



ISSAT

3rd International Seminar of Science and Applied Technology

BOOK OF ABSTRACTS

Organized by



Foreword

In an era defined by unprecedented environmental challenges, it is imperative that we harness the power of knowledge, innovation, and collaboration to ensure the sustainable management of our planet's invaluable natural resources. The 3rd International Seminar of Science and Applied Technology, under the theme "Natural Resources Management and Sustainable Innovation," serves as a beacon of hope and a platform for change, encompassing a wide array of disciplines.

This seminar, taking place on October 24th, 2023, at the Campus of Politeknik Negeri Bandung (Polban), West Java Province, Indonesia, seeks to delve deep into the intricate web of natural resources and environmental sustainability. We recognize the significance of a multidisciplinary approach, and thus, we invite professors, researchers, students, and professionals from a diverse range of fields including soil sciences, hydrology, geology, geography, energy engineering (production, distribution, and storage), renewable energy, sustainable development, natural resources management, and materials science.

The concept of sustainable innovation lies at the heart of this event, revolving around finding solutions that meet the immediate needs of society without compromising the well-being of future generations or the delicate balance of our ecosystems. It's a unique opportunity to explore the latest research findings, exchange ideas, and collaborate across disciplines. Artificial intelligence, renewable energy technologies, conservation strategies, eco-friendly materials, and other cutting-edge advancements are the tools that enable us to create more efficient, cost-effective, and environmentally friendly solutions. They help us reduce waste, conserve resources, and mitigate the impact of climate change.

By participating in this seminar, you will engage with experts, foster new connections, and discover potential collaborations that can propel us toward a greener, more sustainable future. Together, we can navigate the challenges of today and build a brighter, more sustainable tomorrow, where environmental harmony and human prosperity coexist.

Join us in shaping a world where the boundaries between soil sciences, hydrology, geology, geography, energy engineering, renewable energy, sustainable development, natural resources management, and materials science converge for a common goal - a sustainable and thriving planet.

Sincerely,
Dr. Atmy Verani Rouly Sihombing, S.T., M.T
Chairperson, 3rd International Seminar of Science and Applied Technology
Politeknik Negeri Bandung (Polban), Indonesia

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Rundown 3rd ISSAT 2023

Time (GMT+7)	Event	Venue
Tuesday, 24 October 2023		
07.00 – 08.30	Registration	Pendopo Tonny Soewandito
08.30 – 09.00	Opening Ceremony <ul style="list-style-type: none"> • Chairman of ISSAT 2023 • Director • MoU Politeknik Negeri Bandung and Politeknik Kuching Sarawak Malaysia • Polban Press Launching 	Politeknik Negeri Bandung
Plenary Session		
09.00 – 09.45	Keynote I. Prof. Yean-Der Kuan NCUT, Taiwan	Moderator: Annisa Syafitri Kurniasetiawati, S.ST., M.Sc
09.45 – 10.30	Keynote II. Prof. Andriyanto Setyawan Politeknik Negeri Bandung, Indonesia	
10.30 – 11.15	Keynote III. Dr. Nur Zakiah Hani bt Dato' Dr. Kamarolzaman Politeknik Kuching Sarawak, Malaysia	
11.15 - 12.00	Discussion	
12.00 – 13.00	Break	
13.00 – 16.30	Parallel Session and Exhibition	Building H Polban (3 rd and 4 th Floor)
16.30 – 17.00	Best Presenter and Closing	Pendopo Tonny Soewandito

Rundown 3rd ISSAT 2023: PARALLEL SESSION

Tuesday, 24 October 2023, 13:00 – 16.00 (GMT+7)

Room 1. Geology and Geography (9 articles)	
Moderator: Imam Santoso, M.Sc (BRIN)	
ID	Article
ABS-29	Establishment of Control Points Using GNSS-RTK Technique
ABS-53	Conceptual Model of Hydrogeology Condition Around Tambakboyo Artificial Lake in Sleman Regency, Yogyakarta
ABS-58	Application of DRASTIC Method to Identify the Groundwater Vulnerability to Pollution in The Sub-District of West Limboto and Limboto, Gorontalo Regency, Indonesia
ABS-59	Investigation of Hydrogeology Condition in Manikin Dam Diversion Tunnel, Timor Island, Indonesia: A Case Study
ABS-67	State Transition Matrix and Markov-Chain Diagram for Frequent Volcanic Eruptions: Krakatoa, Indonesia
ABS-86	Recommendation of Excavation Method and Support System Based on Engineering Geology at Riam Kiwa Dam Diversion Tunnel, South Kalimantan, Indonesia
ABS-87	Hydrogeological and Hydrochemical Condition in Planned Tunnel B Route of The Yogyakarta-Bawen Toll Road
ABS-114	Geophysical Investigation of the 2022 Cianjur Earthquake: Uncovering A New Active Fault
ABS-123	Hydrogeological Conceptual Model in The Batang Integrated Industrial Park, Central Java, Indonesia

Room 2. Hydrology and Natural Resources Management (8 articles)
Moderator: Dr. Enung, S.T., M.Eng (Polban)

ID	Article
ABS-19	Effect of Different Fertilizers on The Growth of Duckweed (Lemna Minor) As Aquatic Plant Resources Utilization in Sustaining Red Tilapia (Oreochromis Niloticus) Culture
ABS-50	The Effect of Paving Block from Plastic Waste Material in The Urban Drainage: Study Case in Residential Areas
ABS-54	Flood Risk Assessment of Kemang Area as A Central Bussiness in South Jakarta
ABS-62	Risk Analysis of Debris and Non-Debris Flow in The Cisokan River Flood Event
ABS-88	Effect of Particle Size Variation in Water Hyacinth as An Additional Substrate in The Anaerobic Process for Urban Leachate Treatment
ABS-94	Assessment of Rainwater Harvesting Potential Based on Field Observations in Jagakarsa District Area, South Jakarta
ABS-110	Determination of Critical Slope and Optimal Safety Factor for Zonal Embankment Dams
ABS-121	Structure Planning of 13470 Dwt Capacity Jetty on Liquid Berth Ii Caspian Sea, Turkmenistan

Room 3. Soil Sciences (8 articles)
Moderator: Dr. Dewi Amalia, S.T., M.T. (Polban)

ID	Article
ABS-21	The Effect of Lime and Phosphoric Acid on The CBR Value of Soft Soil Based on Curing Time
ABS-42	Optimization of the Atterberg Limit on Expansive Soil Stabilized with Chitosan Biopolymer
ABS-44	Microtexture, Structure of Expansive Soil Elements and Components in Kadipaten, Majalengka
ABS-51	Comparison of the Effectiveness of Micromaterials and Nanomaterials of Lime as A Stabilizing Agent for Expansive Soils on The Value of The Plasticity Index
ABS-60	Parametric Study of Soil Nailing on Slope Stability using a Numerical Approach: Case Study of Slides in Cimanggung District, Sumedang Regency
ABS-61	The Effect of Adding Biopolymers on The Physical Properties of Peat Soils
ABS-66	The Effect of Waste Marble Powder and Phosphoric Acid on The Shear Angle and Cohesion Value of Expansive Soils
ABS-101	Accelerating Fiber Decomposition Process by Pseudomonas Taiwanensis Bacteria and Its Impact on The Physical Properties and Shear Strength of Fibrous Peat Soil in Palangkaraya

Room 4. Renewable Energy (11 articles)

Moderator: Parisya Premiera Rosulindo, S.S.T., M.SCIc

ID	Article
ABS-26	Reliability, Maintainability and Availability Analysis of Solar Power Plant in Pantai Baru using Voltage Measurement Data
ABS-47	Experimental Study of Superheat Degree Effects in A Small Organic Rankine Cycle Utilizing a Scroll Expander
ABS-49	Feasibility and Performance Analysis of Utilizing Spent Mushroom Substrate as Biomass Fuel
ABS-52	Influence of Thermal Aging on Dielectric Characteristics of Transformer Insulating Oils
ABS-81	Power Factor Improvement Utilizing Resources of Renewable Energy
ABS-82	Development and Design of Soybean Skin Separator Device Container in Rumah Tempe Indonesia, Bogor using Reverse Engineering and Redesign Methodology
ABS-84	Extraction of Chrysanthemum Oil to Produce Organic Insect Repellent
ABS-89	Automatic Air Quality Control Monitoring System in Building Services
ABS-106	Effect Variation of Aluminum Hot-Dipping Time and Temperature on Hardness, Roughness and Thickness on AISI 1045
ABS-120	Design and Manufacturing of a Laboratory Scale Concrete Roof Tile Dryer
ABS-122	Performance Comparison of DME and R134a Refrigerants in A Room Air Conditioner: Effect of Subcool and Superheat

Room 5. Energy Engineering (10 articles)

Moderator: Muhammad Akmal, S.T., M.T. (Polban)

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ABS-17	Relay Demonstration on Board
ABS-36	Numerical Study for Effect of Injection Parameters on Reservoir: A Case Study for Lahendong, Indonesia
ABS-46	Performance Comparison of Transcritical Cycle and Organic Rankine Cycle Coupled with Chingshui Geothermal Reservoir
ABS-75	Power Factor Correction of Three-Phase Electrical Power Supply by using of Thyristor Controlled Reactor VAR Compensator
ABS-76	Effect of Voltage Supply Unbalance on Temperature Distribution of Three-Phase Induction Motor
ABS-77	Fabrication of the Mini Multi-Function Pepper Machine
ABS-92	Design of Battery Energy Storage System (Bess) with Fuzzy Supervisory Control for Pico Hydro Power Plant
ABS-95	Experimental Analysis of Transformer Efficiency in Relation to Load Resistance
ABS-104	Estimation of Coal Production Target Based on Achievement of Monthly Stripping Ratio
ABS-112	The Test Bench for Simulation Impact of Core Saturation on The Current Transformer on Coordination of Inverse Relay Protection

Room 6. Sustainable Development (9 articles)

Moderator: Cholid Fauzi, S.T., M.T. (Polban)

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ABS-11	A Development of Mobile Application Satellite Link Budget Calculator – SATELEC
ABS-12	Enhancing Course Management and Student Monitoring Through The Mystudentstatus: A User Perception Study
ABS-13	Effectiveness of using Myintelligentbuzzlamp in The Teaching and Learning Process
ABS-14	Web-Based Development Of HEPAS
ABS-22	Raspberry Pi-Based Home Security Monitoring System
ABS-27	Embedding Bluetooth into Green IOT for Sustainable Smart Living
ABS-28	The Development of E-Equation Easy System (3E System)
ABS-79	EDFA With Power Pump Laser in WDM Network Design of 10GBPS Transmission
ABS-85	Automatic Solar-Based Pet Food Dispenser System

Room 7. Sustainable Development (10 articles)

Moderator: Ts.Aidawati Binti Mustapha (Politeknik Kuching Sarawak, Malaysia)

ID	Article
ABS-02	Implementation Digital Twin Technology for Bridge Inspection using Terrestrial Laser Scanner
ABS-09	Deep Reinforcement Learning in Agricultural IoT-Based: A Review
ABS-16	Precise Sensors in Detecting Stress in Workers in The Industry: A Review
ABS-20	Multifunctional Tiling Defect Detector Tool
ABS-23	Search And Rescue (SAR) Flight Simulations Utilizing Quadcopter and Image Processing Technology
ABS-64	A CASE Environment for Project-Based Course to Learn a Sustainable Software Development
ABS-69	Fish Fry Counter Based on Digital Image Processing Method
ABS-71	Design and Implementation Digital System Module for Vocational Education Studies
ABS-83	Location Prediction using Forward Geocoding for Urban Fire Incident
ABS-96	Practical Electronic Maintenance and Repair Technique to Support Sustainability Development

Room 8. Sustainable Development (12 articles)

Moderator: Dr. Agah Muhammad Mulyadi, S.T.,M.T (Government)

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ABS-07	Pavement Maintenance Strategy for Provincial Roads in Tarakan City, North Kalimantan
ABS-33	Comparison of Road Damage Analysis using PCI Method and Bina Marga Method and The Analysis of Road Improvement Methods using The Road Pavement Design Manual (Case Study: Citayam - Parung Road)
ABS-35	Comparative Analysis of Spectral and Deterministic Methods for Estimating Fatigue Life in Joint of Fixed Jacket Platform in The Andaman Sea Myanmar
ABS-39	Comparative Study of the use of OPC, PCC, and HC Cement Types on High Quality Concrete with Self Compaction System
ABS-40	Comparison of Types of Grouting to Guarantee Zero Tendon Slip with Posttension System Prestressed Concrete Bridge Anchors
ABS-45	Utilization of Nickel Slag as A Substitute for Aggregate in Asphalt Concrete Binder Course
ABS-55	Glycerine Pitch as A Partial Replacement of Pen 60/70 In AC-WC Mixture
ABS-56	Critical Examination of Multi- Lane Free Flow Tolling System Implementation in Indonesia
ABS-91	The Effect of Addition of Low-Density Polyethylene (LDPE) on Cracking and Durability of Asphalt AC-WC Mixture
ABS-97	Experiments in Development of Porus Concrete as An Environmentally Friendly Alternative of Road Pavement
ABS-99	Environmental Implications of Styrofoam Waste and its Utilization as Lightweight Fill Material for Enhanced Embankment Construction Performance
ABS-100	Utilizing 3D Printing for Geomembrane Fabrication in Laboratory-Scale Geotechnical Testing

Room 9. Material Science (10 articles)

Moderator: Ir. Herawati Budiastuti, M.Eng., Sc., Ph.D.

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ABS-25	Alginate Encapsulation Technology of Bacteria for Promising Self-Healing Concrete
ABS-32	The Comparative Study of Epoxy and Bacterial Injection on The Flexural Strength in Cracked Concrete Beams: A Potential Approach using Bacillus Megaterium
ABS-65	Carbonization of Rice Husk for Adsorption of Phosphate Compounds: Influence of Temperature and NaOH Activator
ABS-78	The Effect of Tanduk Banana Peel Waste Concentration in Fermentation Process to Produce Ethanol by SSF And SHF Methods
ABS-102	Effect Variation of Solution Concentration and Voltage on Nickel-Chrom Electroplating At 7075 Aluminum Alloy
ABS-105	The Effect of Using Biopolymers as Encapsulation Material in Self-Healing Concrete on Tensile Strength
ABS-107	Catalytic Conversion of Glycerol to Formic Acid under Mild Condition Over an Iron-Based Catalytic System
ABS-108	The Effect of Drying Air Flow Rate in The Drying Process of Daun Telang (Clitoria Ternatea) Using Tray Dyere Just Try to Submit This Sample Abstract
ABS-109	Effect of The Addition of Nanoscale Cellulose Fibres from Bagasse on The Characteristics of Biofoam from Avocado Seed Starch

Room 10. Sustainable Development (11 articles)

Moderator: Ira Siti Sarah, S.S.T., MBA

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ABS-05	Determinants of MSME Financing in Islamic Banks in Indonesia for Sustainable Development
ABS-08	Quantifying Tourist Contributions: Assessing The Impact of Domestic and Foreign Visitors on Bandung's Hotel Tax Income Growth
ABS-10	Sustainability Reporting Quality of Indonesia-Malaysia Oil & Gas Companies: The Role of The Board and Chairman CEO Characteristics
ABS-15	The Role of Islamic Banking Financial Intermediation on Indonesia's Economic Growth
ABS-18	Effectiveness of Industrial Training Among Politeknik Kuching Sarawak Students During Covid 19 Pandemic
ABS-41	The Influence of CSR And Environmental Performance on Profitability
ABS-48	Developing Food Security with Sustainable Agricultural Land Policies: A Systematic Review
ABS-63	The Determinants Factors of Firm Value
ABS-72	Productivity Analysis and Technical Efficiency of Sweet Corn
ABS-80	SME'S Household Work Time in Sawahlunto City West Sumatera Indonesia
ABS-111	Sustainable Development in Halal Tourism Industry: The Role of Innovation and Environment Concern

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ABS-02

Implementation Digital Twin Technology for Bridge Inspection using Terrestrial Laser Scanner

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This study aims to determine the type of damage, dimensions (extent and depth) of damage, determine the level of damage, and determine the remaining value of bridge capacity. Data acquisition was carried out scanning the bridge built since 1984 using TLS so that a real and accurate 3D model of the bridge was obtained. The model is used for bridge inspection, making As-built drawings, and making recommendations for bridge repair and maintenance. The inspection carried out is a type of detailed inspection in accordance with Guideline No.01/P/BM/2022 concerning Bridge Inspection. In addition, the remaining capacity value of the bridge was also determined using the rating factor method based on Guideline No. 024/BM/2011 on Determining the Remaining Capacity Value of the Bridge. The inspection results show that the bridge is in a moderately damaged condition, requiring monitoring or maintenance. The rating factor values of the moment and shear of the edge section are 0.71 and 6.33 respectively while in the middle section they are 0.44 and 3.39 respectively, which means that the bridge is not safe against the moment due to the maximum live load. While on the floor slab, the moment and shear rating factor values are 0.37 and 0.84 respectively, meaning that it is not safe against moments and shears due to dead loads and traffic loads. The use of TLS greatly assists the bridge detail inspection process and makes it easier for inspectors to see the visual condition of the bridge that cannot be seen manually.

