which is involved in making the phrases neologistic phrases are creation, trial and establishment. Neologistic phrases like 'pawri horahi hai', 'quarantine and chill', 'the tea is fantastic', 'naya Pakistan' and 'gora complex' show the process of neologism through lexical or semantic change in the language. The study concludes that the neologistic phrases bring changes in the language through the use of social media. This study is significant as it highlights the role of social media in lexical and semantic change in the language. The study also highlights the linguistic change and adoption of newly coined phrases in Pakistan.

Keywords: Neologism, Top Trending Social Phrases, Neologistic Phrases, Social Media.

Patriarchal Hegemony in the Short Stories of Kate Chopin

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Abstract: This study aims to identify the features of patriarchy in the selected short stories of Kate Chopin. The theoretical framework of C. J. Nash (2009) is used to explore the patriarchal aspect of the selected short stories. The short stories were selected through the purposive sampling technique using content analysis. The stories are "Desiree's Baby, The Story of an Hour, The Storm and The Night in Acadie." The analysis shows that there are aspects of racism; the positive features of race associated with males are highlighted whereas, negative features of the race of females are repeated by the male characters in the short stories. Moreover, another aspect that is evident in the stories is women's oppression and the exclusion of women from every discourse by the patriarchal forces. Furthermore, only men have the right to accuse women of every wrongdoing and infidelities. Additionally, the right to continue or leaving a relationship is only confined to the men of the society. The study concludes the presence of patriarchal features in the short stories of Kate Chopin. The study is significant because it portrays all those features of patriarchy present in contemporary society.

Keywords: Patriarchy, Kate Chopin, Short Stories, Women Oppression, Racism

Covid-19 and War Metaphor; A Linguistic Projection through Pakistani Advertisements

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Abstract: This paper analyses the war metaphor used in selected Pakistani advertisements about Covid-19 pandemic. The research particularly explores the working of conceptual *war* metaphor through Conceptual Blending theory (Fauconnier 1997, Fauconnier and Turner 1996, Turner and Fauconnier 1999, 2000). The paper discusses the cognitive mapping for the Covid metaphors through linguistic analysis which results in a psychological effect of war narrative on the audience. The war narrative thus leads to produce effect of fear and dread; the audience resultantly finds safety in following the Covid SOPs by consuming the advertised product. This study is a qualitative analysis of *war* metaphor used in selected Pakistani advertisements of soaps, detergents, sanitizers etc. The significance of this research is to correlate the importance of metaphor used in advertisements to magnify the fear of Covid pandemic through language manipulation. As language becomes psychological affair through metaphors; it heightens the effect on the audience which in turn leads to active positive response from them. The response is not only in submission to follow the message of the advertisement but also in readily consumption of the advertised product against the dangers and challenges posed by Covid-19.

Key words: Covid-19, War metaphor, Blending Theory, Advertisement Language

Cultural Displacement: A Postcolonial Crtique of Chnages's In Hamid's The Reluctant Fundamentalist

(Ref No. ICETEMS-21-188)
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Abstract: The study aims to decipher Hamid's portrayal of Changez from 'The Reluctant Fundamentalist' in the light of postcolonial theory. The study traces the journey of Changez Khan, a juvenile adult coming from the fundamentalist Pakistan, into the progressive multi-ethnic and multi-cultural society of America. The present study aims to analyse the social conditions of Muslims in America after the attacks of 9/11. Furthermore, the study aims to unearth the ambiguities around the character of Changez Khan who faces the problem of cultural displacement. The study uses textual analysis as its technique and Edward Said's concept of cultural displacement as its standpoint. The Orients lose their identity when they start living with Occidents in their respective societies. Changez khan, an Orient from the East faces the same problem of identity crises in America falling prey to the phenomena of cultural displacement resulting in his rebellion and insolence. Hamid tries to portray his dilemma of 'Cultural Displacement' to highlight the struggle of postcolonial nationhood. The study uses the text of 'The Reluctant Fundamentalist' as its primary source: books, journals, and newspaper articles as secondary sources. The study also looks at the biography of Mohsin Hamid for understanding the cultural and political inclinations of the writer which, according to postcolonial perspective influences the writer's portrayal of Changez khan as the victim of cultural displacement. The study reaches its essence by concluding the exploitative behaviour of the Occident resulting in degenerating the Orients as argued by Edward Said.

Keywords: Post-colonialism, Fundamentalist, 9/11, History, Cultural Displacement.

Influence Of Hip-Hop Language Over the Non-Native Young Listener's speech.

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Abstract:
Hip-hop language has been the interest in sociolinguistic field due to its vocabulary and grammar. The study attempts to explore the influence of hip-hop language on the non-native young Pakistani listener's speech. hip-hop has gained popularity among youth from past three years also most popular music genre among all music in United States and all over the world. The study conducted interviews from 7 participants related to hip-hop language. The language of the participants is analyzed through the answers they provided. Each participant answered 6 questions based on their answers it was concluded that hip-hop language had an influence on their language.

Keywords: Hip-Hop Language, Pakistani listeners, Speech

The Pre and Post 9/11 Conflicts between the First and the Third Worlds: A Historical Analysis of Hamid's The Reluctant Fundamentalist

(Ref No. ICETEMS-21-189)
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Abstract: The tussle between the third world and first world are of great concern across the globe and it became graver after the attack on World Trade Center's twin towers in New York City on September 11, 2001. The study examines the novel through the lens of Dependency and Third Worldism theory using content analysis as its technique focusing on the representation of 9/11. The present study aims to explore the hidden realities, maltreatment and struggle between the economically self-sufficient, developed and prosperous first world and underdeveloped third world in The Reluctant Fundamentalist by Mohsin Hamid. Mohsin Hamid belongs to Pakistan who is educated in America. Changez, the protagonist in the novel devotes himself to America in the hope of a bright future whose outlook towards life receives a setback by 9/11 terrorist attack. The study examines the hidden faces which the third world and first world countries possess as part of international politics. The study tries to answer the questions as to what is the actual state of love, intimacy, cooperation and hate between these two sides. A few perspectives of true America are represented in the research such as the way they treat, consider, exploit and misjudge the people of third world. The study concludes by exposing the reasons of why Changez turns from a pro-American to anti-American individual. The study is helpful for future researchers who want to understand the position of the third world countries like Pakistan, Chile, etc. with respect to the first world countries like America, England etc.

Keywords: First World, Third World, 9/11, conflict.