Keywords: Terrestrial Laser Scanner, Rating Factor, Bridge Inspection

ABS-05

Determinants of MSME Financing in Islamic Banks in Indonesia for Sustainable Development

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MSME is an economic sector that has a real impact on sustainable development through its role in economic growth, job creation, improving income distribution and reducing poverty. Efforts to encourage the role of MSMEs are constrained by business continuity and limited funds from financial institutions. The growth of MSMEs is hampered by complicated processes, collateral that is not easy to fulfill and the low amount of financing from banks. Islamic bank financing in the MSME sector is still low, tends to decline, has not yet reached the minimum regulations and is of lower quality than financing in other sectors. This study aims to examine the determinants and policies to encourage the optimal role of Islamic bank financing in the MSME sector to support the process of sustainable development. The research was conducted using a multiple regression analysis model with the Ordinary Least Square (OLS) estimation method, using time series data, monthly period 2016-2022. The results showed that the capital, risks and profits of Islamic banks (internal factors) as well as economic growth and monetary policy interest rates (external factors) had a significant effect on Islamic bank financing in the MSME sector. Efforts to encourage an increase in MSME financing for Islamic banks can be carried out by optimally managing capital and financing risks so as to encourage the achievement of maximum profits. Islamic banks can take advantage of the momentum of monetary policy and economic growth in order to encourage profit growth and MSME financing to support the achievement of sustainable development.

Keywords: Financing, MSMEs, Islamic Banks, Sustainable Development

ABS-06

Disclosure of CO2 Emissions, Community Complaints, Occupational Safety, and Its Relation to Financial Distress

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The Indonesian government is committed to resolving emission issues through the development of green industries. The government encourages industries to transform into sustainable industries that are environmentally friendly. The Indonesian government asks the public and the market to put pressure on the industry to improve its environmental performance. The public can monitor and pressure companies through disclosure of environmental performance information such as disclosure of CO2 emissions. In addition to environmental performance, disclosure of corporate social performance is no less important. Social performance relates to the company's responsibility towards employees (work accidents) and the surrounding community (community complaints). The risk of companies that have poor environmental performance and social performance can result in the company experiencing financial distress. This study aims to examine the effect of disclosure of CO2 emissions, community complaints and work safety on Financial Distress. Financial Distress is measured using Altman Z Score and operational cash flow adequacy. This study uses age and company size as control variables. The sample of this study is manufacturing companies listed on the Indonesia Stock Exchange from 2018-2021. This study uses the Common Effect Model (CEM) and Random Effect Model (REM).

Keywords: disclosure of CO2 emissions, disclosure of community complaints, disclosure of work safety financial distress

ABS-07**Pavement Maintenance Strategy for Provincial Roads in Tarakan City, North Kalimantan**

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Tarakan City has several road segments on provincial roads that have experienced significant damage in the form of sinkholes and substantial potholes on the road surface. The deteriorated or potholed road conditions are attributed to factors such as traffic impact, traffic loads, inadequate subgrade soil conditions, and pavement materials not meeting the intended specifications. To formulate road repair plans, field data collection is essential. Two methods for data collection are employed to determine pavement conditions: the International Roughness Index (IRI) and the Surface Distress Index (SDI). The parameters measured using the IRI method are road smoothness values using the Roughmeter III instrument, while the SDI method employs measurements of crack area, crack width, pothole count, and wheel path rut depth. The surveyed road sections include Amal Lama, Gunung Selatan, Aji Iskandar, Bhayangkara, Aki Pingka, and the Ring Road of Tarakan City. The research findings indicate the surface damage level of roads in Tarakan City using the SDI and IRI methods as follows: good condition 42.86%, moderate condition 51.90%, slightly damaged condition 4.8%, and heavily damaged condition 0.44%. Moreover, the study has determined the percentage lengths of each type of maintenance: Routine Maintenance 94.77%, Periodic Maintenance 4.8%, and Reconstruction 0.44%

Keywords: Pavement Evaluation, Surface Distress Index (SDI), International Roughness Index (IRI)

ABS-08

Quantifying Tourist Contributions: Assessing the Impact of Domestic and Foreign Visitors on Bandung's Hotel Tax Income Growth

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The city of Bandung, situated in West Java, Indonesia, is a prominent tourist destination. Its combination of physical and cultural attributes makes it an appealing choice for both local and international travelers. The influx of tourists, whether domestic or foreign, holds the potential to enhance the city's financial prospects, particularly through hotel taxes. This study delves into the correlation between domestic and foreign tourist visits and the escalation of hotel tax revenue in Bandung. The goal is to derive a formula that can effectively optimize hotel tax earnings in the city. Employing descriptive and causal methodologies alongside a quantitative approach, the research relies on secondary data spanning 2004 to 2021 and employs multiple linear regression for data analysis. The findings demonstrate a positive correlation between foreign tourist visits and the growth of hotel tax revenue, underscoring how an increase in foreign tourists corresponds to heightened tax earnings. Conversely, the research reveals a negative impact of domestic tourist visits on the expansion of hotel tax revenues.

Keywords: domestic tourists- foreign tourists- hotel tax- Bandung

ABS-09

Deep Reinforcement Learning in Agricultural IoT-Based: A Review

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The world's food needs have an impact on innovation in the field of agriculture, and one of them is by implementing deep reinforcement learning (DRL) technology, which is very relevant to the Industrial Revolution 4.0. This research discusses important issues and developments in DRLs that are implemented, especially in the field of IoT-based agriculture. The research method uses a Systematic Literature Review (SLR) approach through searching and analyzing raw data sources, sorting and selecting relevant data relevant to the topics discussed, discussing topic areas and how trends are in current conditions, and concluding. The purpose of this study is to see how the current state of DRL implementation in agricultural IoT-based. The limitations of the study are that (1) the data sources come from Scopus-indexed journals (2) the journal period is 2021-2023 (3) the research approach uses SLR and (4) the focus of the discussion includes the implementation of DRL in agricultural IoT-based systems, the development of DRL technology, and the use of tools in DRL.

Keywords: Deep reinforcement learning- machine learning- DRL

ABS-10

Sustainability Reporting Quality of Indonesia-Malaysia Oil & Gas Companies: The Role of The Board and Chairman CEO Characteristics

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Currently, reporting sustainability-related activities is an obligation and even a necessity for companies, especially companies with high levels of socio-environmental destruction. This study examines the role of board and chief executive officers in improving the quality of sustainability reporting of Oil & Gas companies in Indonesia and Malaysia. The sample is 18 companies during the period 2012-2022 that form an unbalance panel of data with a total observation of 178 companies-years. The results of the random effect model estimate show that the size of the board, independent board, and CEO chairman with longer tenure plays an important role in improving the quality of corporate sustainability reporting. Meanwhile, the female board and the age of the CEO chairman do not play a role in improving the quality of corporate sustainability reporting. This study fills the literature gap in the relationship between board and CEO chairman characteristics with the quality of Oil & Gas corporate sustainability reporting, particularly for the Indonesian and Malaysian contexts. In addition, it adds understanding and insight for practitioners.

Keywords: Board characteristics, CEO chairman characteristics, corporate sustainability reporting, Oil & Gas, Indonesia and Malaysia.

ABS-11

A Development of Mobile Application Satellite Link Budget Calculator - SATELEC

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Link Budget is a calculation of gains and losses during transmission from transmitter to receiver in each communication system. In satellite communication, the main purpose of calculating link budget is to analyse the satellite system performance. One of the parameters to measure the satellite link performance is the Carrier to Noise ratio (C/N). There are a few satellite link calculators were developed using MATLAB/GUI and website. However, there are no available apps to help student to compare the calculated satellite link budget calculator for self-study. Therefore, a mobile apps called SATELEC was developed to calculate satellite link budget parameters. By using this satellite link budget calculator apps, all parameters such as Effective Isotropic Radiated Power (EIRP), Power Flux Density, Path Loss, Antenna Gain and Power Received can be calculated. After the value of power received is obtained, the value of Carrier to Noise ratio (C/N) can be determined by taking into account the noise in the communication. Results shows values obtained from the mobile is reliable after comparison with calculated value.

Keywords: Link Budget, Satellite, Apps, Calculator

ABS-12

Enhancing Course Management and Student Monitoring Through the myStudentStatus: A User Perception Study

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MyStudentStatus(mySS) is a system for tracking student course status that has been developed to address challenges faced by academic advisors in managing and monitoring student progress. This system provides academic advisors with comprehensive information about students' final examination results and their performance in each course they have taken. It enables quick and accurate monitoring of students' academic progress, including their course status, grades, prerequisite preparation, and overall academic performance. This includes identifying students at risk of falling behind or missing out on a particular course. Overall, myStudentStatus greatly assists in enhancing the productivity of academic advisors, reducing errors, and indirectly improving student support services. By utilizing technology to streamline administrative processes, myStudentStatus contributes to a more efficient and effective education system that benefits both academic advisors and students.

Keywords: student- course status- academic

ABS-13

Effectiveness of Using myIntelligentBuzzlamp in the Teaching and Learning Process

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MyIntelligent Buzzlamp is a teaching aid tool designed to assist students during practical sessions for examining vehicle electrical systems. This tool facilitates the examination process by providing light and audible beeps as indications of fuse status. This examination process is crucial when issues arise, such as non-functional audio systems or vehicle electronic components. Visual impairment, especially among older mechanics or those facing glare-related problems, as well as difficulties in using a multimeter for examination, are challenges addressed by this innovation. The use of this tool is highly straightforward, where students only need to connect the alligator clip to the battery terminal and touch the tip of the innovation to the fuse terminal. If the fuse is functional and in good condition, the tool will light up and emit a beeping sound. In conclusion, this innovation has succeeded in assisting students in carrying out practical tasks more easily and effectively, conserving labor and space, and reducing the duration of execution.

Keywords: fuse-examining-student

ABS-14

Web-Based Development of HEPAS

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Politeknik Kuching Sarawak

The HEPAS (HEP Application Letter Approval System) system was developed to make it easier for HEP (Student Affairs) to generate approval letters more effectively and efficiently. This system was developed because there are often dropouts in processing confirmation letters submitted by Polytechnic Kuching Sarawak students. The HEPAS system is a web-based system and has been developed using PHP, HTML, CSS and javascript programming languages. The development of this system also involves XAMPP as a server and PHPMYAdmin as a database used to store all the data sent through the HEPAS system. Application for a confirmation letter by students through the HEPAS system will be sent to the system administrator which is HEP for the process of generating the confirmation letter. With this system in place, it can help HEP to manage confirmation letter applications more effectively and efficiently, thereby increasing HEP's productivity in managing students.

Keywords: letter, generate, confirmation

ABS-15

The Role of Islamic Banking Financial Intermediation on Indonesias Economic Growth

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This study attempts to examine the relationship between deposits, disbursed financing, number of bank offices, and economic growth before and during the COVID-19 crisis. This study uses time series data of Indonesian Islamic banking for the period from the first quarter of 2009 to the third quarter of 2022, estimated using Auto Regressive Distributed Lag (ARDL). Deposits and disbursed financing respectively are the ratio of total deposits and total disbursed financing to nominal GDP. Economic growth is measured using Indonesia's real GDP growth on the basis of 2010 constant prices. The results show that in the long run, deposits have a very significant positive effect on economic growth. Meanwhile, financing and the number of bank offices have no effect on economic growth. In the short term, except for the number of bank offices, real GDP, deposits, and financing contribute to the adjustment of changes in real GDP towards long-term balance, which takes approximately seven quarters. This study fills a gap in the literature on the role of Islamic banking on economic growth. This study also adds a new view of the role of Islamic banking in economic growth during the COVID-19 crisis. This study provides an important contribution to policy makers and other stakeholders, particularly in the developing country, Indonesia. However, future studies will need to add some control variables to the model, such as gross fixed capital formation, government spending, inflation, and economic openness. This study is one of the pioneers that includes crisis variables in the ARDL model. In the context of financial development, especially Islamic banking, deposits show a significant positive influence on economic growth in Indonesia.

Keywords: Deposits- Funding disbursed- Number of bank offices- Economic growth- COVID-19

ABS-16

Precise Sensors in Detecting Stress in Workers in The Industry: A Review

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Stress in the work environment has an impact on worker welfare and industrial productivity. This paper reviews the use of precision sensors in detecting workers' physiological responses to stress in industry. The focus is on sensors that measure heart rate, sweat rate, body temperature, muscle activity and sleep patterns. The wearable sensor is the main highlight. Despite implementation challenges, precision sensors offer the potential for real-time monitoring to create healthier and more productive work environments.

Keywords: Precision Sensors, Workplace Stress, Industry, Worker Health Monitoring, Wearable Technology

ABS-17

Relay Demonstration on Board

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The present invention relates to a relay demonstration board, characterized by a microcontroller, a plurality of relays are connected to the microcontroller by a plurality of switches, wherein the first relay is connected to a light bulb for controlling the lighting of the bulb and the second and third relay are connected to a DC motor for controlling the rotational direction of the motor. Accordingly, these objectives may be achieved by following the teachings of the present invention. The circuits gets opened and closed by the relay switches electromechanically. There is controlling of single electric circuit through opening and closing the contacts in a different circuit. However, when the relay contact is NC, Normally Closed, there get be open contact of not reenergizing the relay. Either way, application of electric current may change with the state to the contacts. Generally, the relay gets used to lesser small currents in managing circuit and no power control taking over devices apart from the small motors with Solenoids that drawing limited amps. Relays might manage bigger voltages with amperes through having the amplifying effect since the lesser voltage applied to the coil of relays might lead to huge voltage that the contacts switch. Defensive relays can protect instruments destruction through sensing electrical faculties like over current and under current. Additionally, relays are broadly used in switching the coils that start, elements of heating and perceptible alarms. In the circuit board, the relay applies electromagnetic sector the moment power obtains application to the coil, in a sequence that lead to the movement of armature as well as making contacts be it close or open.

Keywords: Relay, Electromagnetics

ABS-18

Effectiveness of Industrial Training Among Politeknik Kuching Sarawak Students During Covid 19 Pandemic

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In 2020 will be remembered as a turning point in human history as a result of the COVID-19 pandemic. We have been inundated with data on the progression of the pandemic and the number of illnesses and fatalities that have happened globally from the start of the year until the present. 555 million people have died, and 334 million people have been infected overall. Nearly all nations employ lockdowns or movement restrictions, as advised by WHO, to break the pandemic network. Malaysia has established a Movement Control Order (PKP) that will go into effect on March 18, 2020, thus it is not an exception. Every aspect of life may be impacted by its impact on society. This study discusses the reactions of Kuching Sarawak Polytechnic Industrial Training students to the COVID-19 outbreak. It's the end result of a quantitative study. Information acquired through online surveys with open-ended questions. A descriptive analysis of the data was conducted.

Keywords: COVID-19, Kuching Sarawak Polytechnic, Industrial Training

ABS-19

Effect of Different Fertilizers on The Growth of Duckweed (*Lemna minor*) As Aquatic Plant Resources Utilization in Sustaining Red Tilapia (*Oreochromis Niloticus*) Culture

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Kolej Komuniti Tampin

Duckweed (*Lemna minor*) is one of the smallest floating aquatic plants in the world. This plant is potentially important in the aquaculture feed industry since aquaculture feed is the major operational cost in fish production. This 37-day study was done to see the effect of different fertilizers- (goat manure, chicken manure and organic fertilizer) at the same concentration of 2g/L on duckweed growth. Tap water without fertilizer was used as a control. Water parameters such as pH, temperature, light intensity, nitrate, phosphate, and ammonia were observed. The result of duckweed growth rate after 37 days in goat manure fertilizer (0.66 grams/day) is the highest followed by chicken manure fertilizer (0.07833 grams/day), organic fertilizer (0.02567 grams/day) and the control (-0.00133 grams/day). The weight of the duckweed by using the goat manure fertilizer is higher which is 6.1333 grams, followed by chicken manure fertilizer (1.08 gr), organic fertilizer (0.70667 g) and control (0.19667 g). Treatment of goat manure fertilizer has a high concentration of nitrate 1.99 ppm, ammonia 2.69 ppm and available phosphate 7.71 ppm which suitability for duckweed growth. Since duckweed is easy to be cultured, this natural resource of aquatic plants can be produced commercially to be used as natural diet for Red Tilapia (*Oreochromis niloticus*) farming.