HEALTH SCIENCE & PUBLIC HEALTH

Prevalence and Antibiotic Susceptibility of Salmonella Typhi Isolated from Tap Water Sources at District Peshawar

(*Ref No.* ICETEMS-21-020)
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Abstract: Salmonella typhi is a Gram-negative bacterium that causes water diseases and food diseases like gastroenteritis and many other infections. Salmonella typhi mainly causes typhoid fever, which has affected people for many years and is still spreading. The current study showed that drinking water sources at Peshawar were contaminated with S.typhi. In order to prevent the emergence of typhoid, steps should be taken on a war footing to stop the emergence and possible spread of infection. For this purpose, good sanitation measures and personal hygiene should be followed. While water is known to be a typical vehicle for the transmission of Salmonella typhi, 30 water samples of drinking water were collected from different areas of district Peshawar and subjected to enrichment culture for S.typhi on Xylose lysine deoxycholate (XLD), and Salmonella Shigella Agar (SSA) after identification of Salmonella typhi some biochemical tests like Triple sugar iron test, Indole test, Citrate test, Urease test, and Oxidase test were performed, and then Kirby Bauer or disc diffusion tests were used to confirm antibiotic resistance of bacterial isolates against specific antibiotics. Out of 30 samples 18 samples containing S.typhi were identified. Samples grown on XLD agar SS agar showed black-centered colonies. The further phenotypic confirmation, the isolates were subjected to different biochemical tests which are the Triple sugar iron test (TSI), Indole test, Urease test, Citrate test, Oxidase test, and Gram staining. In all of the isolates, catalase is positive, oxidase is negative, Triple sugar iron test is positive, indole negative, urease is negative, citrate is negative and gram staining confirmed gram-negative rods. After phenotypic and biochemical confirmation, an Antibiotic sensitivity test was performed via the Kirby Bauer disk method. The disks used were Gentamicin (10 μg), Ciprofloxacin (5 μg), Amikacin (30 μg), Cefoxitin (30 μg), Aztreonam (30 μg), Penicillins (10 μg), Cefotaxime (30 μg). After the antibiotic sensitivity was performed via Kirby Bauer disc diffusion method, the results showed that Gentamicin was 5% resistance, 5% intermediate, and 90% sensitive, Cefotaxime was 100% sensitive, Cefoxitin was 100% sensitive, Ciproflox8acin was 5% intermediate, and 95% sensitive, Penicillin was 100 % resistant, Aztreonam was 100% sensitive and Amikacin was also 100% sensitive. The aim of the current study was to detect and isolate the S.typhi from drinking water sources in Peshawar city. The study showed, higher rate of S.typhi prevalence in drinking water. This is an alarming situation and possible threat of emergence of typhoid infection in the city. The MDR isolates detected can cause severe illness. Antibiotics were used like Ampiciline (10μm) and amoxicillin (10μm), were resistance and cefataxime (30μm), Gentamicin (120 μm), Cefoxitin (30 μm), ciprofloxacin (5 μm), aztreonam (30 μm), Amikacin (30 μm). Steps should be taken on war footing to stop the emergence and possible spread of infection. For this purpose, sanitation measures and personal hygiene should be followed.

Keywords: Salmonella typhi, salmonella typhi in water, typhoid fever, enteric fever, salmonella

Impacts of Antimicrobial Resistance on the Health Security of Pakistan

(*Ref No.* ICETEMS-21-065)
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Abstract: The recent COVID-19 pandemic and other previous events including the Ebola crisis have highlighted the importance of strong and resilient health systems, focusing on health security following the International Health Regulations (IHR-2005). This study aimed to explore the status and relation of AMR with health security concerning IHR-2005 and GHSA along with the review of global experiences in applications of measures against AMR containment that can be applied in Pakistan to have better-protected health security. A scoping review of published and gray literature, as well as an institutional search was conducted to identify existing data. Along with the data extracted from the published literature, data from the IHR-2005 M&E framework was used to highlight the country level and global status, and correlation of the indicators and functions. A total of 97 unique articles were screened for systematic analysis. According to the study results, no country was found fully prepared for emergencies with a total GHS Index score of only 40.2%. It was also observed that countries having low overall health security scores, also scored low for the AMR and vice versa. Pakistan has an overall score of 35.5% for the GHS index and is ranked 105/195. The country has received the lowest possible score on the capacity to deal with AMR issues as per the IHR-2005 M&E framework component of JEE. One of the major hurdles for the containment of AMR in the country identified was the insufficient implementation of plans and strategies at the national and provincial levels to restrict AMR, have better-protected health security, and strengthening its overall healthcare system. This study has evaluated the globally available effective and easy to implement options that can be institutionalized in Pakistan within the available resources. In addition, possible weaknesses and fragmentation were identified in the available plans and strategies, and a way forward was defied to ensure a comprehensive NAP to combat AMR, enhance monitoring, and reinforce policies at both the federal and provincial levels. It is thus expected to prove as a guiding document for making our health system resilient and improving sustainability in health security. This study is one of the first attempts conducted, integrating scoping global review with data analysis exploring the status and impact of AMR on health security.

Keywords: Antimicrobial resistance, AMR, health security, national action plan, antibiotics

Psychological Distress and its Impact on Burnout of Healthcare Professionals during the Peak Period of COVID-19

(Ref No. ICETEMS-21-118)

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Abstract: The aim of this study was to explore the relationship of Psychological Distress of Healthcare Workers, Burnout, Resilience and Social Support during the rapid rise period of COVID-19 in third wave in Pakistan. Data was collected from 352 healthcare workers including medical doctors, dentists, pharmacists, nurses and other related professionals working either in public or private hospitals and clinics within the context of quantitative research approach through a questionnaire. Data analysis was performed through SPSS version 22. Results of data analysis showed that job psychological distress has a strong positive effect on the burnout of healthcare professionals during the rapid rise period of COVID-19 in Pakistan. A negative direct effect of social support and resilience was also confirmed towards healthcare professional's burnout. It was also established that social support and resilience negatively mediates the relation of psychological distress and burnout among the healthcare professionals. To the best of our knowledge, this study provides the first ever attempt to explore the relationship of psychological distress and burnout among Pakistani healthcare professionals during the rapid rise period of COVID-19 with the mediating impact of social support and resilience. Our study found that by promoting social support and resilience among the healthcare professionals, the negative impacts of psychological distress can be minimized and thus will lead to avoid burnout of the healthcare professionals. This study also attempts to contribute to the theoretical discussion in the field of psychological distress and HCWs burnout.

Keywords: COVID-19, Psychological Distress, Burnout, Resilience, Social Support, healthcare workers

Microbial Biofilm: An Important Weapon of Microbes against Antimicrobials

(*Ref No. ICETEMS-21-157*)

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Abstract: Microbial communities encapsulated in a self-produced matrix of extracellular polymeric (EPS) compounds constitute biofilms. Importantly, bacteria in biofilms have a set of emergent features that set them apart from bacteria in free-living cultures. Biofilms are resistant to antimicrobials and are a leading source of recurrent and chronic infections by clinically significant pathogens (*Escherichia coli, Pseudomonas aeruginosa* and *Staphylococcus aureus*) around the world. Presently, most biofilm remediation strategies are directed to prevent early stages of biofilm development, formation of biofilm dispersal or inhibition agents or to disrupt the biofilm cell community. Growth of microbial biofilm is disadvantageous in food, healthcare, marine industries and drinking water distribution systems etc. Various treatments and strategies interfering the bacterial adhesion, biofilm matrix and quorum sensing bacterial communication systems have been used to get rid of hazardous biofilms. Biofilms, however, also offer beneficial roles in a variety of fields including applications in wastewater treatment, bioremediation, and plant protection and corrosion inhibition amongst others. Development of beneficial biofilms can be promoted through manipulation of adhesion surfaces, QS and environmental conditions. Infections caused by biofilms are one of the most serious problems in modern medicine. As a result, a variety of preventive and control measures, such as mechanical, physical, and chemical procedures, can be used to effectively regulate biofilm production or eliminate mature biofilm. In current talk, the events which contribute to biofilm development, the positive and negative features of biofilms, the major strategies currently employed to limit the formation of harmful bacterial biofilms and the future prospects of biofilms will be discussed.

Keywords: Bacteria, biofilms, resistance, antimicrobials

Mechanical Properties of Adobe Air-Dried Bricks Assemblages Stabilized with Cow-Dung and Cement

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Abstract: Adobe is one of the earliest building materials which is used for bricks and the construction of low-cost housing. Adobe bricks are vulnerable to loads that result in degradation over time when used in construction. These bricks need to be durable enough to withstand the loads and degradation over the life of the structure it is used in. This study aims to identify the problems that need consideration in construction with adobe air-dried bricks. The soil samples for this study were collected from different sites of Peshawar and analyzed in the laboratory to find out different physical properties before it is used in the bricks. Different proportions of soil, cow dung, cement, and lime (17% and 20% cow-dung, 10%, and 15% lime, 10%, and 15% cement) were used in the construction of the adobe bricks. The assemblages were constructed with the selected proportion (Soil + 20% cow dung +15% cement) to study different mechanical properties of adobe air-dried bricks assemblages. Standard tests according to ASTM (Diagonal compression & prism compressive strength) were performed on the prepared samples. The diagonal compression test on a 2ft x 2ft sample resulted in shear stress of 3.4 psi and a shear strain of 0.05 mm/mm. The masonry prism test was performed on 3 units high prism that resulted in 80 psi masonry prism strength and 79.26 psi compressive strength of masonry. To make the masonry withstand the ground motions (earthquakes) and other forces such as surface erosion different techniques were studied, and recommendations are given based on that.

Keywords: Mechanical Properties, Adobe Bricks, Stabilizers, Cow Dung, Assemblages.

Socio-economic Status and Materal Healthcare Services in Pakistan

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Abstract: The aim of this study was to determine the association between maternal utilization of healthcare services and socio-demographic including maternal health status in terms of antenatal, natal and postnatal care, and socio-economic status of a peri-urban community among reproductive-age women in Pakistan. This cross-sectional study is conducted in peri-urban communities of Pakistan with the help of a questionnaire. We used the sample of married reproductive-age women. A systemic random sampling method was used to raise the study sample. We measured maternal utilization of health care services by using variables including number of antenatal care (ANC) visits, delivery assistance by a skilled healthcare provider, delivery in a health-care organization, Water/Sanitation, Assets, Maternal Education and Income Index. There were 1,275 participants in the study with an overall mean age of 31.6±8 years. The mean age of marriage was 19±3.6 years while the mean age of first childbirth was 20.8±3.6 years. Around 36.6% of women had made four or more ANC visits, 59% had received assistance from skilled health providers during delivery, and 55.3% had given birth in a healthcare facility. On multivariable logistic regression, all the variables were positively associated with education and wealth, and negatively associated with birth order and women's autonomy. Most of the participants did not give significant importance to postnatal care. Water/Sanitation, Assets, Maternal Education and Income index suggested poor socio-economic status of the community studied. Policymakers and health planners may use this findings to develop efficient strategies, particularly for uneducated women and those with poor economic status, to improve the utilization of maternal health-care services in Pakistan.

Keywords: Maternal health care, Socio-economic status, prenatal care, Postnatal care, health care facilities.

Prevalence of Antibiotic Resistant Bacteria among the Clinical Samples from Different Hospitals of Peshawar, Pakistan

(Ref No. ICETEMS-21-102)

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Abstract

Majority of the microorganisms are responsible for causing diseases which can be fatal if left untreated. In Pakistan this might be very critical because of the misuse and/or improper use of antibiotics.

The current study was designed to point out the challenges of antibiotic resistance in Peshawar Pakistan.

A total of 100 samples, 25 each from blood, pus, skin, urine was collected from four different hospitals of Peshawar, Pakistan. The samples were grown on culture media after collection.

Out 100 samples, 46 samples showed growth on culture medium. Four main isolates namely Staphylococcus aureus, Escherichia coli, Klebsiella pneumonia, and Pseudomonas aeruginosa. S. aureus and E. coli were found in all tested samples blood, pus, skin, urine. P. aeruginosa was found in pus and K. pneumonia in urine only. The identified strains were subjected to sensitivity testing against 7 different antibiotics i.e., ampicillin, piperacillin-tazobactam, doxycycline, aztreonam, ciprofloxacin, levofloxacin and teicoplanin.

All of the bacterial species were found resistant against the applied antibiotics except aztreonam.

Keywords: Prevalence, antibiotics sensitivity, *S. aureus*, *E. coli*, *K. pneumonia*, *P. aeruginosa*

MANAGEMENT SCIENCES

Covid-19 Precautions of Pakistani Banks: A Qualitative Study Approach

*(**Ref No.** ICETEMS-21-007)*
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Abstract: The purpose of this research is to explore the precautions taken by the Pakistani banks listed in the Security Exchange Commission of Pakistan (SECP) to control the spread of Coronavirus (COVID-19). This is a qualitative study for which the data were collected from the sample size of the 23 Islamic and commercial banks of Pakistan over the period January 2020 to June 2021. The data regarding precautions for COVID-19 and its related activities were taken from the websites of these banks. The analysis has been generated through NVivo software through thematic analysis to find the precautions taken by banks on their websites. The findings suggest that reasonable precautions have been taken by the sample banks to curb the spread of COVID-19 during the pandemic, which is discussed in the study. Moreover, the study further provides recommendations and implications for the top management of the banking sector, regulatory bodies, and other stakeholders to curb the spread of COVID-19 through banking operations.

Role of Leadership in Digital Transformation: A Case of Pakistani SMEs

(***Ref No. ICETEMS-21-013***)
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Abstract: Digital Transformation has become an important aspect that stimulates various academic areas and affects practice, contributing to independent research streams. In the recent fourth Industrial Revolution due to rapid technological development and the social and environmental changes caused by the COVID-19 pandemic, new sustainable growth approaches are expected from small and medium-sized enterprises (SMEs). The platform strategy to use firm's external capability has become vital to SMEs seeking digitalization and sustainability. This study identified the factors affecting SMEs' platform leadership and the strategies necessary for digital business consolidation and business continuity. Data was collected through a questionnaire survey targeting 376 Pakistani SMEs. Then the data was analyzed through SPSS and AMoS. Platform leadership was identified as a factor not directly affecting digital business consolidation and continuity. This shows that platform leadership should be implemented alongside the platform strategy. This study documents that SMEs' platform leadership affects platform strategy and the platform strategy has a positive effect on business digitalization and continuity.

Keywords: Leadership, Platform Strategy, SMEs, Digital Transformation

Challenge Stressors and Faculty Job Performance: The Role of Career Success Satisfaction during Covid-19

*(**Ref No.** ICETEMS-21-038)*
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Abstract: Stress is an integral part of teaching profession. Hindrance stressors can affect teaching faculty negatively whereas challenge stressors have positive effect on teaching faculty. Covid19 has increased the overall stress mainly due to online teaching mode and work from home (WHF). The faculty working in higher education institutions (HEIs) in general and the faculty appointed under tenure track system (TTS) were already under stress due to challenging job and goals. The aim of this study was to investigate the impact of challenge stressors (time pressure and workload) on the job performance of TTS faculty during Covid19 pandemic. This study also investigated the career satisfaction as moderator between challenge stress and job performance (under the prevailing Covid-19) circumstance. Survey technique was used for data collection from Ph.D. faculty appointed on TTS in HEIs of Pakistan. 129 TTS faculty participated in this study. Confirmatory factor analysis (CFA), VIF, correlation, reliability, and moderation tests were used. Results showed significant and positive impact of workload, time pressure on job performance of TTS faculty during Covid-19 pandemic. Moreover, career satisfaction was found to have moderating effect between challenge stress and job performance. Thus, it is concluded from the study that TTS faculty's performance is improved due to increase in challenge stressor during Covid-19.