Keywords: Duckweed, Tilapia Feed, Aquatic Plant, Natural Resources

ABS-20

Multifunctional Tiling Defect Detector Tool

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Every year, the conventional tile inspection used by professional workers in the construction sector is seen to be another difficult problem in checking the density of the mortar. For the conventional method, tile inspection uses bare hands (knuckles), a coin, and a tapping rod. The selection of these three methods depends on the individual who inspects but it has a detrimental effect on the user because the user must stoop down to check the installed tile. Furthermore, it also takes a long time to check the tiles in one part, and depending on the size of the tiles if the size of the tiles is quite large then a long time will be needed to check the tiles. The Multifunctional Tiling Defect Detector Tools (MT2DT) are successfully produced to compare the traditional (conventional) method with MT2DT over some time and consumers' satisfaction with the Likert scales. As a result of this innovation project has been enhanced and changed to make it simpler for customers to do tile inspection work. With the use of this device, someone can identify tiles with less cement compression and save them from cracking in the future in less time compared to conventional tools. Besides, the MT2DT showed high satisfaction among consumers and could help them, particularly first-time homebuyers, identify flaws as soon as possible during the liability period.

Keywords: Tiling defect- conventional- innovation- homebuyers -inspection and satisfaction

ABS-21

The Effect of Lime and Phosphoric Acid on The CBR Value of Soft Soil Based on Curing Time

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The highway construction, both for flexible and rigid pavement, it is necessary to pay attention to the bearing capacity of the subgrade. Especially on soft clay soils. The method to determine the bearing capacity value is through CBR testing in the laboratory. Soft soil has a low bearing capacity, so it cannot accept the load acting on it, such as the soil in the Gedebage area of Bandung. Increasing the value of the bearing capacity, required to carry out soil improvement using the soil stabilization method. This study, stabilization materials such as lime with a percentage of 10% and 5% phosphoric acid will be used. Aims to increase the value of soil bearing capacity based on the results of laboratory CBR tests with 3-, 7-, and 14-days curing periods, as well as to find out the optimum curing period from these tests. Based on the test results obtained very positive results because it can increase the CBR soaked 0.8% and 3% unsoaked for soft soil to 5.6% for CBR soaked and 15.23% for CBR unsoaked on stabilized soil with a curing period of 14 days. As a result, these stabilization outcomes meet the minimum requirements for the road pavement subgrade.

Keywords: Soft_Soil, Lime, Phosphoric_acid, Stabilization, CBR

ABS-22

Raspberry Pi-Based Home Security Monitoring System

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The era of technology now open space to facilitate daily tasks. Security camera has nowadays become necessity at every expert for safety environment. Home monitoring systems can continuously monitor and send users notifications about the condition of their homes. A notification will be delivered immediately to the owner's Telegram account when the camera captures the person's face and enables the posting of live video of that moment. It enables for user to records the incidents that happen to their home. The purpose of developing the telegram application is mainly to owner via Android application because nowadays society are more using mobile technology. People who frequently leave their home to travel abroad or stay up late at work are the target audience for this initiative. The result of developing this application is it is expected to reduce incident robbery or broke the house and it provide safety environment to users. The movement of people and animals can be tracked by this system using a PIR-based motion detector, however the wind cannot be picked up.

Keywords: IoT, monitoring, Raspberry, Telegram

ABS-23

Search and Rescue (SAR) Flight Simulations Utilizing Quadcopter and Image Processing Technology

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In Search and Rescue operations, designated search areas are explored by aircraft and helicopters. Upon target identification, the aerial platform proceeds with the landing and rescue procedure. This research employs a quadcopter to replicate SAR flight scenarios. The quadcopter's autonomous operation encompasses take-off and navigation between waypoints as dictated by the Mission Planner. En route to the second waypoint, a camera-based image processing system scans the ground. Detection of a ground marker activates the Raspberry Pi program, instructing the flight controller to ensure precise landing directly over the recognized marker. In cases where the quadcopter reaches the second waypoint, but the system fails to identify a ground marker, the programmed response involves the quadcopter autonomously returning to the initial waypoint, where it executes a self-guided landing at its take-off location. A captivating aspect of this investigation concerns the efficacy of a cost-effective 5 Megapixel camera, with a 1280x720 pixel frame, in accurately identifying landing markers. The study parameters encompass marker diameter, flight altitude, and quadcopter speed. Outcomes demonstrate successful marker detection at flight altitudes up to 3 meters above ground, achieving a top speed of 3 meter per second at a 2-meter height. The smallest identifiable marker diameter remains at 40 cm.

Keywords: quadcopter, image processing, SAR flight simulations

ABS-25

Alginate Encapsulation Technology of Bacteria for Promising Self-Healing Concrete

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Concrete is a material that is often used in construction in Indonesia. Concrete has the disadvantage that it tends to form cracks. The cracks that form start from small cracks and then enlarge, causing a decrease in quality. Self-healing concrete is a type of concrete that could repair itself with the help of healing agents in the form of bacteria. There are several methods of mixing bacteria into concrete, one of which is by mixing bacteria directly or using a shell which is often called encapsulation. The purpose of this study was to analyze the behavior of the addition of *Bacillus Megaterium* bacterial encapsulation in terms of compressive strength of concrete with encapsulation proportions of 0%, 2% and 4% by volume weight and using alginate-based shells. The samples used were 15 x 30 cm cylindrical specimens. These specimens were then tested after 7 days and 28 days. In this study, the bacteria were encapsulated in alginate-based materials leading to a new concept-self-healing.

Keywords: Self-Healing Concrete- Encapsulation- *Bacillus Megaterium*- Alginate

ABS-26

Reliability, Maintainability and Availability Analysis of Solar Power Plant in Pantai Baru using Voltage Measurement Data

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Indonesia is a country with great potential to develop solar power plants. The hybrid power plant in Pantai Baru, Yogyakarta is one of the applications of existing solar power plants in Indonesia. Analysis of reliability, maintenance, and availability is needed to minimize problems in the electrical energy production process at the solar power plant so that renewable energy security and sustainability can be maintained. An easy-to-use method of analyzing reliability, maintainability, and availability is through control charts. This study aims to determine the reliability, maintainability, and availability of solar panels with a capacity of 48 Volts at the hybrid power plant, Pantai Baru using the control chart method. Calculation of reliability, maintainability, and availability of solar panels is carried out using solar panel output voltage measurement data collected over the last 4 years. Time to failure, TTF and time to repair, TTR were obtained from out-of-scope data on the control chart and processed using software, namely Reliasoft Weibull ++ Version 6. The simulation results and calculations show that the distribution obtained from TTF and TTR is a three-parameter Weibull distribution, with a system reliability value of 0.3, maintainability value is 1 and availability value is 0.997 with a solar panel operating time period of 5 days. The reliability of each solar panel unit is 0.122 or 12.2%.

Keywords: availability, control chart, maintainability, reliability, energy security and sustainability, solar power plant

ABS-27

Embedding Bluetooth into Green IoT for Sustainable Smart Living

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The development of the Internet of Things and their integration in smart cities have changed the way society work and live. Green IoT evolves around by designing, leveraging, and enabling technology to support and achieve sustainable development. Hence, this study highlights on greening IoT towards a sustainable smart living. Main aim is to embed Bluetooth into Green IoT controlled device. This project in this study is named as Green IoT Bluetooth Hotmeal Container (GIoT-BHMC) which satisfies energy saving, cost effectivity, supports smart grids, smart industries as well as smart living. The idea is reheating food using Bluetooth technology and rechargeable AA batteries installed in a food container yet rejecting the use of electricity. Reheat process is controlled by mobile application developed in an android environment. Four phases allocated for this study consisting of planning for design, development of device with Bluetooth technology, integration, and testing phase and finally the implementation phase. User acceptance test was conducted too to ensure study findings meet users^ requirements. Study contributes to energy efficiency, sustainability on smart living and green metrics. To-date, GIoT plays crucial role in producing a better-off citizen. In specific, efficient resource utilization, sustainability, reducing energy consumption, pollution, and e-waste are the main idea of greening the technology. This study is a practical insight towards eco-friendly and sustainable city based on emerging GIoT technologies.

Keywords: Green IoT, Sustainability, Eco-friendly, Energy efficiency, GIoT-BHMC

ABS-28

The Development of E-Equation Easy System (3E System)

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E-Equation Easy System (3E System) is a web-based system created to solve simultaneous equation calculations using the Matrix method (Cramer Rule Method) which is faster and easier as an alternative to manual calculation methods. This application will be able to be used by lecturers and students, but the level and form of access are different to control the security of questions. This innovation project targets the following two objectives which are the first- to help lecturers in facilitating the preparation of theory and practical questions for students, and secondly, to reduce the calculation time required in providing accurate answers. In terms of the functionality of this innovation project, 3E System has been able to be used by students through an open user module and by lecturers through a registered user module. This application is also able to meet the calculation of solutions for two types of simultaneous equations, namely two variables and three variables, and it makes it easier for lecturers to get answer schemes and create simultaneous equation questions by just entering the values of the variables. The use of this application has indeed been able to help in solving the problems faced by lecturers in the implementation of the teaching and learning process. 3E system was developed using PHP as a chosen scripting language, MySQL as a database, Bootstrap as an open-source web user interface, Javascript and Cascading Style Sheets (CSS) are also attached with them. This system has also successfully gone through the testing phase and can be used online safely. This responsive system, can be accessible using a desktop or mobile phone, helps access from all over the world and can collect feedback from users regarding the level of satisfaction with the use of the system.

Keywords: Cramer's rule online calculator, Linear equations calculator

ABS-29

Establishment of Control Points Using GNSS-RTK Technique

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Nowadays, Global Navigation Satellite Systems (GNSS) methods are broadly utilized to determine positions of points. This study was conducted with the aim of determining the positioning of control points at Politeknik Kuching Sarawak Campus using GNSS-RTK Technique. For this purpose, twenty-four control points were established with an average baseline length between Base station and Rover less than 1 km were occupied with Topcon Hiper VR receivers for different time periods. In this study there are situation of positioning under satellite obstruction such as the control points situated in the near buildings. Multipath is a common challenge in GNSS-RTK especially in complex environments. The final result from the Horizontal and Height differences were determined and compared with those measured by both static and RTK surveys. The result of the study shows that GNSS-RTK positioning method ensure high accuracy GNSS position solution within few centimeters.

Keywords: GNSS-RTK, Obstruction, Control Points

ABS-32

The Comparative Study of Epoxy and Bacterial Injection on The Flexural Strength in Cracked Concrete Beams: A Potential Approach Using Bacillus Megaterium

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Cracks in concrete beams can significantly affect the performance of reinforced structures. To repair cracks in concrete, Traditional crack repair methods typically involve epoxy injection, but studies have suggested that epoxy may not fully restore the original strength. Therefore, concrete structure repair requires the development of new and more efficient materials. This study focuses on investigating the potential of *Bacillus megaterium*, a bacterium known for its self-healing properties in concrete. This bacterium has the capability to precipitate minerals like calcium carbonate, which can fill the cracks and increase the strength of concrete. Testing is carried out on reinforced concrete beams with existing cracks, sized at 100 mm x 100 mm x 500 mm. The specimens are divided into two groups, one repaired with epoxy injection and the other with bacterial injection, with varying additions of 10% and 15%. The research results show that the injection process with the addition of 15% bacteria is able to restore approximately 99.72% of the initial strength of the concrete beams. The results of this research contribute to the development of improved repair techniques that can restore the flexural strength of cracked concrete beams and extend the service life of concrete structures.

Keywords: Bacillus Megatrium, Epoxy, Flexural Strength, Crack, Injection

ABS-33

Comparison of Road Damage Analysis Using PCI Method and Bina Marga Method and The Analysis of Road Improvement Methods Using the Road Pavement Design Manual (Case Study: Citayam - Parung Road)

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The Citayam - Parung road section is a crossroad between districts and cities between Bogor Regency and Depok City, West Java, on this road section there is high mobility. The aim of this research to determine the type of road damage using the Pavement Condition Index (PCI) method and Bina Marga method and analyze repairs using the Pavement Design Manual (MDP) 2017 guidelines. The PCI method for determining pavement conditions and pavement quality classification with values from 0-100, while the Bina Marga Method for determining road priorities is in the order of priority values from 0- 9. Data collection was carried out by way of direct surveys and interviews with related agencies to obtain information and literature needed in this study. The results of the Citayam - Parung road damage analysis study show several types, namely alligator cracking, block cracking, edge cracking, longitudinal cracks, utility patches and excavation, polished aggregate, photoles and weathering and raveling. The results of the damage analysis by the PCI method have a value of 71.96 with Very Good, very good pavement quality and the results of the damage analysis by the Bina Marga method, the Citayam - Parung road section has a priority order of 10 with the routine maintenance program priority order. The relationship between the PCI method is directly proportional to the Bina Marga method, with a PCI value between 71-85 and the order of priority in Bina Marga is 10, the regression equation is $PCI = 207.52 - 13.296*(Bina\ Marga)$. Then for the non- structural overlay analysis with a thickness of 45 mm with an estimated cost of repair of Rp. 2,404,076,800.00 (including VAT) spelled out Two Billion Four Hundred Four Million Seventy-Six Thousand Eight Hundred Rupiah.

Keywords: Pavement Condition Index (PCI), Highways, Pavement Design Manual (MDP)

ABS-35

Comparative Analysis of Spectral and Deterministic Methods for Estimating Fatigue Life in Joint of Fixed Jacket Platform in The Andaman Sea Myanmar

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Cyclic wave loads can cause fatigue of the joints in the Jacket Platform structure, which is made of steel material and is prone to vibration resonance. This study compares the fatigue life of the Yetagun North Field (YET-D) jacket platform analyzed using the spectral and deterministic fatigue methods using the API RP-2A WSD standard and adding the Weld Improvement Technique 3D visual model and the analysis is processed using the Structure Analysis Computer System (SACS) Connect Edition v11.3 software. Fatigue analysis of Spectral Method without Weld Improvement Technique has exceeded the service life of 20 years, while some joints are less than the service life using the Deterministic Method, but after the Weld Improvement Technique using the S-N curve WJ3 the joint life increases to exceed its service life. Analysis of the fatigue life of Spectral and Deterministic Fatigue Method couplings based on the location of the elevation Joints with the same type of fatigue life will increase when approaching 0 m elevation from the seabed, but the Deterministic Method has a smaller life ratio than the Spectral Method.

Keywords: Jacket Platform, Spectral Fatigue, Deterministic Fatigue, S-N curve

ABS-36

Numerical Study for Effect of Injection Parameters on Reservoir: A Case Study for Lahendong, Indonesia

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A single-flash cycle of thermodynamic model coupled with a reservoir of numerical model has been developed through COMSOL Livelink module to investigate the effect of the mass flow rate and injection temperature on production temperature and net output power of the power cycle. The geothermal reservoir model was established by using a thermal-hydraulic-mechanical (THM) module in COMSOL Multiphysics. Moreover, the single-flash cycle of the thermodynamics model was constructed in MATLAB. The geothermal reservoir conditions of Lahendong, North Sulawesi, Indonesia was adopted to simulate the actual operation of geothermal power plants. The results revealed that the variation of mass flow rate and injection temperature had an impact on production temperature and net output power. With an increase of the mass flow rate, the production temperature was considerably decreased. However, the difference in production temperature between mass flow rates of 50 kg/s and 250 kg/s at 1st and 30th years were 0.23 K and 0.41 K, respectively. Additionally, the net output power differences were 16.204 MW and 15.349 MW, respectively. Finally, increasing the injection temperature correspondingly led to an increase in production temperature and net output power, even though the increment did not exceed 1 K and 0.002 MW, respectively.

Keywords: Geothermal, Lahendong Reservoir, Thermal-Hydraulic-Mechanical, Single-flash cycle

ABS-39**Comparative Study of The Use of OPC, PCC, and HC Cement Types on High Quality Concrete with Self Compaction System**

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One of the problems faced in the manufacture of high-strength concrete is the difficult workability, and the rising price of OPC and PCC cement. To overcome these problems, a self-compacting system is needed in concrete to make the workability easier to work with and the use of other types of cement besides OPC and PCC, such as the latest product HC, to reduce the cost of making high-strength concrete. The objective of this study was to compare the use of OPC, PCC and HC cement types in high strength concrete with self-compacting system, so as to overcome the high-quality problem more effectively. The manufacture and testing of test specimens were carried out at the PT Pionirbeton Industri Laboratory with the results of testing the compressive strength of OPC type cement at 955.93 kg/cm², the compressive strength of PCC cement concrete at 866.22 kg/cm², and the compressive strength of HC cement concrete at 885.83 kg/cm². It can be concluded that the use of OPC cement in concrete mixes will produce the strongest concrete among the other two types of cement.

Keywords: High Strength Concrete, OPC, PCC, HC

ABS-40

Comparison of Types of Grouting to Guarantee Zero Tendon Slip with Posttension System Prestressed Concrete Bridge Anchors

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Prestressed concrete is internal stresses of appropriate magnitude and distribution are given in such a way that the stresses caused by external loads are resisted to a desired level. The use of prestressed concrete is mostly applied in bridge construction, especially in the bridge girders. During the stressing girder process, grouting is carried out to prevent the anchor from slipping. The strength of the adhesion of the grouting material used determines the homogeneous nature and whether the prestressed concrete section next to it can meet the anchor load. If the bond strength does not meet the requirements, it will cause slippage in the anchors which will ultimately affect the strength of the prestressed concrete structure due to quite large prestress losses due to slippage. The method used is to test the adhesive strength of the strands that have been grouted with f.a.s. 1:3 using each grouting material such as PCC (Portland Composite Cement), PPC (Portland Pozzoland Cement), OPC (Ordinary Portland Cement) and Sika Grout 215 which is then compared with the grouting material that adheres best. The results obtained were Sika Grout 215 bond strength of 3.6629 MPa, PCC bond strength of 3.2986 MPa, PPC bond strength of 2.5743 MPa and OPC bond strength of 2.307MPa. So, the highest adhesive strength for grouting materials is Sika Grout 215 of 3.6629 MPa.

Keywords: Prestressed concrete, girder, grouting, construction

ABS-41

The Influence of CSR and Environmental Performance on Profitability

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This study aims to see the effect of CSR and environmental performance on company profitability. According to the Ministry of Environment and Forestry the compliance of the manufacturing sector in environmental management is still low. This research can provide insight regarding the importance of implementing CSR and Environmental consideration to protect the environment and company's social impacts. The methods used in this study is a quantitative approach using cross-sectional regression. The population used is a manufacturing company listed on the Indonesia Stock Exchange as many as 72 companies. The results shows that CSR has no effect on financial performance because companies cannot legitimize that their social responsibility is in accordance with the wishes of the community. On the other hand, environmental performance affects the company's profitability. This condition can be achieved because within the framework of legitimacy theory, the public considers that industrial waste processing carried out by the companies that are the sample in this study has a good impact on the company's environment, which in turn will increase competitive advantage and ultimately increase company profits.

Keywords: CSR, Proper- ROA

ABS-42

Optimization of The Atterberg Limit on Expansive Soil Stabilized with Chitosan Biopolymer

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Pavement deterioration can be caused by expansive road subgrade material. Swelling properties are one of the problems on expansive soils. The swelling properties can be decreased by stabilization using additives. The potential of using chitosan biopolymer for soil improvement is attractive due to environmental friendliness and sustainability. This research was conducted to determine the effect of chitosan biopolymer from shrimp shell waste on the Atterberg limits of expansive soil. This test can be used as an initial assessment of soil strength and stiffness parameters. The Atterberg limits test was carried out by mixing chitosan biopolymer with a ratio of 0.05% - 0.10% - 0.15% - and 0.20% to the dry weight of the expansive soil. The study's results showed that adding chitosan biopolymer with a ratio of 0.1% was the most effective in reducing the plasticity index by up to 67%. The use of chitosan biopolymer is also expected for soil pollution control and remediation.

Keywords: Expansive soil- Chitosan biopolymer- Atterberg limit- Plasticity index

ABS-44

Microtexture, Structure of Expansive Soil Elements and Components in Kadipaten, Majalengka

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One of the most expansive soils in Indonesia is on the Northern-Coast of Java Island with a total distribution area in Indonesia estimated at 10% of Indonesia's total land area. Expansive soil is still one of the main causes of damage to the structures above it. Expansive soil improvement has developed rapidly, but repairing errors are still common because physical properties are considered. One way to see the characterization of soil particles in detail is to observe the microtexture and soil-forming element through Scanning Electron Microscopy (SEM), X-Ray Diffraction (XRD), X-Ray Fluorescence (XRF), and Cation Exchange Capacity (CEC). From the result of this research, SEM testing indicates a pore structure ranging from 2,1 - 6,6-micron meter at 20-micron meter magnification. Regarding the XRD and XRF, the soil has a dominant structure of Al₂O₃ (25.1%) and SiO₂ (59.7%) which are dominated by montmorillonite mineral lattice structures. This content is a mineral constituent of expansive soils that easily absorbs water in wet conditions and easily releases water in dry conditions, so that the soil experiences swelling in a relatively short time. The CEC test showed cations were 26.60% and the anions were 73.39%.

Keywords: Expansive Soil- Microtexture- Scanning Electron Microscopy (SEM)- X-Ray Diffraction (XRD)- X-Ray Fluorescence (XRF)- Cation Exchange Capacity (CEC)

ABS-45

Utilization of Nickel Slag as A Substitute for Aggregate in Asphalt Concrete Binder Course

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Roads are land transportation facilities that play an important role in the development of an area's potential, one of which is economic growth. As a result, the existing transportation infrastructure can withstand the traffic loads that pass through it. The purpose of this study was to determine the effect of using nickel slag as a substitute for aggregate with nickel slag levels of 0%, 20%, and 60%. The characteristics of the mixed Marshall were in accordance with the general specifications of Bina Marga 2018 Division 6 for the type of Asphalt Concrete Binder Course (AC-BC) mixture at a slag content of 60% with an asphalt content of 5.5% with a stability value of 1087.84 kg. Based on the results of this study, it can be concluded that the use of nickel slag as a substitute for aggregate can be used as a road pavement material.

Keywords: Asphalt- Marshall- Nickel Slag

ABS-46**Performance Comparison of Transcritical Cycle and Organic Rankine Cycle Coupled with Chingshui Geothermal Reservoir**

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The Chingshui geothermal field stands out as the most significant geothermal field in Taiwan. Understanding the long-term performance of geothermal energy is crucial for its sustainable utilization. In the present study, a numerical model Chingshui reservoir based on geological conditions is developed by using a thermal-hydraulic-mechanical (THM) model in the COMSOL to investigate the effect of the depth of the production well on the different binary cycles. The thermodynamic cycles of two configurations, namely the organic Rankine cycle (ORC) and transcritical Rankine cycle (TRC), are established by using MATLAB and coupled with the Chingshui reservoir through the COMSOL Livelink module. The study focuses on the effect of different well depths on the cycle performance. The results show that the TRC system had a higher performance compared with ORC system at depth 2000 and 3000 meters about 67.07% and 18.53%, respectively.

Keywords: geothermal, binary performance, Chingshui reservoir

ABS-47**Experimental Study of Superheat Degree Effects in a Small Organic Rankine Cycle Utilizing a Scroll Expander**

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A micro-organic Rankine cycle (ORC) system utilizing R134a as the working fluid and a scroll expander has been developed. In this study, the effects of superheat degree on system performance were investigated by varying the evaporation temperature and refrigerant mass flow rate. The heat sources used in the ORC system were three different temperatures: 85°C, 95°C, and 105°C. The results indicate that the refrigerant mass flow rate increases with the rise in evaporation pressure, while superheat degree decreases. At a heat source temperature of 105°C, increasing the evaporation pressure from 1.2 MPa to 2 MPa leads to a reduction in the superheat degree from 47.81K to 33.20K. Moreover, higher superheat degree led to a reduction in the system power generation. The trend of net efficiency demonstrates that when superheat degree increases, the net efficiency first rises to a peak before declining. At heat source temperatures of 85°C, 95°C, and 105°C, the peak net efficiencies are 4.86%, 5.56%, and 5.87%, respectively, with corresponding superheat degree of 25.72K, 36.16K, and 38.15K.

Keywords: Experiment- Superheat degree- System performance

ABS-48

Developing Food Security with Sustainable Agricultural Land Policies: A Systematic Review

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This paper addresses pressing global challenges related to food security, climate change, and changing consumption patterns, emphasizing the critical role of the agricultural sector in balancing nutrition and environmental sustainability. Focusing on Indonesia, where agricultural land conversion is a concern, this study evaluates the implementation of Law No. 41/2009 on the Protection of Sustainable Food Agricultural Land (PSFAL). A systematic review of relevant literature from 2013-2023 through the PRISMA approach reveals insights into policy effectiveness and challenges. The findings highlight the increasing recognition of sustainable food production and land management in Indonesia, with research largely centered on Java Island but with promising contributions from other regions. The research identifies a growing interest in addressing SFAL issues at different levels of government, with an emphasis on local and national strategies. Key issues discussed include policy implementation, environmental concerns, food security and legal regulations. Challenges include the complex interactions between economic, ecological, and social factors, the need for a strong legal framework, data accuracy and stakeholder collaboration. The research underscores the importance of a holistic policy approach, accurate data, and stakeholder engagement to achieve sustainable food production and land management. The research provides a valuable foundation for future policy planning, by offering a comprehensive perspective on the challenges and opportunities in developing agricultural systems that contribute to global food security while maintaining environmental sustainability and social well-being.

Keywords: Sustainable agriculture- Agricultural land policy- Food security- Land protection policy

ABS-49**Feasibility and Performance Analysis of Utilizing Spent Mushroom Substrate as Biomass Fuel**

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A novel biomass system has been developed that utilizes spent mushroom substrates (SMS) and combines a pre-drying and drying system. The novel biomass system consists of a boiler and an organic Rankine cycle (ORC), which employs Isohexane as the working fluid to enable operation at high temperatures. The high moisture content of the SMS is dried by pre-drying from condensation waste heat of ORC and drying from the flue gas of boiler to improve calorific value of SMS. In the present study, the moisture content of the SMS and evaporation temperature of the ORC are ranged from 50% to 65% and from 130^oC to 180^oC. The results show although thermal efficiency of ORC increased with an increase of evaporation temperature, the maximal output power is 412.21 kW at evaporation temperature of 150^oC. Additionally, when the moisture content of the SMS is 50 %, the thermal efficiency of the entire system approaches the maximal value (58.6%).

Keywords: biomass- SMS- rotary dryer- organic Rankine cycle

ABS-50

The Effect of Paving Block from Plastic Waste Material in The Urban Drainage: Study Case in Residential Areas

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Large expanses of green, open land are frequently converted as a result of population growth and quick development. This phenomenon causes the decreasing of water infiltration area which has an impact on increasing runoff coefficient. In the urban drainage problem, paving blocks are often used as road pavement construction materials to reduce surface runoff. The aim of this research is to study the characteristic of flow in the paving block made from plastic waste material. The paving block is made by cement with 27% plastic waste. The research conducted in the laboratory testing utilizing a rainfall simulator by several variations in slope of 0%, 5%, 10%, and 15%. The findings indicate that paving blocks made from plastic waste have less runoff coefficient than asphalt or concrete pavement. There is a correlation between the slope of the land and runoff coefficient value which the runoff coefficient value increasing as the slope of land increases. That finding is then applicated in urban drainage problem located in the Cipamokolan Village region in Bandung city with the help of SWMM program for drainage calculation. As a result, the runoff discharge is decreasing by implementing the paving block made from plastic waste.

Keywords: Paving block, Plastic waste, SWMM, runoff discharge

ABS-51

Comparison of The Effectiveness of Micromaterials and Nanomaterials of Lime as a Stabilizing Agent for Expansive Soils on The Value of The Plasticity Index

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Expansive soils are soils that have high shrinkage expansion. This condition is detrimental to buildings on it. Losses due to swelling and shrinkage in expansive soils require stabilization with quicklime with varying particle sizes of materials needed to reduce soil swelling and shrinkage. Stabilization with nano has been widely used. However, the procurement of nanomaterials is very expensive. Therefore, this paper will explain the effectiveness of micromaterials when compared to nanomaterials. The main focus that will be discussed in this paper is how the comparison of plasticity index (PI) values between micromaterials and quicklime nanomaterials on expansive soils. The research was conducted at the Bandung State Polytechnic Laboratory. This research uses a stabilization method by adding 2% lime per particle size. The procurement price of nanomaterial was Rp. 2,500,000 and micromaterial was Rp. 1,500,000. The plasticity index (PI) test results obtained are the original soil is 35.68% - mixed soil 2% micromaterial lime is 11.51% - and mixed soil 2% nanomaterial lime is 7.62%. The results of PI values < 12 both include low expansive, so the more effective result is the PI condition of adding 2% micromaterial lime with the procurement of cheaper prices.

Keywords: Expansive soil- Stabilization- Micromaterial- Nanomaterial

ABS-52

Influence of Thermal Aging on Dielectric Characteristics of Transformer Insulating Oils

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Transformer oil is a liquid insulating material used in transformers as insulation and coolant. Particular characteristics insulating oil materials must be able to withstand breakdown voltages, while transformer oil as a coolant must be able to minimize heat generated, so that transformer oil is expected to protect the transformer from disturbances with these two characteristics. In order to reduce the percentage of transformer failures, it is necessary to maintain the purity of the oil. The features of aged transformer oil and pure transformer oil are investigated in this study. Pure transformer oil is heated to a particular temperature and cycled to create samples of aged transformer oil. The electric field intensity of transformer oil is measured to estimate the dielectric strength of aged transformer oil. FEM analysis is used to determine the intensity of an electric field. At aging temperatures of 130- and 150-degree Celsius, the dielectric characteristics of transformer oil for both Shell Diala and Triapar types will be investigated. As a result, not only the electrical characteristics but also the effects of thermal aging on the physical and chemical properties of transformer oil will be reported in this study.

Keywords: aged transformer oil, dielectric characteristics, thermal aging

ABS-53

Conceptual Model of Hydrogeology Condition Around Tambakboyo Artificial Lake in Sleman Regency, Yogyakarta

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Groundwater nowadays has become one of the public necessities. Tambakboyo Artificial Lake in Sleman Regency, Special Region of Yogyakarta Province mainly functions as a recharge lake for the local groundwater. The location of this lake at the economic and educational center leads to an increase in groundwater use, affecting the quality and quantity of groundwater. The groundwater flows through hydrogeological conditions around Tambakboyo Artificial Lake, part of the Sleman-Yogyakarta Groundwater Basin. This study aims to know how groundwater system works by developing the hydrogeology conceptual model of the Tambakboyo Artificial Lake. Hydrogeological direct observation in the field consists of measuring groundwater level, geoelectrical survey, slug test, and secondary data of bore log and climate data. All those data were analyzed and interpreted to develop a 2-dimensional conceptual model of the hydrogeological condition. The analysis shows that the study area is urban with a recharge of approximately 331.80 mm/year. The hydrostratigraphy around Tambakboyo Artificial Lake is commonly formed by the gravelly sand, silty sand, and breccia layers, with sand and silty sand acting as one aquifer system. The clay layer was found as an aquifer base at a depth ranging between 68 and 120 meters. The thickness of the aquifer decreases from north to south with the permeability value (K) around $4 \cdot 10^{-5}$ to $2 \cdot 10^{-4}$ m/s. Based on the relationship between surface water and groundwater, Tambakboyo Artificial Lake can act as a recharge lake for its main purpose.