Keywords: Stress, Challenge Stress, Workload, Time Pressure, Career Satisfaction, Job Performance, TTS faculty

Knowledge Management Capability, Innovation Ambidexterity, and Firm Performance: An Empirical Study

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Abstract: Rapid changes in contemporary business environment is forcing organizations to become more proficient to adjust themselves in the dynamic competitive environment to face global challenges. As such, organizations are relying more on offering new products and services, exploring new segments of markets, identifying venture opportunities, and/or seeking new ways of doing business, thus, innovation seems to be a potential solution to the survival and subsequent financial growth of organizations. For long-term survival and growth, organizations must involve in two forms of innovation activities – exploitative and exploratory – to tap on opportunities and cope with potential threats prevailing in the external business environment. The purpose of this study is to examine the relationship between knowledge management (KM) capability and innovation ambidexterity and their subsequent influence on firm performance. The study also investigates if organizational structure – connectedness and centralization – helps to develop suitable context which either hinders or catalyzes the effectiveness of KM capability in predicting innovation ambidexterity. Data were collected from 336 manufacturing organizations of Pakistan by using random sampling technique. Partial least square based structural equation modelling (PLS-SEM) was employed to analyze the data.Results depict that knowledge management (KM) capability is positively linked with innovation ambidexterity and firm performance. Innovation ambidexterity positively mediates the link between KM capability and firm performance. Connectedness positively moderates the association between KM capability and innovation ambidexterity. However, centralization negatively moderates the link between KM capability and innovation ambidexterity. This research contributes to a novel understanding regarding the importance of KM capability in fostering manufacturing organizations to engage in ambidexterity by creating a suitable context where right amount of each form of innovation is calibrated using KM capability.

Keywords: Knowledge management capability, innovation ambidexterity, organizational structure, firm performance

The Shades of Green: Linking Green Transformational Leadership and Green Innovation

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Abstract: Deteriorating environmental quality is affecting every sphere of human life, including business activities. Therefore, firms are increasingly looking for new ways of doing businesses which have least negative impact on the natural environment. In this regard, leadership in firms can play important role because leaders have the authority to decide and control over the organizational resources. If leaders in the organizations have faith in green shades, they will ultimate develop green capabilities and will introduce green innovation according to the changing natural environment. The objective of this study was to examine the role of environmental dynamism in the relationship between green transformational leadership and green innovation in SMEs. The data for this study was collected from the 234 manufacturing SMEs. This study employed PROCESS MACRO model 1 to test the hypothesized relationships between the study variables. The findings suggests that green transformational leadership promotes green innovation in SMEs. In addition, it was found the interactive effect of green innovation and environmental dynamism also significantly and positively influences green innovation. In particular, those organizations which practice green transformational leadership and operate under highly dynamic environment are more innovative than those which operate under stable environment. The findings suggests that firms should practice green transformational leadership for green innovativeness when operate under highly dynamic environment. This study has used cross-sectional method to collect the data by using a convenience sampling technique which is a major limitation of this research. For green innovation in SMEs, green transformational leadership crtical, because such leader puts high emphas on greening the organizations under dynamic environment. Thereroe, SMEs must practice green transformational leadership for environmental frineldy processes and products.

Keywords: Green Transformational Leadership, Green Dynamic Capabilities, Green Innovation, Environmental Dynamism, SMEs

Impact of Terrorism on the Stock Returns of Commercial Banks: Evidence from Pakistan Stock Exchange

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Abstract: One of the fundamental issues in finance is the investigation of factors affecting stock returns. Stock returns are one of the most important metrics to gauge firm performance and investors take this into high regard when making investment decisions. The aims this study is to determine the reactions of terrorism to the stock returns of commercial banking sectors in Pakistan. The standard market model event study methodology is used to analyse abnormal returns and cumulative average abnormal returns of the commercial banks in Pakistan. Impacts of two sets of terror events are estimated; firstly events that occur in financial cities with stock markets, non-financial highly densely populated cities, and capital cities of provinces of Pakistan, secondly the nationality victimization factor. The study was based on secondary daily time series data ranging from 2005 to 2018. The data of stock returns of banks have been gathered from KSE 100 index, and the data of terrorism from the global terrorism database GTD respectively. Two key findings are established here; first, the events that occur in financial cities with stock markets, non-financial highly densely populate cities, and capital cities have significant negative impacts on bank's stock returns, secondly, local victimization has no significant impact while foreigner victimization has a significant adverse impact on stock returns of commercial banks.

Keywords: Terrorism; Stocks returns; Global Terrorism Data Base (GTD); KSE 100 index, Commercial Banking Sectors.

Impact of Abusive Supervision on Turnover Intention with Moderating Role of Psychological Contract Breach in Medical Sector of Khyber Pakhtunkhwa

*(**Ref** No. ICETEMS-21-141)*

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Abstract: Purpose of this study was to examine the Impact of abusive supervision on turnover intention of employees working in medical hospital of KPK, Pakistan. The study also explored the moderating role of Psychological Contract Breach in this particular relationship of "abusive supervision and psychological contract breach. The survey was conducted on employees working in three medical hospital of Kohat, DIKhan and Bannu Districts of KPK, Pakistan. Data was collected from 94 personnel through convenience sampling technique, using adopted questionnaires consisting of measuring each variable on five pointlikert scales. Results indicates that abusive supervision has a positive and significant relationship with turnover intentions of employees. The moderating role of psychological contract breach between the relationship of abusive supervision and turnover intentions of employees was also supported by the results. Therefore, organizations should create and promote a mutually trusted environment, and psychological contract breach can be used an important buffer to reduce the negative emotions of the employees for the effective functioning of organizations in this era of globalization.

Key words: Abusive supervision, Psychological contract breach, Turnover intentions of employees

Pharmaceutical Marketing also depends upon Marketing Mix Elements: A Myth or Reality: Quantitative on Prescription Behavior of Physicians

(*Ref No.* ICETEMS-21-144)
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Abstract: Recently each and every industry is under severe competition. Especially after the outbreak of COVID-19 the decrease in income and opportunities to consumers are making the competition much stiff. However, that is not the case for the pharmaceutical industry where panic and fear of disease resulting in an increase in purchases. However, still, the competition requires efforts in form of sales as well as marketing and therefore use of marketing mix strategies looks compulsory in this regards. However, there is no recent study that highlights the use of marketing mix elements for the pharmaceuticals sector of Pakistan. On the other side, most of the studies under this vein are qualitative and rare focus found towards inferential testing and incorporation of the full range of criterion-related with marketing mix strategies. Therefore, this study will uncover the use of marketing mix strategies on prescribing behavior associated with prescription-only medicines by general physicians practicing in Karachi. The sample size for the study is 150 and analysis has been conducted through using SMART-PLS in order to support the theory-building approach. Results indicated that the use of marketing mix strategies has a significant impact on the prescription behavior of general physicians practicing in Karachi. However, the moderation of gender also has an impact on prescription behavior.

Keywords: Marketing Mix Strategies, Prescription Behavior. Prescription only medicines & General Physicians

Outbreak of Covid-19 and Sustainability in Hospitality Industry: A Quantitative Analysis on Use of Crises Management Strategies

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Abstract: COVID-19 created serious issues for all sorts of industries. However, the tourism and hospitality industries are top-ranked industries in terms of the hit produced by the outbreak of COVID-19. Researchers all over the globe are concentrating on these veins but most of the studies are related to tourism rather than the hospitality industry. On the other sides, there are very few studies that indicate the strategies and their role for the organization in the eve of COVID-19. However, there are some studies that reflected strategies for combating the prevailing situation though not thoroughly relate strategies with the organizational performance. Therefore, this study will uncover the use of crises management strategies with reference to the hospitality industry of Karachi. Thus, study tries to uncover the significance of strategies in attaining sustainability. The sample size for the study is 100 which have been collected from managerial level employees of well-known restaurants of Karachi.

Keywords: Marketing Mix Strategies, Prescription Behaviour. Prescription only medicines & General Physicians

Issues and Financial Awareness of Small and Medium Enterprises in the Newly Merged Districts of Khyber Pakhtunkhwa

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Abstract: The purpose of this study was to analysis the SMEs and banking services awareness in newly merged districts area FATA its show that how the SMEs sector owner aware of banks services and what are the problems they face after exemption FATA into KP. A study was interview base research was designed to answer research questions, using qualitative techniques were adopted. Data was collected through semi-structured interviews from 7 respondents. Data were analysed by using a coding process which may include;(Data collection from organization and Question wise compilation, Reading and memo writing to get meaningful information and highlight key points, Describing data into codes and themes, Classifying data into Coding and themes, Coding cycle have two processes 1) Pre-defined codes 2) Data-driven codes, Presentation of data and Interpretation of data). The finding of this study is community awareness of banking services and SMEs in newly merged districts area its show that the FATA SMEs contribute a lot to Pakistan economy but still, they faced problems and government have announced 20 billion incentives for FATA but it was just dialogues, Bank was not cooperated with SMEs in Newly merged districts area FATA because such sector demand for huge loans and pay higher interest on meantime under worthy to believe and Federal Board Revenue (FBR) announced good news for SMEs sector that five-year tax was exempted but still FATA SMEs sector faced tax issues. The study concludes that why SMEs sector in FATA still facing such critical problems which could destroy the economy of Pakistan result suggest that to bring an increase in production will boost up the country economy and also help in the reduction of poverty, unemployment and ignorance will end in at last standard of living will be improved though it could be possible when government plays on the beneficial role. The contribution of the current study is to explore the theoretical and practical aspects of the SME's and bank services awareness performance in newly FATA merged districts area. The theoretical study is based on the analysis of the research publications, and the practical aspects are analysed using Data Analysis process.

Keywords: Financial Awareness, Financial Literacy, SME, Qualitative, FATA

Determinants of Employee Silence and its Effect on Behavioural Outcomes: A Study of Hoteling Industry of Peshawar

*(**Ref No.** ICETEMS-21-192)*
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Abstract: This research intended to examine the employee silence and its effect on the behavioural outcomes; a study of hoteling industry of Peshawar. The population of the study comprised of hoteling industry of Peshawar. A survey-based research was designed using adapted questionnaires. Questionnaires were distributed among 900 employees working in hoteling industry of Peshawar. 654 respondents' data was used for the analysis purpose using PLS-SEM. The findings of this study exposed that the relationship of determinants of employee silence and behavioural outcomes has a positive relationship and the constructive role has showed a moderating effect on this relationship in hoteling industry of Peshawar. The result of this study shows that employee silence is effected by silence motives (acquiescent/defensive/prosocial/opportunistic) and its antecedents factors (organization/individual/). While employee silence has the positive effects on (conflict) behaviour and have negative affect on (burnout/job-disengagement/job-Staisfaction/productivity/turnout) behaviour outcomes. The moderating role of supervisors was found to have a role in employee silence and outcomes in hoteling industries of Peshawar. Hoteling industries of Peshawar should focus on preparing the employees with the fundamental knowledge and perception. Supervisor/manager should be able to emphasis on their silence behaviour and its outcomes i-e silence factors and consequences of behaviours. As an organizational and employee success depends on daily work, so a very serious attention is essential by the hoteling industries of Peshawar to the field. Supervisor/manager in the hoteling industries has enough of knowledge that can manage the factors that affect employee's behaviour outcomes. For the sake of practitioners, this study has recognized that employee silence and its factors is create hurdle for different job outcomes. Constructive moderating role was a significant variable in this research, it makes moderator to the relationship of supervisor/manager and dimension of employee silence, factors and behaviours outcomes. This study further will help management of all other private sector to encourage the communication power and also contributes to existing field of knowledge and practically provides motivation to speak up to remove the employee silence perception.

Keywords: Employee Silence, Supervisor Role, Behavioural Outcomes, Quantitative, Hoteling Industry

Impact of Procedural justice on job performance with mediating role of work Engagement and Effective organizational commitment and the moderating role of Perceived organizational support in Telecom sector in Pakistan

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Abstract: This study is intended to examine the effect of procedural justice on job performance. Further the mediating effect of affective organizational commitment and work engagement is examined between the main relationship of procedural justice and job performance. Moderating effect of perceived organizational support was examined between procedural justice and mediating constructs affective organizational commitment and work engagement. Cross sectional research design was used for this study. 200 sample respondents from Pakistan's telecom companies filled self-administrated questionnaire. Data was analyzed by SPSS. Correlation and regression analysis was used to examine data. Results reported that procedural justice has significant impact on job performance. However, affective organizational commitment and work engagement did not moderate the main relationship between procedural justice and job performance. Perceived organizational support moderated the relationship between procedural justice and its outcomes affective organizational commitment and work engagement.

Factors Influencing Restaurant's Electronic Word-of-Mouth: A Study of Peshawar Food Diaries

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Abstract: The purpose of this study was to find out the factors determining electronic word of mouth (E-WOM) of Restaurants and to do an assessment of the effect of customer feedback on the E-WOM of Restaurant. Independent variables of this study are service quality, food (quality, image, variety, and price), and information (credibility, quality, and depth), moderating variable is customer's feedback and the dependent variable is E-WOM. Primary data was collected through an online survey questionnaire from 306 peshawar food diaries (PFD) members. This survey questionnaire is adapted and integrated which was based on 5 points Likert scale. SPSS & Smart-PLS were used for data analysis. Data were tested on Reliability and validity, Discriminant validity, R2, Collinearity Statistics, and P-value. After Data analysis, the findings reveal that service, food, and information are affecting E-WOM. The moderator customer's feedback was not supported. Thus, customers feedback is not playing a moderating role between food, service quality, information, and E-WOM. This study identifies that how customers influence by service quality, food (quality, image, variety and price) and information (credibility, quality, and depth) through E-WOM.

Keywords: E-WOM, Service Quality, Food, Information, Customer Feedback

Analyzing Market Forces of Fresh Milk in Multan, Pakistan
(Ref No. ICETEMS-21-143)

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Abstract

The current study understands prime factors that influence the production and consumption of fresh milk in Multan, Pakistan. The results show that the demand for fresh milk is influenced by factors such as family size, fresh milk price, consumer income and family expenses. Fresh milk consumption is substantially influenced by age and the educational background of consumers. Production of fresh milk is affected by factors such as strength of milking animals, concentrate value and sale price. Other factors such as farming experience, fodder value, credit facility, and labour costs minimally affect fresh milk production. The technique of multiple linear regression was used to determine the effect of each of the variables in log form. Two research surveys were conducted. While one survey was undertaken to check fresh milk consumption patterns, the second one aimed to understand factors affecting milk production. Data was randomly collected from fifty milk consumers and fifty dairy farmers based in rural, urban, and peri-urban regions of Multan district. The study concludes that there is an urgent need to review the pricing mechanism to make milk available at a lesser price to consumers. Such conclusion is expected to bring the attention of government bodies towards development of polices protecting the interests of milk producers and minimize role of intermediaries to protect them from possible exploitation.