Keywords: Groundwater, Hydrostratigraphy, Conceptual Model

ABS-54

Flood Risk Assessment of Kemang Area as a Central Bussiness in South Jakarta

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This paper presents a flood risk assessment of Kemang area which around 80 Ha as central business at South Jakarta, DKI Jakarta, Indonesia. It is crucial to assess this area as it well-known as central business that has high damaged due to affected by flooding. The objective of this study to know the current level flood risk in the area and then how structural interventions through improving drainage pumps capacity with 2 m³/s contribute to its level. The rational method, HEC-RAS 2D, and GIS have applied for methods flood risk analysis in two years return period of rainfall (138 mm/day). Flood risks calculated based on hazard index, vulnerability index and capacity index in scale of 20 RT (neighbourhood associations). As the result, flood risk map show that the Kemang area has 65 % highly risk of flooding, 10 % in moderate level and the rest is low level risk of flooding. The current planning of structural intervention not significant to reduce risk level. Therefore, it needs more actions to reduce the flood risk level through both structural and non-structural measures such as normalization of drainage system, policy, and social and private engagement.

Keywords: Floods, flood risk, drainage system, HEC-RAS 2D, structural measures

ABS-55

Glycerine Pitch as a Partial Replacement of Pen 60/70 in AC-WC Mixture

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Glycerine pitch is the product of purifying glycerol from the oleochemical industry. The high processing cost of glycerine pitch, which amounts to US- 400/ton encourages more efficient utilization of glycerol. This research glycerine pitch used was grouped based on the inorganic content derived from 13 Indonesian. oleochemical companies. With a grouping of inorganic content <10% is sample 1 and inorganic content >10% is sample 2. Furthermore, the rheological test of pen 60/70 asphalt and the characteristics of AC-WC asphalt mixture using Bina Marga 2018 Rev 2 specifications. This research aims to utilize glycerine pitch as an asphalt substitute. For Marshall testing variations in asphalt content are 4%, 4.5%, 5%, 5.5%, 6%, 6.5%. From the test results, the optimum asphalt content for glycerin pitch with sample 1 is 6% with Density 2.26 g/cm³, VIM 4.4%, VMA 18.77%, VFB 76.53%, Stability 619 kg, Flow 2.83 mm, MQ 211 kg/mm and sample 2 optimum asphalt content 6.1% with Density 2.34 g/cm³, VIM 5%, VMA 15.68%, VFB 68.02%, Stability 1092.3 kg with Flow 3.45 mm and MQ 316 mm. With a greater stabilization value sample 2 is better as a paved mixture.

Keywords: Oleochemical, Glycerine Pitch, Asphalt Rheology, AC-WC, Marshall Method.

ABS-56**Critical Examination of Multi- Lane Free Flow Tolling System Implementation in Indonesia**

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Indonesia's multi-lane free flow (MLFF) tolling system will meet new challenges after it is operationalized. Many think that this tolling method will be beneficial not only for the toll road user but also for toll road operators (TROs) and transportation authorities. On the contrary, the drawbacks are also being considered in several reports and discussions. Moreover, too little research to shed light makes the complexity of the MLFF tolling system remain largely uncharted. This paper critically examines the Indonesian MLFF tolling system, questioning prevailing assumptions and encouraging further study. Employed systematic review of all related documents that mentioned electronic toll collection, specifically on MLFF and open road tolling (ORT) system, this study offers valuable insights into the practical effects in real-world situations. The toll road authority should re-evaluate some regulations concerning minimum service standards imposed on the TROs. The privacy issues as an excess of using Global Navigation Satellite System (GNSS) that tracks each toll road user appears to become mainstream, while others deserve attention. The traffic information provision as a tool of traffic management should be considered as one of the solutions to provide valid traffic information derived from a scientifically sound method based on verifiable probe data.

Keywords: Multi Lane Free Flow- Open Road Tolling- Electronic Toll Collection

ABS-58**Application of DRASTIC Method to Identify the Groundwater Vulnerability to Pollution in the Sub-District of West Limboto and Limboto, Gorontalo Regency, Indonesia**

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The increment in population and agricultural sectors in West Limboto and Limboto, Gorontalo, affects the increased production of pollutants. The community uses shallow groundwater as the main water source. Since shallow groundwater is vulnerable to pollution due to community activity, this study aims to identify its vulnerability in West Limboto and Limboto. It was identified using the DRASTIC Method that will be integrated with Geographic Information System (GIS) Technique. The used parameters are Depth to Water Table, Recharge, Aquifer Media, Soil Media, Topography, Impact of Vadoze Zone, and Hydraulic Conductivity of the Aquifer. Depth to Water Table data is obtained from direct field measurement. Recharge amount data is obtained from the calculation of groundwater recharge. Aquifer Media, the Impact of Vadoze Zone, and Soil Media data are obtained from surface and subsurface geological data. Topography data is obtained from Digital Elevation Model Map. Hydraulic Conductivity is obtained from Slug Test Data. The analysis result shows that the groundwater vulnerability of the study area was classified into 2 classes, the high index was in the southern part, and the low index was in the middle to the northern part of the study area.

Keywords: DRASTIC Method- Groundwater- Vulnerability

ABS-59**Investigation of Hydrogeology Condition in Manikin Dam Diversion Tunnel, Timor Island, Indonesia: a Case Study**

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The seepage phenomenon happened in the construction site of the Manikin Dam Diversion Tunnel, Timor Island, Indonesia, has hampered the progress of construction. It seems impossible since the tunnel construction site was at the Bobonaro Complex. This condition leads to investigate the possibility of the other seepage occurrence along the tunnel construction site since more than 500 m long tunnel remains to be excavated. This study was conducted by direct observation method of the geological and hydrogeological conditions. Interpretation to direct field of geological mapping result, 10 borehole cutting samples, 14 lines of geo-electrical survey data and face-mapping of tunnel excavation data resulting the surface and subsurface geological conditions. Hydrogeological mapping was performed to portray groundwater condition at the tunnel site. The research reveals the study area consist of scaly clay (fragmented with exotic block) unit and carbonate sandstone unit. Basically, the scaly clay is impermeable while the carbonate sandstone is permeable, but the fractured exotic blocks were also to act as an aquifer. The groundwater flows to tunnel comes from this fractured zone in the exotic blocks. Based on this condition, other seepage phenomenon possible to be happened, as shown on the interpretation of the geo-electrical survey.

Keywords: Manikin Dam- Hydrogeology- Geo-Electrical Survey

ABS-60

Parametric Study of Soil Nailing on Slope Stability using a Numerical Approach: Case Study of Slides in Cimanggung District, Sumedang Regency

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On January 9, 2021, a landslide occurred in Bojong Kondang Hamlet, Cihanjuang Village, Cimanggung District, Sumedang Regency. This landslide incident caused many casualties and damaged residents' houses. This study focuses on analyzing the stability of slopes reinforced with soil nailing. The influence of slope geometry and spike parameters on slope stability was investigated using Geoslope. Four different slope angles and three different back slope angles were considered to assess the effect of slope geometry on nailed slope stability. The safety factor (FS) was found to decrease with increasing values of the slope angle as well as the back slope angle. The influence of different nail parameters (nail inclination, nail length, and nail spacing) was also investigated. With increasing nail inclination, FS was found to increase initially and thereafter, reaching a peak value followed by a decrease in FS. The optimal nail inclination was found to be between 0 and 25 at a horizontal angle, depending on the different slope geometries, which is also evident from the sliding surface observations. As nail length increases, FS increases. However, the increase was small after L/H (length of spike/height of slope) reached a value of 0.9. In addition, increasing the length of the spikes has proven effective in reducing sideways slope movement. Maximum soil nailing strength is observed at the bottom nail row and increases with depth. The inclusion of soil nailing with optimal nailing parameters can increase the FS by 29-75% depending on the slope geometry, indicating the effectiveness of soil nailing.

Keywords: soil nailing, slope stability, safety factor, Bojong Kondang

ABS-61

The Effect of Adding Biopolymers on the Physical Properties of Peat Soils

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Indonesia's peatlands are concentrated in three major islands, namely Sumatra (35%), Kalimantan (32%), Papua (30%), and other islands (3%) of a total area of 21 million ha. The carrying capacity of the soil is largely determined by the value of the water content contained in the peat. To overcome this problem, stabilization is carried out using a mixture of biopolymers to increase the carrying capacity of the soil. In this study, testing of the physical properties of peat soil was carried out in order to determine changes in the value of the physical properties of the soil that occurred after stabilization. The sampling location is in the area of Palangka Raya City. There were 5 variations of samples made for stabilizing peat soil with a mixture of 0.5%, 1%, 2%, 2.5%, and 3% biopolymer. The final results obtained after testing the physical properties of post-stabilization peat soil were a decrease in water content in the 3% biopolymer (395.13%) variation, the maximum decrease in fiber content in the 3% biopolymer (30.79%), and the maximum ash content obtained in the 3% biopolymer increasing the value of the bulk density at 3% biopolymer (1.64%) and increasing organic content (96.62%) at 3% biopolymer variation.

Keywords: Peat, Stabilization, Biopolymer, Peat Soil Physical Properties Test

ABS-62

Risk Analysis of Debris and Non-Debris Flow in the Cisokan River Flood Event

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Cisokan River is one of the main inflow rivers of Cirata Reservoir, aside from Citarum River, Cisokan River is the second largest contributor to Cirata inflow with an average annual flow of 26.15 m³/s. In May 2023, Cisokan River experienced instances of flash flood disasters that submerged houses in Cianjur Regency. Indicated that the cause of this flood is because narrowing of the river cross-section, causing the flow during heavy rainfall to be unable to be accommodated and overflow into the land. The high sedimentation could also cause debris flow and cause the flash flood. This study will conduct the risk analysis resulting from debris and non-debris flow with the changes in river cross-section due to sedimentation that occurs. In this study, modeling was carried out employing a Digital Elevation Model (DEM) map and utilizing the Hec-RAS software. One focus of the modeling was on simulating the newtonian and non-newtonian, comparing the results and analyzing the risk from both.

Keywords: newtonian flow, non-newtonian flow, debris flow, flood, cisokan river

ABS-63

The Determinants Factors of Firm Value

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This study aims to analyze the determinants factors of firm value. company performance is important to the company's operational performance which is reflected in firm value. The data were collected from 41 manufacturing sector companies in Indonesia. The manufacturing sector has diverse sectors, a very broad scope, and a larger industrial scale The structural equation model-partial least square (SEM-PLS) analysis was conducted to analyze the relationship between variables and test a series of hypotheses. This study reveals the significant impact solvability and profitability have on asset turnover toward the firm value. This study proves that every stakeholder must maintain its existence by maximizing asset turnover to firm value. Conceptually, this study offers asset turnover as a mediating variable of firm value.

Keywords: Profitability- Asset- Firm value

ABS-64

A CASE Environment for Project-based Course to Learn a Sustainable Software Development

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In the context of contemporary software development education, project-based courses have gained prominence as effective pedagogical tools. This methodology empowers students to cultivate practical skills by engaging in real-world projects. However, integrating sustainable software development practices into such courses often remains a challenge such as the need to set up new technologies for each semester, making it hard to ensure consistent and disciplined development. To address this gap, this research introduces Agilearn, the conception of a Computer-Aided Software Engineering (CASE) environment tailored explicitly for project-based courses with a strong focus on promoting sustainability. It is expected to enhance the learning experience by offering a collaborative platform that automates tasks and establishes a standardized agile environment for students. This paper presents the requirements analysis, the course design to implement Agilearn, and the architecture of Agilearn.

Keywords: Agile- CASE- Project-Based Course- Sustainability- Software Development

ABS-65

Carbonization of Rice Husk for Adsorption of Phosphate Compounds: Influence of Temperature and NaOH Activator

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Rice husk is mostly composed of cellulose, hemicellulose, and lignin that can be converted into carbon to be used as an adsorbent. Phosphate is one of the elements that cause eutrophication, where excess nutrition causes the uncontrolled growth of aquatic plants (algae blooming). The purpose of this research is to determine the carbonization temperature, the concentration of NaOH activator, the characteristics of rice husk activated carbon, the rice husk adsorbent dose, and the adsorption efficiency of phosphate compounds. The phosphate compounds studied are artificial phosphate compounds in the form of Sodium Tripolyphosphate (STPP) and phosphate compounds in laundry wastewater. Rice husk carbonization was done for 1 hour with temperatures varied at 400, 425, and 450 C. The carbon activation of rice husk was done for 24 hours with a variation of NaOH concentration of 0.3, 0.5, and 0.7 M. Characteristics of the activated carbon of rice husk analyzed are water content, ash content, volatile matter content, fixed carbon content, and absorbency to methylene blue. The performance test of activated carbon with a size of 100 mesh was performed at a speed of 100 rpm and a stirring time of 45 minutes. Activated carbon with the best characteristics is obtained from a carbonization temperature of 450 C and activated by 0.3 M NaOH. The characteristics obtained are water content of 1.90%, ash content of 35.82%, volatile matter of 20.04%, fixed carbon 42.25%, and absorbance of methylene blue at 49.4 mg/g. The best dose is 16 g/L of active carbon with an adsorption efficiency of 75.15% on STPP and 93.7% on laundry wastewater.

Keywords: rice husk, activated carbon, adsorbent, phosphate, laundry wastewater

ABS-66

The Effect of Waste Marble Powder and Phosphoric Acid on the Shear Angle and Cohesion Value of Expansive Soils

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The expansive clay soil is a problematic soil due to the impact of climate change, during the rainy season the soil expand significantly and while during the dry season the soil shrinks and creating cracks. Of these problems, it is necessary to carry out soil stabilization in order to determine the mechanical properties of the soil using the marble waste (LSM) and phosphoric acid (PA) chemicals. To improve soil characteristics, tests were carried out with a mixture of 2.5%, 4%, 5.5% and 7% LSM content, while content of phosphoric acid 4% for the expansive soil. Curing periods of 3 days, 7 days, and 14 days were also conducted in this study. According to the test results, the increase in the shear angle value, from originally 6.45 degree changed to 29.81 degree which increased by 21.64% of the percentage of the original soil, while the soil cohesion value, from originally 0.37 kg/cm² changed to 2.25 kg/cm² increase of 16.44% in the curing period of 14 days. This increase is caused by chemical reactions that occur as a result of chemical elements, especially calcium (Ca) and potassium (K) contained in marble powder waste, and the mineral phosphorus (P) contained in phosphoric acid chemicals.

Keywords: Expansive_soil, Waste_marble_powder, Phosphoric_acid, Shear_angle, Cohesion.

ABS-67

State Transition Matrix and Markov-Chain Diagram for Frequent Volcanic Eruptions: Krakatoa, Indonesia

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Krakatoa has been a global attraction throughout history. Historical records of eruptions on this volcanic island complex provide thrill and excitement for visitors at once. They are often stunned by sudden eruptions, noticed by columns of ash billowing high into the sky and drawing attention to the scene. However, eruptions such as this also risk visitors of an improper radius. Therefore, in this study, we aimed to reveal the probability pattern of eruptions to sustain preparedness for the worst. Through the Anakrakatau eruption dataset that we collected from 2018 to 2023 [n=540], we propose a transition matrix diagram of eruption events generated from probability analysis. The approach of this method is based on a Markov-Chain analysis. This study assessed the period between eruptions and the probabilities of observed column height. In this study, state determination refers to the K-Means Clustering (k=3) each variable. The results show that there are states that represent the variety of circumstances transitions in frequent small activity eruption. The highest probability achieved up to 0.888 at eruption with maximum ash column below 800 m and time gaps between eruptions in less than every two days (0.83). The results of this study provide new insights into the probability of annual eruptions and provide information for sustainable risk mitigation purposes. This report can be a reference for visitors to the Krakatau area, either for education or research.

Keywords: Krakatoa, Volcanic islands, Clustering, Markov-chain, Sustainable Development

ABS-69

Fish Fry Counter Based on Digital Image Processing Method

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Large quantities of ornamental fish seeds can be time-consuming and error-prone to count manually. The tedious counting of ornamental fish seeds can also be stressful and result in the death of the fish seeds, which can result in lost sales for ornamental fish businesses. In order to solve these issues for the ornamental fish businesses, the goal of this research is to develop a system for automatically counting the number of fish seeds using the thresholding and morphology methods based on digital image processing. The fish seed counter has been tested with four distinct types of fish seeds, is capable of counting up to 130 fish seeds in 1-3 seconds for a single operation. The final result generated by this tool are an image with a description of the total number of fish seeds encountered, the date and time of data collection, and the number of fish seeds detected. This information are stored in a database with .xlsx extension. The experiment's result appears that this tool can count the number of fish seeds corresponding to different colored fish species. However, when calculating the total amount of fish seeds that can fit into the container to its full capacity, the tool has an accuracy of 95.86% and an average error of 4.14% that is caused by the side of the container which contains fish seeds that are not visible to the detection camera (blind spot).