Keywords

Fresh milk production, Mulching animals, Livestock, Demand, Supply

Impact of Corporate Governance on Financial Performance: A Case of Banking Sector of Pakistan

(Ref No. ICETEMS-21-024)

Abstract:

The purpose of the study was to examine impact of corporate governance on financial performance of listed commercial banks in Pakistan Stock Exchange. Purpose: The study aimed to answer three research questions: firstly, to what extent does board size affect listed commercial banks' financial performance in Pakistan? Secondly, how does directors' equity interest affect listed commercial banks' financial performance in Pakistan? Finally, how board gender diversity affects commercial banks' financial performance in Pakistan? Methods: The study used the descriptive research design. The longitudinal survey research approach was used to collect data from year 2013 to 2019. The study adopted the purposive sampling technique. The target population for the study was listed commercial banks in the Pakistan Stock Exchange (PSE). The sample size for the study was 20 commercial banks listed in the PSE. The data was collected from annual reports and the banks' websites by a data collection sheet for each of the banks which collected the ROE, ROA, directors' equity interest, board gender representation and size of the board. Data analysis was done by the SPSS Version 21. Descriptive and Inferential statistics were used to analyze the data. These were Pearson correlation analysis and regression analysis. In regard to board size, the study found that the average size of board size of the sampled banks was 10 board members. The correlation analysis indicated a positive and significant relationship between board size, director equity interest and board gender diversity but not with ROE. Results: The regression analysis showed that an increase in board size, directors' equity interest and board gender diversity led to an increase in ROA and this was significant. However, this was not observed for ROE. The study concludes that board size has a positive and significant effect on performance of commercial banks listed in the PSE; that director equity interest, board gender diversity had a positive effect on financial performance of commercial banks listed in the PSE but this was insignificant. The study recommends that commercial banks should not exceed the average nine board members' as this may lead to decision-making problems which are characterized by larger board of directors; that director ownership should be implemented as an emolument strategy in commercial banks to improve their performance and more inclusion of women in their boards to enhance board diversity which has been recommended as a best practice in the corporate governance research and practice.

Keywords: Corporate Governance, Financial Performance, Pakistan Stock Exchange

Performance appraisal system for secondary school teachers in punjab

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Abstract

The study was made to find the perceived level of effectiveness/ importance of our performance appraisal system for secondary school teachers working in government high schools. The main statement of the problem was how we can improve our existing teacher performance evaluation at secondary level in Punjab. Thirty Six District Education Officers (S.E.) participated in the study. The researcher developed a questionnaire to be marked by the DEOs about the effectiveness of appraisal system designed for the SSTs. The collected data was entered into SPSS and the results were found using descriptive statistics. From the results, it was shown that the present appraisal system of moderate level. Some better indicators of performance must be included in PER to be marked by reporting officers. There were found certain challenges to check properly the performance of a teacher. The Practical and potent suggestions were made on the basis of findings to make up the appraisal system parallel to award the annual increments and promotion of the teachers. The necessary changes were suggested to be incorporated in the Performance Evaluation Report PER of the teaching staff

MATHEMATICS & COMPUTATION

Fractional modeling of Maxwell Fluid Flow Containing Clay nanoparticles

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Abstract:
In the present paper, unsteady free convection flow of Maxwell fluid containing Clay-nanoparticles is investigated. These particles are hanging in water, engine oil and kerosene. The values for nanofluids based on the Maxwell-Garnett and Brinkman models for effective thermal conductivity and viscosity are calculated numerically. The integer order governing equations are being extended to the novel non-integer order fractional derivative. Analytical solutions of temperature and velocity for Maxwell fluid are build using Laplace transform technique and expressed in such a way that they clearly satisfied the boundary conditions. To see the impact of different flow parameters on the velocity we have drawn some graphs using Mathcad software. As a result, we have seen that the fractional model is superior in narrate the decay property of field variables. Some limiting solutions are obtained and compared with the latest existing literature. Moreover, significant results can be observed for clay nanoparticles with different base fluids.

Keywords: CPC fractional derivative; Clay nanoparticles; Heat transfer; Vertical geometry

The Effect of Superparamagnetic Iron Oxide Nanoparticles on the Electroosmotic Blood Flow with Heat and Mass Transfer: A Time Fractional Model

(**Ref No.** ICETEMS-21-005)
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Abstract: Presently, there are various uses of nanoparticles in science and technology. In biomedical, they are applicable for drug delivery purposes. Their uses are attracting attention of researchers due to negligible side effects in cancer therapy as well as in the treatment of other ailments. In the class of nanoparticles, the biocompatible superparamagnetic iron oxide nanoparticles (SPIONs) have attracted a great deal of attention because of their excellent superparamagnetic properties. The present paper investigates the electro-osmotic flow of blood along with superparamagnetic iron oxide nanoparticles through a vertical micro-channel under the effect of heat and mass transfer. The base fluid, blood is treated as a Casson fluid. This physical phenomenon is modelled in the terms of partial differential equations (PDEs). Some appropriate dimensionless variables are used for non-dimensionalization of the system of differential equations. The generalized Fourier and Fick's law is used to fractionalize the dimensionless system. The Laplace and Fourier transforms are used to obtain the exact solutions. The effect of various physical parameters on the flow is shown and discussed graphically. The study reveals that the fluid flow is strongly influenced by electro-osmotic parameter.

Keywords: Electroosmotic Flow, Blood Flow, Casson Fluid, Superparamagnetic Iron Oxide Nanoparticles, Caputo Fractional Derivative.

A Time Fractional Model of Brinkman-Type Nanofluid with Ramped Wall Temperature and Concentration

(*Ref No. ICETEMS-21-037*)
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Abstract: Nanofluid is an innovative heat transfer fluid with superior potential for enhancing the heat transfer performance of conventional fluids. Many attempts have been made to improve the heat transfer rate and thermal conductivity of regular base fluids by adding different types of nanoparticles. In the present paper, we study the unsteady electrically conducting flow of Brinkman-type nanofluid over an infinite vertical plate with ramped wall temperature and concentration. Water is considered as base fluid, and multi-walled carbon nanotubes are equally dispersed in the base fluid. The classical model is generalized with the Caputo-Fabrizio fractional derivative, which has a non-singular kernel. The exact solutions are obtained through the Laplace transform technique. Furthermore, the solutions are portrayed through different graphs for fractional as well as different physical parameters. All the figures are drawn for both the cases, i.e., Ramped and isothermal wall temperature and concentration. Finally, the skin friction, Nusselt number, and Sherwood number are tabulated. It is noticed that the heat transfer of pure water enhances up to 17.03% by adding 4% of nanoparticles in it.

Keywords: Nano Fluid, Brinkman Type Fluid, Ramped and Isothermal Wall Temperature and Concentration, Fractional Derivatives.

Time Fractional Analysis of Uniport Phenomena Based on Chemical Kinetics

(*Ref No. ICETEMS-21-048*)
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Abstract: Mathematical modelling is an indispensable tool for research and development in biotechnology and bioengineering. The formulation of kinetic models of biochemical networks depends on knowledge of the kinetic properties of the enzymes of the individual reactions. The present study aims to describe the dynamics of the uniport transport phenomenon across the cell membrane of a living cell. This phenomenon is modelled in terms of classical ordered coupled non-linear ODEs under the law of mass action. Then the classical model is generalized with Caputo fractional derivative. The graphical solutions are achieved via a numerical scheme, and the simulations for the model are carried out through the computational software MATLAB. The effect of a fractional parameter is shown for the concentration of different species. Additionally, the impact of different forward and backward reaction rates is also shown through different graphs and discussed in detail. It is concluded that forward rates speed up the reaction while backward rates slow down the phenomenon and take more time to vanish.

Keywords: Uniport phenomena, chemical kinetics, Caputo, numerical solutions.

Dynamics of Love Affair of Romeo and Juliet through Modern Mathematical Tools: A Critical Analysis via Fractal-Fractional Differential Operator

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Abstract: People say love is pure, painful, sweet, and dreadful, all at once. The truth is, love is a basic necessity in everyone's life. Everyone needs to be loved to live a proper and healthy life. Love is a variety of feelings, emotions, and attitude. For some love is more than just being interested physically in someone, it's an emotional attachment. However, it is believed that 'Mathematics is the language in which the GOD has written the universe' and this is proved by transforming every phenomenon in the language of mathematical equations. On this basis, the aim of the present work is to express the feelings between Romeo and Juliet via mathematical tools. The love between Romeo and Juliet is expressed in the form of coupled system of ODEs. The classical differential equations are further generalized through the fractal fractional differential operator with Mittag-Lefler function. Some theoretical analysis has been done for the considered problem. The graphical solution is obtained through a numerical scheme with the help of MATLAB software. The effect of fractional order parameter and fractal dimension parameter is shown on the feelings of both individuals. Furthermore, the effect of different physical parameters on the love or hate of Romeo and Juliet is displayed and discussed in detail. As concern to the most sensitive parameter, it is observed that spending or saving money among both individuals has the ability to tend love into hate and vise-versa.

Keywords: Love Affair, Romeo and Juliet, Fractal-Fractional Derivative, Mittag-Lefler function, Numerical Solution.

Effect of Newtonian Heating on the Mhd Two-Phase Fluctuating Flow Of Casson Dusty Fluid Between Two Parallel Plates

(*Ref No. ICETEMS-21-057*)
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Abstract: This paper aims to discover the influence of the Newtonian heating effect on Casson dusty fluid in a two-phase fluctuating flow. The dusty Casson fluid of two-phase fluctuating flow is considered between two non-conducting parallel plates with magnetohydrodynamics. The dust particles are considered of spherical shape and uniformly distributed throughout the base fluid. The heat generation/absorption has also been taken into account. The above flow regime is modeled in terms of partial differential equations. The assumed periodic solutions reduce the coupled governing partial differential equations (PDEs) to ordinary differential equations (ODEs). The perturb solutions are obtained for both the velocities (fluid and dust) by applying the Poincare-Lighthill perturbation technique (PLPT). Similarly, solutions for fluid and particle energy equations are obtained. The effect of various embedded parameters on fluid velocity, the dust particle velocity, and temperature profile are discussed and shown graphically. The rate of heat transfer and skin friction is also calculated, which are very important fluid properties for engineers. It is shown in Table **1** that increasing the value of the particle concentration parameter**,** the rate of heat transfer increases. Furthermore, Table **2** shows that by increasing the Casson parameter**,** the skin friction increases.

Keywords: Oscillating Two-Phase Fluctuation Flow, Heat Transfer, Mhd, Dust Particles, Newtonian Heating Condition (NHC).

Couette Flow of Viscoelastic Dusty Fluid Passed a Porous Oscillating Plate in a Rotating Frame Along With Heat Transfer

(Ref No. ICETEMS-21-058)
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Abstract: An investigation is performed to study the effect of suction/injection on Couette flow of viscoelastic dusty fluid passed over the porous oscillating vertical plate in a rotating frame. The effect of heat transfer is also taken into account. Usually, as Suction/Injection is used to control the fluid flow in the channel that's why this worth noting effect is considered perpendicular to the plates. The fluid velocity is considered along the right plate while the right plate oscillates with sine and cosine oscillation. The flow of the subject fluid on the right plate is enhanced by free convection. The fluid and dust particles have complex velocities due to the rotation, which are the sum of primary and secondary velocities. To, convert the aforementioned physical phenomenon into mathematical form Partial differential equations are used for modelling the subject flow regime. Dimensionless variables have been derived using the Buckingham-Pi theorem to non-dimensionalize the system of governing equations. The govern system of PDEs are reduced to the system of ODEs with the help of Assumed periodic solutions and then solved by the perturb solution of Poincare-Light Hill Techniques. The noteworthy Nusselt number and skin friction are also determined. Furthermore, parametric influences on Nusselt number, viscoelastic fluid and dust particle velocity profiles are examined. The effect of the uniform suction and injection on both the velocity and temperature distributions is examined.

Keywords: Porous Plates, Two Phase MHD flow, Heat Transfer, Oscillating plate, Light-Hill Technique.

Fluctuating Hydromagnetic Flow of Viscous Fluid With Heat and Mass Transfer in a Rotating System: A Time Fractional Model

(Ref No. ICETEMS-21-066)
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Abstract: This article aims to investigate the unsteady hydromagnetic free stream fluctuating flow of an electrically conducting fluid in a rotating system. The heat absorption and chemical reaction are also considered. The problem is modelled in the form of partial differential equations. The equations are dimensionalized using appropriate dimensionless variables. The closed form solutions for the dimensionless velocity, energy, and concentration distributions are obtained using the Laplace transform technique. Graphical results are displayed for different parameters like thermal Grashof number, mass Grashof number, rotation parameter, heat absorption parameter, and chemical reaction parameter. The effect of various parameters has been portrayed in the table as well and discussed. It has been found that when the value of m increases, the primary velocity falls near the plate and increases as the fluid moves away from it.

Keywords: Newtonian Viscous Fluid, Heat and Mass Transfer, Rotating System

Electromagnetic Flow of Casson Nanofluid Over A Vertical Riga Plate With Ramped Wall Conditions

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Abstract: The present study aims to investigate theoretically the Casson nanofluids flow over a vertical Riga plate. Concrete is taken as base fluid while the clay nano particles are added into the base fluid. The flow regime is formulated in terms of system of partial differential equations. Using dimensionless variables, the system of equations with the imposed boundary conditions are non-dimensionalized. Exact solutions are calculated by applying the Laplace transform technique. The effect of various embedded parameters on velocity, temperature, and concentration fields are shown graphically and discussed. The skin friction, Sherwood number, and Nusselt number are calculated and the effect of various parameters of interest are shown through tables.

Keywords: Riga plate, Nanofluids, Clay Nanoparticles, Exact solution

Magnetohydrodynamics Flow of Time Fractional Model of Casson Nanofluid By Using Generalized Fourier And Fick's Law Over an Inclined Channel

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Abstract:

Abstract: Gold nanoparticles are commonly used as a tracer in laboratories. They are biocompatible and can transport heat energy to tumor cells via a variety of clinical techniques. Because cancer cells are so small, appropriately sized nanoparticles were delivered into the bloodstream for infiltration. As a result, gold nanoparticles are highly effective. Therefore, the current research investigates the magnetohydrodynamic free convection flow of Casson nanofluid in an inclined channel. The above flow regime is formulated in terms of partial differential equations. The system of derived equations with imposed boundary conditions is non-dimensionalized by using appropriate dimensionless variables. Fourier's and Fick's laws are used to fractionalizing the classical dimensionless model. The Laplace and Fourier sine transformations with a new transformation are used for the closed form solutions of the considered problem. The ultimate result is expressed in terms of a specific function, the Mittag-Laffler function. The obtained solutions are displayed through different figures and tables. The impact of different physical parameters on the considered blood flow is displayed and discussed in detail.