Keywords: Fish Seeds, Thresholding, Morphology, Digital Image Processing

ABS-71

Design and Implementation Digital System Module for Vocational Education Studies

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Digital system knowledge is the basis of learning in the field of electronics. The learning begins with knowing the types of logic gates to the application of digital systems in the use of memory. The learning process uses small component parts that will be assembled by students. This makes a lot of practicum time wasted because it takes time to check components and move from assembly from job 1 to the next job. This research develops an integrated practicum module in one board that facilitates assembly time and module reliability that is not easily damaged if used by many students. The digital system module has been tested on 10 students using all parts such as flip-flops, registers, counters, and memory. All parts of the module can work well, and the module components function 100% and the module successfully functions as a means of student learning.

Keywords: Digital System, Flip-Flop, Register, Counter, Memory

ABS-72**Productivity Analysis and Technical Efficiency of Sweet Corn**

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This study aims to analyse the factors influencing the productivity of Secada F1 sweet corn varieties. Employing a survey method, 34 sample farmers were involved. Analysis utilized the Stochastic Frontier Model approach. The findings show the effect of Lannet pesticide and labor use on Secada F1 corn yield. The judicious application of Lannet pesticides correlated positively with elevated production levels. Similarly, labor input exhibited a proportional relationship with crop yield. Assessment of technical efficiency revealed a spectrum from 0.69 to 0.99, with an average of 0.96. This indicated most farmers operated within a realm of technical efficiency, adeptly harnessing resources, and techniques to optimize yields. This study's contribution lies in unravelling the multifaceted tapestry of factors shaping Secada F1 sweet corn productivity. Meticulous methodology, advanced analytics, and insightful findings underscore the significance of pesticide usage, labor optimization, and technical proficiency. As the agricultural community navigates contemporary complexities, these revelations offer valuable insights to inform practices and steer them towards sustainable growth.

Keywords: technical efficiency, sweetcorn, stochastic frontier analysis

ABS-75

Power Factor Correction of Three-Phase Electrical Power Supply by Using of Thyristor Controlled Reactor VAR Compensator

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Low power factor (abbreviated as pf), particularly lagging pf, brings a lot of negative effects to electrical power supply system. Lagging pf is caused by inductive load. Inductive load with low pf draws higher current for the same active power demand. Higher current results in larger kVA rating and size of all electrical equipment connected to the electrical power system, larger conductor size used to deliver electrical power to the load, higher loss hence poorer power distribution efficiency and higher voltage drop hence poorer electrical power system voltage regulation. Considering all these negative effects, reactive power (VAR) compensation is needed. This paper analyses characteristics of a VAR compensation method called Thyristor Controlled Reactor (TCR) applied in three-phase electrical power system supplying an inductive load. A TCR consists of three sets of a capacitor connected in parallel with an inductor. The capacitor will supply a certain amount of reactive power needed by the load. The inductor is connected in series with an electronic static switch named as TRIAC to control the amount of reactive power absorbed by it. When reactive power supplied by the capacitor is higher than reactive power demanded by the load, the switching angle of TRIAC is controlled in such a way that excess of reactive power supply is absorbed by the inductor. In this work, three capacitors in which capacitance of each of it is equal to 50 micro-F as well as three inductors in which inductance of each of it is equal to 200 milli-H are used to compensate an inductive load which has power and pf vary from 1.5 kW to 4.6 kW and 0.46 to 0.84 respectively. By controlling the switching angel of TRIAC, pf of the three-phase electrical power system is successfully maintained close to unity at 0.95 following changes of the load. However, further analysis shows that operation of the TRIAC results in increase of current harmonics. Average of total current harmonic distortion (THD) increases from 15.13% to 18.45% due to use of TCR.

Keywords: compensation, harmonics, power factor, reactive power, TCR

ABS-76

Effect of Voltage Supply Unbalance on Temperature Distribution of Three-Phase Induction Motor

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Three-phase induction motor is the most popular kind of electric motor used in industrial applications. To operate in ideal condition, a three-phase induction motor should be supplied by a balance three-phase voltage source. A balance three-phase voltage source has three sinusoidal per-phase voltages that are equal in magnitude as well as in frequency and differ in phase by 120 degrees. However, it is often found that a three-phase induction motor operate in non-ideal condition, for example operate under unbalance three-phase voltage source. A three-phase induction motor operate under unbalance three-phase voltage source gives different performances to that operate under balance three-phase voltage source. In this paper, effect of three-phase voltage supply unbalance on temperature distribution of a three-phase induction motor is carefully analysed. Three different laboratory experiment have been set-up. The first one is a three-phase induction motor supplied by balance three-phase voltage source. The second one is a three-phase induction motor supplied by three-phase voltage source with magnitude unbalance. The magnitude unbalance is set at three different values i.e., 3%, 4% and 5%. The last laboratory experiment set-up is a three-phase induction motor supplied by three-phase voltage source with magnitude and phase unbalances. Considering high temperature that may occurs, experiment under magnitude and phase unbalances is run only for 3% and 2 degrees of magnitude and phase unbalances respectively. For each experiment set-up, the motor load is varied at 0%, 50% and 70% of its nominal load. Experiment data tell that the higher unbalance of three-phase voltage supply, the higher temperature of three-phase induction motor. Highest temperature occurs at 5% of magnitude unbalance and 70% loading condition. Temperature at motor bearing is higher than temperature at motor body. The highest temperatures of bearing and motor body are 64.4 Celsius degree and 53.2 Celsius degree respectively. Actually, the most non-ideal condition is when the motor supplied by three-phase voltage source with magnitude and phase unbalances. It is found that if percentage of magnitude unbalance is increased to 4% while keeps phase unbalance remain at 2 degrees, the motor will quickly burn out due to very high motor current that exceeds its nominal value. Higher motor temperature reflects higher losses, thus results in lower motor performance.

Keywords: induction motor, temperature, unbalance, voltage supply

ABS-77

Fabrication of the Mini Multi-Function Pepper Machine

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Pepper is one of the most significant agricultural products in Sarawak, Malaysia currently in the fifth largest pepper producer in the world after Vietnam, India, Brazil, and Indonesia. Black pepper and white pepper both come from the same plant, but they are prepared differently. Black pepper is made by cooking dried unripe fruit, meanwhile white pepper is made by cooking and drying the ripe seeds. The production contributes to the aspects of economy and plantation rate of the state. However, the process of pepper through manual work is time consuming and a tough process which requires commitment and hard labor from the farmers. Therefore, the objective of this research is to fabricate the Multi-Function Pepper Machine for small or medium enterprise by reducing the time of drying process. This fabrication machine consists of all the procedures involved in the production of white pepper, which are soaking, heating, drying, and grinding process. Through the operation observed, this machine was able to undergo production in 208 to 300 minutes for 300g of white pepper, in comparison to the traditional way that needs approximately 1 to 4 weeks to undergo one production batch of white pepper.

Keywords: Pepper, Black Pepper, Manufacturing, Fabrication, Soaking, Heating, Drying, Grinding

ABS-78**The Effect of Tanduk Banana Peel Waste Concentration in Fermentation Process to Produce Ethanol by SSF And SHF Methods**

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In 2021, Indonesia's banana production is expected to reach 8.74 million tons. The high number of bananas produced in Indonesia will result in a significant amount of banana peel waste, accounting for around one-third of the banana fruit. Banana peel waste still contains 18.5% carbohydrates, which can be turned into glucose and utilized as a raw material in the production of ethanol. In this study, ethanol was produced from banana peel waste using versions of the Separated Hydrolysis Fermentation (SHF) and Simultaneous Sacharification and Fermentation (SSF) techniques, as well as raw material percentages of 20%, 25%, and 30% (w/v). The SSF method employs the cellulase enzyme, whereas the SHF method employs HCl for the hydrolysis step. The fermentation process is facilitated by the microbe *Saccharomyces cerevisiae*, with a fermentation time of 96 hours and sampling every 12 hours. The results demonstrated that the greater the concentration of banana peel, the bigger the amount of glucose produced during the hydrolysis process, and thus the amount of ethanol produced. The concentration of 300 g/L banana peel waste is optimal for producing ethanol in the SHF and SSF procedures. However, the SHF approach produced 54% more ethanol than the SSF method (33.7%).

Keywords: Ethanol- fermentation- banana peel- SHF method- SSF method

ABS-79

EDFA with Power Pump Laser in WDM Network Design of 10GBPS Transmission

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Wavelength Division Multiplexing (WDM) that enabled optical networks are currently widely used in current telecommunications infrastructures and are anticipated to play a significant role in next-generation networks and the future Internet, supporting a wide range of services with a wide range of bandwidth, latency, reliability, and other feature requirements. In WDM networks, the input power of an optical transmitter is crucial- as a result, this results in a good output signal at the receiver side. The purpose of this paper is to design a WDM Optical Network in terms of length and pump power. The system is simulated using Optisystem software to achieve bit error rate (BER), quality factor, and output power of EDFA through optimized fiber length and pump power. All results are analyzed using Optisystem simulation software at 10 Gigabits per second (10GBPS) transmission system.

Keywords: Wavelength Division Multiplexing (WDM), Erbium-Doped Fibre Amplifier (EDFA), Pump Power, Optisystem, Bit error rate (BER).

ABS-80**SME'S Household Work Time in Sawahlunto City West Sumatera Indonesia**

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This study analyses the outpouring of household work time for cassava cracker business actors in Sawahlunto City, West Sumatera Indonesia. The method used in this research is descriptive qualitative and descriptive quantitative with a survey approach. The sampling method is simple random sampling of 25 households. The data collection method used was interviews using an interview guide. The results of the study show that female workers devote more time to MSME businesses. The amount of working time for women is 10.88 HOK/month. Meanwhile, male workers devote their working time to 6.25 HOK/month. They carry out production activities every 3-7 times a week. The price of cassava crackers ranges from IDR 15,000-35,000/kg. In cassava farming and other productive activities, male workers devote more of their working time than female workers. Male workers devote their working time to cassava farming of 3.14 HOK/month and to other productive activities of 4.58 HOK/month.

Keywords: Household, Cassava crackers, Cassava, Working time

ABS-81

Power Factor Improvement Utilizing Resources of Renewable Energy

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An AC synchronous motor can be operated by a fuzzy logic (FL) controller to produce reactive power and move the entire system to its ideal operating position. The FL controller performs effectively under loads that change quickly and moderately. The plant power factor (PF) was monitored and increased to the optimum level with outstanding performance from the FL controller. The FL controller and synchronous motor together constitute a novel practical way to utilize renewable energy sources by dynamically monitoring plant electrical parameters and automatically bringing the system to the optimal operating point. This approach might be used in the future in a setting where an industrial facility needs to be highly accurate when improving PF.

Keywords: Renewable energy, power factor, Fuzzy Logic controller

ABS-82

Development and Design of Soybean Skin Separator Device Container in Rumah Tempe Indonesia, Bogor Using Reverse Engineering and Redesign Methodology

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Rumah Tempe Indonesia in Bogor, Indonesia is a soybean tempeh production facility which uses the Appropriate Technology movement in order to produce soybean tempeh that are hygienic, easy to produce and profitable. One of the processes in making tempeh is the process of boiled soybean peel separation, which uses a stirring device that consists of a container, blade and an electric motor. This process took the time up to 31,501 minutes in order to separate the peel of 60 kilograms of boiled soybean. To reduce this cycle time, redesigning is needed to be done to the container of the device using the reverse engineering and redesign methodology.

Keywords: Product Development, Productivity, Reverse Engineering and Redesign, Tempeh.

ABS-83

Location Prediction Using Forward Geocoding for Urban Fire Incident

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Urban fires, although not a natural disaster, are a severe threat that often occurs in urban areas. Banjarmasin City, the capital of South Kalimantan Province and one of the most populous cities in Kalimantan, recorded 159 fire cases between 2020 and 2022, averaging nearly 53 cases yearly. In today's digital era, people often share ongoing fire incidents using smartphones and update information on social media and online news. However, the resulting data could be more structured to serve as a dataset. This research addresses these issues by applying geocoding, a digital service that translates street addresses into geographic coordinates. This research uses three geocoders: Google Maps API, Bing Maps API, and Smart Monkey Geocoder. The accuracy of the three geocoders was tested using the Root Mean Square Error (RMSE) statistical method by comparing the geocoding results with valid locations. Prediction analysis was used to identify the next fire event through the density approach of the previous fire event points. This research is expected to provide insights into efficient data collection and structured data conversion, recommendations regarding the best geocoding service, and prediction of fire vulnerability locations based on recurring factors of fire incidents in the area. In conclusion, accurate data is the key to effective fire prediction.

Keywords: Location Prediction- Geocoding- Urban Fire.

ABS-84

Extraction of Chrysanthemum Oil to Produce Organic Insect Repellent

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Commercial repellent treatments incorporating plant-based components have recently gained favourable among users due to the fact they are considered safe in comparison to long-established synthetic repellents, although this is usually not accurate. Many essential oils included in insect repellents and insecticides are very volatile, which adds to their short lifespan as insect repellents. This problem, however, can be resolved by adding fixatives or appropriate formulations to increase their lifespan. The main objective of developing this organic repellent is to offer a productive, totally natural preventive solution to repel cold-blooded and harmful insects. The aim of this project is to produce an organic repellent utilizing chrysanthemum oil and chrysanthemum oil + peppermint oil, and to test the efficacy of both end products. The experimental results exhibited that all three-parameter concentration revealed significant influence on 5 ml, 7 ml and 9 ml given the average mortality time of killing was 2.62 min, 2.34 min, and 3.38 min, respectively, as Chrysanthemum oil and Chrysanthemum oil + peppermint oil that the average mortality time of killing was 2.81 min, 3.04 min, and 2.79 min to cold-blooded insects such as cockroach, flies, and ants. As a result, there is a need to analysed natural materials as biopesticides since they are harmless to humans and the environment. Knowledge on traditional repellent plants obtained through ethnobotanical studies is a valuable resource for the development of new natural products.

Keywords: repellent, chrysanthemum, cold-blooded insect, peppermint

ABS-85

Automatic Solar-Based Pet Food Dispenser System

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For the majority of people, having a pet is always simple, but caring for it will always be a pain in the neck since pet owners must devote a whole time to meeting the pet's demands, which include food, shelter, medical care, love and attention. Nowadays, feeding is one of the most frequent issues that pet owners^ encounter due to heavy work schedule. As a result, the automatic solar-powered pet food dispenser system is useful for assisting pet owners in caring for their pet's needs when they are away from home or on the road. This automatic pet feeder proposes a simple automatic pet food dispenser controlled using the Arduino as the main controller. DS3231 Real Time Clock (RTC) module that can assist in automatically giving the pets the right mealtime was employed. This helps the food dispensing process without the owner's presence, which is unlike the manual pet feeding product. The project ensures that the pets are fed on schedule and that the amount of food released is controlled appropriately. Also, this project will employ solar energy as a green energy source for sustainable development. This project can feed the pets 20 grams or less pet food in a single meal, according to the servo motor rotation setting activated by the Arduino.

Keywords: Automatic pet dispenser, Arduino, DS3231 Real Time Clock module

ABS-86

Recommendation of Excavation Method and Support System Based on Engineering Geology at Riam Kiwa Dam Diversion Tunnel, South Kalimantan, Indonesia

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Riam Kiwa Dam has a diversion tunnel to divert river flow so that construction on the main dam is not interrupted. This horseshoe-shaped diversion tunnel has a 425-meter length, a 5-meter diameter, and a 6-meter height. This research compares Rock Mass Rating (RMR) and Japan Society of Civil Engineers (JSCE) methods to determine tunnel rock mass quality and recommend excavation method and support system. Surface geology mapping, drill core analysis, and laboratory testing characterized tunnel geological engineering conditions. The results showed that slightly weathered andesitic lava lithology units dominated the research area. Based on RMR, the rock masses quality along the tunnel alignment consisted of poor and fair quality, and based on the JSCE method, the rock category along the tunnel alignment consisted of D I and C II rock categories with L massive and M massive rock types. Top-heading and bench are recommended for the tunnel excavation method based on RMR, and the double bench method and full-face method with an auxiliary bench cut are recommended for the tunnel excavation method based on JSCE. Support systems based on RMR and JSCE recommended rock bolts and shotcrete as the primary tunnel support systems, although the support system characteristics vary marginally.

Keywords: excavation method- JSCE- Riam Kiwa- RMR- support system

ABS-87**Hydrogeological and Hydrochemical Condition in Planned Tunnel B Route of the Yogyakarta-Bawen Toll Road**

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The Yogyakarta-Bawen toll road tunnel, located in Magelang Regency, Central Java Province, is a national strategic project that connects Central Java and the Special Region of Yogyakarta. It has geology resulting from volcanic processes, resulting in rocks with moderate aquifer properties and low to moderate permeability. The study covers 24 observation points, with 11 locations sampling groundwater for chemical analysis. The analysis results of hydrochemical facies are Na-K-HCO₃. Water table depth varies from 623 m to 704 m above sea level, with the water table along the tunnel route at depths of 13-40 m above mean sea level, generally above the tunnel's elevation. The groundwater flow pattern tends to move from southeast to northwest, perpendicular to the tunnel's direction. Groundwater quality testing indicates that water in the research area falls under the category of fresh groundwater, based on electrical conductivity and total dissolved solids values. The overall acidity level is generally acidic, except at specific points. In general, the interaction of groundwater with concrete results in weak erosion. It can be concluded that the groundwater at the research location is shallow, situated above the planned tunnel elevation, exhibits hydrochemical facies variations, and has the potential to weakly erode concrete.

Keywords: Hydrochemical- Hydrogeology- toll road- tunnel- Yogyakarta-Bawen

ABS-88**Effect of Particle Size Variation in Water Hyacinth as an Additional Substrate in the Anaerobic Process for Urban Leachate Treatment**

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Municipal solid waste leachate contains landfill-produced organic contaminants. Leachate with a high organic content can damage nearby waterways if not treated. The high content of pollutants in leachate is represented by the measured Chemical Oxygen Demand (COD) content. Therefore, leachate water treatment was carried out using the anaerobic method. The anaerobic approach was chosen because it can process high-organic waste and produce biogas, which may be used as renewable energy. Leachate from old landfills is heavy in nitrogen, thus, to optimize the anaerobic process, it must be mixed with high-carbon substrates. Water hyacinth, a fast-growing plant with a high carbon content, is a weed because it can upset the ecosystem. This research begins by comparing the anaerobic reactor with a single substrate of leachate and a mixed substrate (leachate and water hyacinth). Water hyacinth was added with size variations of 1 mm- 5 mm- 10 mm- and 15 mm. From the four variations, the mixed substrate reactor had a higher COD reduction efficiency than the single substrate in all water hyacinth sizes, with an optimum efficiency of 81% and a total biogas volume of 4,530 mL at a size of 1 mm.

Keywords: Anaerobic, Leachate, Chemical Oxygen Demand, Particle Size, Water hyacinth

ABS-89

Automatic Air Quality Control Monitoring System in Building Services

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Air quality, temperature, and air humidity are pivotal factors that impact human well-being. These factors hold particular significance for children, especially infants, in comparison to adults. The quality of the air is gauged through the air pollution index, where a normal range falls between 0 and 100 IPU. Air pollution indexes exceeding 100 are considered poor and are likely to impede respiratory health. Elevated temperature values surpassing room temperature can lead to increased energy consumption when utilizing fans or air conditioners to regulate indoor temperatures. Unnecessary energy wastage can occur if fans or air conditioners continue running even when the ambient temperature drops below room temperature. Excessive indoor air humidity promotes mildew growth, resulting in respiratory issues and potential harm to occupants within the household. An arrangement has been devised employing WEMOS D1 Wifi, alongside MQ135 and DHT11 sensors, with the aim of gauging and overseeing indoor air quality, temperature, and humidity through online connectivity. The obtained readings for air quality, temperature, and humidity levels will be viewable on the Blynk mobile application. This mechanism is geared towards notifying the occupants if the current air quality becomes unsuitable for breathing, subsequently activating the ventilation system automatically. The primary purpose of this system is to vigilantly monitor and enhance the well-being and living conditions of residents, particularly children, and infants. This is achieved by mitigating the risks of respiratory ailments, and fungal contamination, and ensuring more efficient electricity consumption.

Keywords: Keywords: Air quality, air quality index, WEMOS D1, Blynk.

ABS-91

The Effect of Addition of Low-Density Polyethylene (LDPE) on Cracking and Durability of Asphalt AC-WC Mixture

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The increase in the number of roads in Indonesia has resulted in the volume of vehicle traffic increasing. This condition causes problems in the quality of road pavement which is influenced by vehicle traffic loads. Asphalt is a type of road pavement material that is solid or semi-solid, black to dark brown in color, has adhesive properties that will soften and melt when heated. The Asphalt Concrete - Wearing Course (AC-WC) layer is the second wear layer in asphalt concrete and the top layer in flexible pavement. The aim of this research is to determine the effect of adding Low-Density Polyethylene (LDPE) plastic waste on the crack value, durability, and penetration resistance of AC-WC 60/70 asphalt. This research was carried out using LDPE plastic waste additives with LDPE variations of 2%, 4%, 6%, 8% and 10% with a planned asphalt (Pb) content of 5% and a total test object weight of 1200 grams. This research produces briquettes that have different Marshall characteristic values. From the research results it is known that the LDPE plastic content meets the level of 4%. With the 4% LDPE plastic content, AC-WC asphalt is able to produce high resistance and durability that meets the requirements.

Keywords: Asphalt, LDPE_Plastic, Marshall_Test, Resistance, Cracking

ABS-92

Design of Battery Energy Storage System (Bess) with Fuzzy Supervisory Control for Pico Hydro Power Plant

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Energy is a very important factor for developing a country especially electricity which is taken granted by everyone nowadays. It is very tough for those who are living in rural area and without electricity as it is demanded almost 365 days per year and people will get annoying on their daily life if there is a sudden blackout even for more than 1 minutes. There was many research focused in the green technology especially renewable energy resources. It includes wind energy, solar and also hydropower, which are in abundance in the natural environment and are practically inexhaustible. Hydropower, more specified to the stand alone pico hydro, not only environmental friendly, it is also convenient to the end users in terms of easy installation on site, cheaper cost, low maintenance and site accessibility as most of the rural areas do not have the grid access. Especially for those people living in rural areas of Sabah & Sarawak. Therefore, it was a crucial part of research area in renewable energy. Recently, many researcher works are published in terms of output performance of frequency control to maintain system stability on pico hydro power plant by using electronic load controller or flow valve control. No doubt, it's part of the factor to have smooth and stable power quality in rural electrification area. However, electronic load controller by using dump load concept causing energy wasting issues. Hence an efficient energy management in system can't be neglected while trying to improve system stability. Rural areas in the country normally will not be connected to the grid due to the economic reason and distance issues, therefore it is important to have efficient system for extra load to be recycle and supply when there are high load demand again. The aim of this research is to design a battery energy storage system with fuzzy control which will be simulated using MATLAB SIMULINK for analysis and verification purpose. This research provide a better alternative in terms of recycling energy resources.

Keywords: Fuzzy-PID controller, step response, pico hydro

ABS-94

Assessment of Rainwater Harvesting Potential Based on Field Observations in Jagakarsa District Area, South Jakarta

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Jagakarsa is one of South Jakarta's districts that is a catchment area for rainwater. Due to the high rate of population expansion, changes in land use have accelerated the built environment's development. Increased runoff from the rain causes more floods as a result. Because there isn't a government-run pipe system for transporting clean water, the majority of people use drilled groundwater wells. Ongoing groundwater consumption has an impact on land subsidence and groundwater availability sensitivity. So, it is necessary to do research. Based on field observations, this study seeks to evaluate the possibilities for rainwater harvesting. It was necessary to analyze local rainfall data, conduct direct field surveys, gather field test data on soil permeability, measure groundwater levels, disseminate research programs, and analyze questionnaire responses. The result is an average annual rainfall of 2809.7 mm, soil permeability of 0.00273 cm/second, a shallow groundwater level of 2.27 m, and 98.25% of respondents who use groundwater for their clean water needs. According to the research's findings, the study site has a lot of potential for rainwater harvesting. For the integrated application of rainwater harvesting, a more thorough and extensive analysis will be conducted after this initial investigation.

Keywords: rainwater harvesting, field observation, groundwater, flooding

ABS-95

Experimental Analysis of Transformer Efficiency in Relation to Load Resistance

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Transformers play a pivotal role in the distribution of electrical energy, particularly in electronic devices. Load resistance significantly influences transformer efficiency. This study employs an experimental methodology with the objective of assessing the congruence between experimental data analysis and theoretical calculations. The experimental setup involves testing a step-up transformer characterized by the following primary coil specifications: N_p (number of turns) = 500, r_p (resistance) = 2.5Ω , L_p (self-inductance) = 9 mH, and secondary coil specifications: N_s (number of turns) = 1000, r_s (resistance) = 9.5Ω , L_s (self-inductance) = 36 mH. Load resistance (R) is varied within the range of 10 to 500 Ω . The outcomes reveal a progressive enhancement in transformer efficiency with the increasing load, up to 300 Ω , after which efficiency experiences a decline. In the case of a step-down transformer, possessing identical specifications as the step-up variant, efficiency displays an analogous pattern of augmentation with load resistance up to 80 Ω , beyond which it diminishes. Furthermore, the Root Mean Square Error (RMSE) for the step-up transformer stands at 0.0012, with an R-square (R^2) value of 0.99. Similarly, for the step-down transformer, RMSE registers at 0.0060, accompanied by an R-square (R^2) of 0.99. These findings affirm the exceptional adequacy of the employed theory in elucidating the intricate interplay between transformer efficiency and load resistance.

Keywords: Transformer, efficiency, load resistance

ABS-96

Practical Electronic Maintenance and Repair Technique to Support Sustainability Development

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Electronic Maintenance and Repair is fundamentally a combination of theoretical and practical learning to support higher education in the vocational or polytechnic specialization. This material is outlined in a course by conducting experiments with existing problems with objects that are students in practicum classes. In this practice, it is explained about the specifications, damage, ways of measuring and diagnosing damage based on the Project Based Learning (PBL) method. All Standard Operating Procedure (SOP) are explained in Job Safety Analysis (JSA) and Job Safety Operation (JSO) followed by different circuits and work steps for each electronic circuit. In actual fact, after this method is applied, students can determine and make specifications for an electronic equipment/system, understand and also complete calculations about reliability and failure in electronic systems. One more thing is to recognize damage and how to measure electronic components both passive and active. It is also explaining work principles and looking for damage to a simple digital and analog electronic circuit. In the process, this method experiments with various circuits by measuring normal conditions and damage according to the given switch. The entire measurement method is performed through the specified testing point thereby analysis can be implemented based on the comparison of measurement results under normal conditions and damage. Based on the results of data and analysis of student response results aspects of PBL can be applied to tackle and solve the problems diagnosed by damaged conditions of the circuits. It can be used as MR Electronics practicum to gain and collaborate based on theory and data analysis.

Keywords: Practical, Maintenance and Repair, PBL

ABS-97

Experiments in Development of Porus Concrete as an Environmentally Friendly Alternative of Road Pavement

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The development of times and technology that continues to run has created several new needs, especially those related to road maintenance work. The need for a strong and stable road becomes less relevant if it does not refer to fulfilling the safety of road users. Currently, a new need has arisen, namely a road that is able to have a minimal negative impact on the environment, one of which is development that does not reduce the area of water catchment or avoid as much as possible the occurrence of surface runoff. Porous concrete pavement is increasingly recognized for its ability to help manage rainwater, therefore, there will be future needs for its development, related to technical planning, quality control, acceptance criteria, to the maintenance that needs to be carried out. In this research, an experiment was carried out in the laboratory of the Road Materials Center to obtain the property values of porous concrete. Planning stages up to laboratory testing with 2 (two) samples. The results of porous concrete research show that there are fundamental differences that are quite significant in terms of planning, if porous concrete pavement will be used to improve safety aspects by eliminating the potential for waterlogging that may occur on the surface of the pavement, or porous concrete pavement will be used as part of a rainwater management system.

Keywords: pavement- Porous concrete- environmental aspects

ABS-99

Environmental Implications of Styrofoam Waste and Its Utilization as Lightweight Fill Material for Enhanced Embankment Construction Performance

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The proliferation of styrofoam or EPS waste presents a pressing environmental concern due to its non-biodegradable nature and persistence in natural ecosystems. This study investigates the adverse effects of styrofoam waste on the environment, encompassing issues such as visual pollution, habitat disruption, and potential health risks to flora and fauna. The research also delves into the feasibility of repurposing styrofoam waste as a lightweight fill material in embankment construction, aiming to improve the performance of such structures. Furthermore, this research investigates the feasibility of repurposing styrofoam waste as a lightweight fill material in embankment construction, with the primary objective of augmenting the structural performance of such constructions. The paper conducts an extensive assessment of the technical properties and engineering characteristics of a soil-styrofoam mixture. Key parameters under scrutiny encompass density, shear strength, and settlement behaviors. Various proportions of styrofoam, specifically 0.2%, 0.4%, 0.6%, and 0.8% by weight, were systematically incorporated into the soil mixture. This study reveals that the inclusion of styrofoam leads to a reduction in the maximum dry density of the soil mixture. Consequently, this reduction translates into a decreased embankment weight and diminished settlement within the subsoil layer. Hence, while styrofoam waste poses detrimental environmental consequences, its integration as a lightweight fill material exhibits considerable potential for enhancing the performance of embankment construction projects.

Keywords: Soil Improvement, Design Improvement, Soil-Styrofoam Mixture, Lightweight Fill

ABS-100

Utilizing 3D Printing for Geomembrane Fabrication in Laboratory-Scale Geotechnical Testing

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This research investigates the innovative application of 3D printing technology in the production of geomembranes for laboratory-scale geotechnical experiments. Geomembranes are essential components in various civil engineering projects, particularly in environmental containment and hydraulic barrier systems. Traditional geomembrane manufacturing processes often involve limitations related to customization, speed, and material waste. In this study, the feasibility of 3D printing as a novel method for geomembrane production, aiming to address these limitations were explored. The research focuses on the design, fabrication, and mechanical characterization of 3D-printed geomembranes using PLA material. Comparative studies between conventionally manufactured geomembranes and 3D-printed counterparts are conducted to evaluate their performance in geotechnical laboratory settings. Results indicate that 3D-printed geomembranes exhibit promising properties for geotechnical testing, including high customizability, reduced production time, and minimal material waste.

Keywords: Geosynthetic, Geomembrane, 3D-Printing

ABS-101

Accelerating Fiber Decomposition Process by Pseudomonas Taiwanensis Bacteria and Its Impact on the Physical Properties and Shear Strength of Fibrous Peat Soil in Palangkaraya

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Peat soil is formed through the accumulation of undecomposed plant organic matter, resulting in a high fiber content that leads to poor physical properties and low shear strength. Consequently, peat soil is identified as problematic and detrimental in infrastructure construction. One proposed method to improve its physical properties and enhance shear strength is biological soil stabilization through biotechnology, with bioaugmentation as an environmentally friendly alternative. The objective of this research is to accelerating the decomposition of peat fiber by *Pseudomonas taiwanensis* bacteria, thereby accelerating soil compaction and improving its physical properties and shear strength. The subject of this research is fibrous peat soil in Bereng Bengkel Village, Palangkaraya City, Central Kalimantan Province. From the experimental results, it was found that the addition of 15% *Pseudomonas taiwanensis* bacteria to fibrous peat can significantly improve the physical properties and shear strength. Thus, *Pseudomonas taiwanensis* bacteria can be used as an environmentally friendly alternative to improve the geotechnical properties of fibrous peat.

Keywords: Fibrous Peat- Peat Fiber- Decomposition- *Pseudomonas taiwanensis*

ABS-102

Effect Variation of Solution Concentration and Voltage on Nickel-Chrom Electroplating at 7075 Aluminum Alloy

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The propellers of local fishing boats in Indramayu often collide with foreign objects floating in the waters which result in bent, cracked and broken propellers. The result, it cause losses for fishermen, such as vibrations the ship body, noise, and cavitation the propeller blades. This happen because on the surface of the propeller there are many pores and cracks which are an indication damage. The purpose of this research is smooth and remove surface scratches and improvement the mechanical characteristics the propeller surface with double layer nickel-chrome and hard anodize coating on AA7075 as a substitute propeller material. The method used to achieve this goal is carried out by nickel-chrome double layer and the hard anodize coating. The testing process is determine the characteristics the coating results is hardness, surface roughness, and microstructural tests to see the thickness the coating. Retrieval of hardness test data used microvickers to determine the hardness of the layer, while the hardness of the base material used the macrovickers. Surface roughness measurement used a stylus profilometer. This microstructure test an optical microscope to determine the thickness of the layer on the surface of result the surface treatment of double layer nickel-chrome coating and hard coating anodize. The results obtained, the highest hardness value in the 225.7 HV nickel-chrom electroplating process, when compared to the initial hardness value and nickel-chrom immersion, namely the electric voltage of 6 volts, the current strength of 3 amperes experienced a 140% increase from the nickel electroplating value with a thickness The layer that occurs is 102.59 micrometer and the roughness is 0.057 micrometer.