Keywords: Inclined Chanal, Casson fluids, Blood, Gold nanoparticles, exact solution

SOCIAL SCIENCES

SUSTAINABLE ARCHITECTURE

Exploring precincts of historic sites for tourism in Islamabad: Case of access road to historic Rawat Fort

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Abstract: The city of Islamabad is surrounded by many fascinating places, including built heritage sites dating back thousands of years. One such site is a 16th century fort at RAWAT about 18 km from Islamabad, adjacent to the Grand Trunk Road (G. T. Road). The information displayed at Rawat Fort by the archaeology department reveals that the fort was founded as a caravanserai in the 15th century by Salateen-e-Dehli. This 300'x300' square shaped fort has an interesting form and geometry, constructed with a combination of stone masonry and bricks. The restoration of the fort has started in recent months. It is anticipated that once the fort is restored, it would attract both local and foreign tourists. The fort is at a walking distance of 2 to 3 minutes from the main G. T. Road via a street. This street, which at present, is lined with both commercial as well as residential activities, is the focus of this study. Hence, the emphasis lies in the question of how destinations should be prepared for being responsive to urban tourism planning, while enhancing the current socio economic activities. The study aims to address the issue of envisioning 'urban tourism planning' and proposes an intervention to make the area more sustainable for tourists. The idea discussed in the paper is to bridge the gap between tourism, urban planning and its environment while investigating the interrelationship of the aforementioned areas. The fort's vicinity is densely populated with both residential and commercial activities, and currently does not cater for any touristic activity. It can be envisaged that the tourist influx will drive people to transform their properties and businesses in order to cater for the potential tourists. Furthermore, if this 'urban change' is not visualized and planned ahead, it may result in chaos. The methodology developed to analyze the precincts of this historic fort is adapted from the concept of 'placemaking' given by Project for Public Spaces, Inc – PPS. The method of study used here is based on primary and qualitative analysis of the area through physical and visual surveys, mapping, user analysis, study of visual quality, and land use. The intervention created by the findings of the research will invigorate the precincts of the historic building. It will also provide opportunities for further economic programs for achieving sustainability with respect to the local context. It is suggested that the restoration of any historic project need not be done in isolation, but should also take into consideration its immediate context as well. Restoration of historic places invites visitors and as a result creates an impact on the environment. It is necessary to study and foresee this impact; and to create a master plan for such historic buildings, along with its consideration of social, cultural, economic and morphological context in a systematic way.
Keywords: Historic built environment, Islamabad, Rawat Fort, Placemaking, Tourism, Streetscape

Use of Agriculture Waste for Development of Green Concrete
(*Ref No. ICETEMS-21-210*)

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Abstract: Concrete is a mixture of coarse aggregates,fine aggregates and water-cement ratio. Green concrete is a concept of using eco-friendly materials in concrete, to make the system more reliable, efficient and sustainable. Agricultural wastes can be utilized as supplementary cementitious materials (SCMs) in concrete manufacturing might contribute to global environmental and economic efficiency of construction. In this study, the blend of agricultural wastes such as wheat straw ash (WSA), rice husk ash (RHA) and Bagasse ash (BA) was used as a partial replacement of cement by 15% and 21 % in the production of green concrete. Several Tests including workability, compressive strength, splitting tensile strength, flexural strengths were performed at the age of 7 and 28 days to understand the behavior of concrete. In substitution level of 15% the incremental trend in compressive strength was observed as 5.43% and 2.81% in comparison with the control sample at the age 7 and 28 days respectively. Workability was observed in decreasing trend with increasing the replacement of agricultural wastes. Also, with the increasing replacement level the strength properties were observed in decreasing pattern in comparison to the control sample. Furthermore, 15% replacement provided good results. Hence, this study provides a sustainable construction material which will conserve the earth natural resources and provide a better use of agricultural wastes.

Keywords: Agricultural Wastes Ashes, Green Concrete, Workability, Strength Properties

Strategies for Passive and Hybrid Cooling in Buildings: A Global and Local Perspective

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Abstract: The buildings sector in Pakistan consumes 45% to 50% of the total energy used in Pakistan for cooling, heating, lighting and construction. This high consumption is despite the fact that a majority of the buildings in the rural and urban areas here use low or no energy for comfort and lighting. This high percentage of building energy use is expected to rise further in Pakistan in the future due to more buildings being air-conditioned and heated for thermal comfort. Population growth of 2.4% in Pakistan, the highest in Asian countries, is going to require more buildings to be built that would be cooled and heated, which would further exacerbate the current energy imbalance due the dismally low supply of energy in all sectors. According to one estimate, there was 27% shortage of electricity generation over demand in the year 2020, as a result of which Pakistan faced severe load-shedding problems. The aims and objectives of this paper are to investigate and document case studies of existing buildings and systems, which use passive and hybrid cooling technologies in Pakistan and in other countries. Building design methods such as building orientation, shading of the building envelope, using building mass and insulation, applying exterior building colors are a few strategies, which have been examined as a first line of defense to preclude heat gains into the buildings. Furthermore, design strategies such as landscaping, green roofs, courtyards, Cool Towers and "terra-tecture" (earth-sheltered buildings), are investigated for their effects on human comfort and for reducing fossil-derived fuels for cooling. Hybrid cooling systems such as whole-house fans, geo-exchange, and desiccant dehumidification coupled with evaporative cooling, to name a few, have also been investigated. The research methodology involves examining local and global examples of passive cooling and hybrid cooling in buildings, which are presented in this paper that would exemplify qualitative and quantitative benefits of the various passive cooling and hybrid cooling systems in buildings. The conclusions in this research highlight the natural weather elements such as wind and solar -- passive cooling systems such as green roofs, Cool Towers, earth-sheltered buildings -- and hybrid cooling systems, such as whole house fans, solar cooling and desiccant dehumidification coupled with evaporative cooling promote comfort conditions in buildings and by default, conserve on fossil-derived energy for cooling of buildings for thermal comfort.

Keywords: Passive cooling, Hybrid cooling, Building energy, Evaporative cooling, Cool Towers

Effectiveness of Passive Design Approach for A Climatically Suitable Building: Analyzing a case in Karachi

(**Ref No.** ICETEMS-21-043)
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Abstract: A fully sustainable building or zero building is a utopian idea that only exists in concepts and theories. Today, modern world is fully dependent on mechanical systems. Thus, buildings strive to be more energy-efficient, that is if the building system fails it still functions properly. Therefore, architects and developers lean on the ideals of energy-efficient buildings through means of climatic responsive design by passive means and the use of vernacular materials and methods. The paper explores this idea of an energy-efficient building; how is it being practiced in our context of Pakistan and to what extent the methodology is effective in conserving energy. It also explores the usage of local material as an economical means of construction and how it generates a comfortable social environment for humans. The effectiveness of the passive design approach for a climatically suitable building is examined by analyzing a building in Karachi based on the aforementioned parameters. Ojha, Campus DUHS Karachi, is taken up as a case study for research on climate responsive design. Multiple qualitative analyses based on observations, user analysis, document study, and a real-world design project are reasoned to meet the research objectives. The paper suggests and tests the research methodology. In addition, it also draws rules for future design as well as cognition and revival of passive design as means of going green and moving towards a more sustainable urban development.

Keywords: Climatic Responsive Design, Sustainable Architecture, Energy Efficiency, Thermal Comfort, Ojha Campus