Keywords: AA7075, Elektroplating, Nickel - Chrome

ABS-104

Estimation of Coal Production Target Based on Achievement of Monthly Stripping Ratio

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The ratio of coal tonnage to overburden volume is known as the stripping ratio (SR). The mining process really benefits from this SR. Making a mine design and determining the production target for the following month both use the process of reaching SR. Overburden volume and coal tonnage are two of the data utilized in determining SR. Utilizing the Surpac 6.3 application and the cut-and-fill method to calculate the monthly stripping ratio target, mine surveying data is used to determine the volume of overburden. The stripping ratio will then be determined by comparing the amount of overburden and coal tonnage. According to study at pit A PT XYZ in September 2022, the overburden volume was 107,044 BCM. Based on the weighting bridge, there are 10,711.37 tons of coal. The stripping ratio at that time was 9.99 BCM/Ton. The stripping ratio was successfully achieved at 106.72%. This accomplishment is used to create a target for the following month and to compute the mining process's profit and loss for that month, which is computed for the anticipated production target for the following month. The achievement of coal production can be projected based on the stripping ratio with the use of these data.

Keywords: Stripping ratio, Achievement, Production target

ABS-105

The Effect of Using Biopolymers as Encapsulation Material in Self-Healing Concrete on Tensile Strength.

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Self-healing concrete is a concrete technology in which concrete has the ability to heal itself when cracks occur. This technology was developed to increase the lifespan of concrete structures, making them more durable and environmentally friendly. There are several ways to produce this self-healing concrete, one of which is to use microorganisms to produce calcite or calcium carbonate (CaCO_3) to seal cracks in concrete. Mixing microorganisms into concrete is done by direct mixing or by providing a home to isolate the microorganisms. The method of providing a home for microorganisms is called the encapsulation method. Materials used to make encapsulation vary, but the most commonly used are biopolymers. In this study, 3 different types of biopolymers were used, namely alginate, carrageenan, and chitosan. From the three types of materials, material tests were performed using tensile tests to see the behaviour of the material. The results obtained are the tensile strength for alginate, carrageenan, and chitosan of 2.02 MPa, 3.94 MPa, and 3.32 MPa, respectively.

Keywords: Alginate, carrageenan, chitosan, Self-healing concrete, microorganism

ABS-106

Effect Variation of Aluminum Hot-Dipping Time and Temperature on Hardness, Roughness and Thickness on AISI 1045

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Hot Dipping is a coating technique, where the metal is first heated until it melts at a certain temperature, then the material is dipped to coat the surface. The aim is to increase the resistance of the physical mechanical properties of the material to corrosion. The method used is coating the material. This research was conducted on AISI 1045 steel material which will be tested for hardness, roughness, and coating thickness. The results of this study showed that the hardness value at 691 Celsius for 3 minutes resulted in the highest coating hardness of 109.82 HV. The layer roughness test was obtained with an average value of 1,710 micrometers, and the layer thickness value with an average value of 53.68 micrometers. Based on the results above, it can be concluded that the longer the dipping process, the thicker the hot dipping layer will be, the hardness and roughness values are greatly influenced by time and temperature.

Keywords: Hot Dipping, AISI 1045, Hardness, Roughness, Thickness.

ABS-107**Catalytic Conversion of Glycerol to Formic Acid Under Mild Condition Over an Iron-Based Catalytic System**

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Glycerol, produced in large amounts as the main by-product of biodiesel production from biomass, has great potential to be converted into formic acid, a potential hydrogen carrier. This research aims to evaluate the performance of an iron-based catalytic system in the oxidation process of glycerol to formic acid. The methods used include making an iron (II) oxalate catalyst, determining the reaction medium and reaction time for glycerol oxidation, optimizing the conditions of the glycerol oxidation process, and analyzing the glycerol oxidation products. Optimization of process conditions includes the influence of temperature, substrate/catalyst molar ratio, and oxidant/substrate molar ratio. The research showed that water was a better reaction medium for glycerol oxidation, with a reaction time of 240 minutes. Oxidation of glycerol with an iron (II) oxalate catalyst can produce formic acid products with the best results obtained at pH 5, temperature 50°C, substrate/catalyst molar ratio of 100, and oxidant/substrate molar ratio of four with 83.18% converted glycerol. The yield and selectivity of formic acid were 47.77% and 57.43% respectively. These results indicate that the iron-based catalytic system has the potential to be an effective catalytic system for glycerol oxidation under mild conditions.

Keywords: glycerol oxidation- formic acid- hydrogen storage- fenton reaction

ABS-108

The Effect of Drying Air Flow Rate in the Drying Process of Daun Telang (*Clitoria ternatea*) Using Tray Dyere

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Anthocyanin color pigments are easily degraded in the high-temperature drying process, so the drying process must be carried out selectively. The drying process in this study was carried out using a tray dryer at a drying air temperature of 60oC which had a relative humidity of 17.8% by varying the flow rate, namely 1.6- 2.4- and 3.2 m/s. Analysis of the decrease in water content and drying rate constant was carried out to determine the effect of variations in flow rates on these two parameters based on experimental data and corroborated by correlation analysis and statistical significance. Variations in the flow rate of the drying air have an impact on reducing the water content of the butterfly pea flower by 57-60% where based on the significance test the results show that statistically, the relationship between the two variables is not significant. In addition to decreasing the water content, the constant drying rate was also studied in this study where the largest drying rate constant was 0.0154 kgH₂O/m².minute when a drying air flow rate of 3.2 m/s was used.

Keywords: *Clitoria ternatea*, drying, tray dyer

ABS-109

Effect of the Addition of Nanoscale Cellulose Fibres from Bagasse on the Characteristics of Biofoam from Avocado Seed Starch

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Starch-based bio-foam material, as an alternative to styrofoam, has shortcomings in mechanical properties and water resistance, so it needs a filler in the form of cellulose fiber, which is insoluble in water and has strong properties. It has been studied that nanoscale fibers have an excellent mechanical property. This study aims to determine the effect of adding cellulose fiber and cellulose nanofiber (CNF) from bagasse on the characteristics of biofoam made of avocado seed starch. The manufacture of biofoam is conducted over the thermopressing method. The added cellulose fibers varied from 0%, 1%, 3%, and 5% w/w, and cellulose nanofibers ranged from 3%, 5%, 10%, 15%, and 20% w/w by weight of starch. The results of testing biofoam from two different types of fillers showed that adding 5% of both fillers produced biofoam with the most excellent properties. Biofoam with 5% cellulose fibers from bagasse has a tensile strength value of 382.32 KPa, a water absorption capacity of 11.08%, and can degrade 10.94% in a specified time of 8 days. Adding 5% CNS from bagasse produced biofoam with a tensile strength of 385.02 Kpa, water absorption of 5.96%, and biodegradability value of 17.74% within eight days. It can be summarised that nanoscale fibers can increase the water resistance, mechanical properties, and biodegradability value of biofoam made with avocado seed starch.

Keywords: biofoam- biodegradable- starch- avocado seed- bagasse fiber

ABS-110

Determination of Critical Slope and Optimal Safety Factor for Zonal Embankment Dams

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The construction of dams can provide significant benefits to humanity, but it also carries substantial risks if failures occur. Therefore, meticulous attention is required from the planning and construction phases to operation and maintenance. This research examines the critical slope and optimal safety factor in the planning of zonal embankment dams, considering five alternative body dimensions while taking into account seepage and landslide stability as well as seismic loads for each condition in accordance with SNI 8064:2016 standards. Stability analyses of landslides and seepage were conducted using the Geo-Studio software to identify the depression line flow, velocity, and seepage discharge through the dam body. Analyses were performed under Normal Water Level (NWL), Flood Water Level (FWL), Rapid Drawdown, and Low Water Level (LWL) conditions. The analysis resulted in safety factor values for each alternative dam body dimension and each water level condition. The study findings reveal that alternative design 4 has the most critical slope with an optimum safety factor (SF) of 1.203 under OBE seismic loading at 0.25, with a difference of 0.003 from the established minimum safety factor limit. Alternative design 4 also exhibits the highest critical velocity for rip-rap material, amounting to $3.4 \times 10^{-5} \text{ m}^3/\text{s}$ during the FWL modelling. The critical diameter limit for transported material is found during the FWL modelling, with a value of $9.89 \times 10^{-13} \text{ cm}$. The seepage discharge meets requirements with a value of $1.08 \times 10^{-5} \text{ m}^3/\text{s}$, which is smaller than the allowed discharge. These findings have significant implications for the planning and construction of zonal embankment dams, emphasizing the importance of considering stability and safety aspects in every design alternative. This research can assist professionals in this field in making more informed and secure decisions during the dam construction process.

Keywords: Critical Slope- Optimum Safety Factor- Geo-Studio- Zonal Embankment Dams

ABS-111

Sustainable Development in Halal Tourism Industry: The Role of Innovation and Environment Concern

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Prior to COVID-19 pandemic, halal tourism was growing and becoming an important tourism sector. Although this industry suffered heavily during the pandemic, since the pandemic ended this industry is on a promising recovery. In this recovering tourism industry, understanding how to make this industry sustain is important. This study tries to model sustainable strategy for halal tourism industry from tourist perspective, i.e., tourists experience as well as their satisfaction with the visit, by using innovation and environment concern as the determinants. This study uses data from 442 inbound tourists from various Indonesian tourism destinations. Using Partial Least Square modelling, this study reveals that both innovation and environment concern are critical in influencing tourist experience in the tourism destination, with innovation having a stronger influencing power. Next, tourist experience with the attraction as well as halal products and service significantly impact on tourist satisfaction. Thus, this finding suggests innovation in the destination and tourist environment concern are crucial factors for the sustainable development in halal tourism.

Keywords: Sustainable development, Halal tourism, Technology, Environment

ABS-112

The Test Bench for Simulation Impact of Core Saturation on the Current Transformer on Coordination of Inverse Relay Protection

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When the measurement-type Current Transformer (CT) is used for protection schemes, this condition causes problems related to the operation of the protection relay. This performance can provide the right output to be captured by the relay when using the CT type of protection system, and measurement CT will be appropriately used as a measurement instrument. When the primary current is greater, the denser the flux flowing in the iron core, and when a certain primary current value is reached, the iron core is unable to accommodate the flux that must be flowed. As a result, the value E_s is unable to rise again, so the error ratio begins to rise, and the secondary current output is distorted. This research aims to design a tool that can display the distortion that occurs in the secondary current, and this research will evaluate its impact on the characteristics of the inverse-type overcurrent relay. The research method is R&D (Research & Development) by configuring a prototype analog test table so that saturation occurs on the CT connected to the protection relay. The results of the research Simulation of protection coordination failure due to core saturation can be shown, and the design of core saturation test equipment can be demonstrated. The root cause of core failure can be traced from the disconnection time deviation that occurs at the protection relay. The design of core saturation test equipment can be implemented to display protection failures due to core saturation and show the correlation between the voltage excitation curve and relay disconnection time. Testing CT ratio 30/5 with a burden of 1.5 VA, the operating limit is 200% of the primary rated rating, meaning that for CT with a primary rated current of 30 amperes, testing up to 60 amperes shows the results have not occurred core saturation.

Keywords: current transformers, fault current, saturation, protection coordination

ABS-114

Geophysical Investigation of the 2022 Cianjur Earthquake: Uncovering a New Active Fault

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An earthquake disaster struck the Cianjur area on November 21 2022, with a main earthquake measuring 5.6 Mw. Until April 2023, BMKG recorded that aftershocks occurred 448 times with a magnitude range of 1 - 4.2 Mw. This event occurred due to underground movement caused by a fault or fault. The fault that has been identified in the Cianjur area is the Cimandiri fault, however, the epicenter of the earthquake and the location of the Cimandiri fault line are approximately 20 km away. BMKG indicated that there was a new fault that was the cause of the earthquake. This research aims to determine subsurface conditions with indications of active faults in the areas affected by the 2022 Cianjur earthquake. Data acquisition was carried out at Cibulakan and Firdaus Mosque using the GPR method. The GPR method used is GSSI - SIR 3000 with a 270 MHz frequency antenna. Data processing was carried out using GPRpy software. Based on the processing that has been carried out, there are indications that the fault stretches perpendicularly in a north-south direction at a depth of approximately 2 m below the ground surface. Apart from that, the rock that makes up the area is volcanic rock.

Keywords: active faults, Cianjur earthquake, groundpenetrating radar (GPR), subsurface structures

ABS-120

Design and Manufacturing of a Laboratory Scale Concrete Roof Tile Dryer

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There are some problems with the drying process in the concrete tiles local industry, especially due to uncertain weather, where the drying process relies on sunlight. In addition, roof tile dryers have not yet hit the market. A laboratory-scale dryer is needed to develop a full-scale concrete roof tile dryer. This research aims to design and manufacture a laboratory-scale concrete tile dryer to investigate the characteristics of the drying process. This research was carried out using the Pahl and Beitz method, in three stages, namely planning, conceptual design, and detailed design. In the planning stage, a requirement list was stated, in the conceptual design stage, selected tools are determined for every sub-function, while in the detail design stage, shop drawings were produced. To produce a better distribution of air velocity and temperature, at this detailed design stage, a Solidworks CFD numerical analysis was used. The dimension of the drier is 1600 x 1100 x 1100 mm³, with a capacity of 60 - 180 kg, and with air velocity of 3 m/s and variable temperature. The drying chamber consists of 3 layers. The heat source is LPG flame and electric heater. The fresh air is flown to the LPG burner, through a circulating fan into the drying chamber, where the concrete roof tiles are situated. The roof tile dryer was manufactured and tested. The test results show that the air velocity at the top layer accorded with the CFD result, while in layer 2 and layer 3 of the drying chamber, the air velocity was relatively small. The temperature in each layer of the drying chamber shows the same value, in this case, the temperature for each layer is 38 Celcius degree., while the set point at the thermostat was 40 Celcius degree.. The relative humidity of the drying air was 21.7 percent.

Keywords: Concrete roof tile- dryer- CFD- temperature- velocity.

ABS-121

Structure Planning of 13470 DWT Capacity Jetty on Liquid Berth II Caspian Sea, Turkmenistan

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Liquified Natural Gas is one of the products produced from refineries in the Caspian Sea. LNG production increases due to demand, causing the addition of new offshore platforms. To provide loading and unloading services for LNG, a special dock is needed, for this reason a special liquid bulk jetty with a capacity of 13470 DWT is planned. Structural planning using STAADPRO V8i Select Series 6 software, using British standards in planning. The jetty structure is expected to be strong against the loads that work due to environmental conditions and ship impacts. Structural analysis is carried out by comparing the structures Unity Check Ratio value with the Unity Check Ratio permitted based on applicable standards. The result is that the structure is able to withstand the working load with details of 4 Breasting Dolphin structures, 2 Mooring Dolphin structures, 1 Jetty Head Platform structure, and 1 Trestle structure.

Keywords: Jetty, LNG, Unity Check Ratio

ABS-122

Performance Comparison of DME and R134a Refrigerants in a Room Air Conditioner: Effect of Subcool and Superheat

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The demand for environmentally friendly refrigerants arises to anticipate two global environmental issues: global warming and climate change. The use of environmentally friendly refrigerants is one of the efforts to address these issues. This study aims to investigate the possibility of the use of dimethyl ether (DME) for substituting R134a that has been widely used worldwide. The simulation reveals that both subcooled and superheat affect the performance of both refrigerants. The cooling capacity of R134a system increases with the increase of subcooled and superheat. Meanwhile, even though the cooling capacity of DME increases with the increase of subcooled, it decreases with the increase of superheat. For subcooled 0 deg. C, DME has a coefficient of performance (COP) 4.8 percent higher than that of R134a although the cooling capacity is 4.5 percent lower. When the subcooled is set at 8 deg. C, the cooling capacity of DME is 6.5 percent lower than R134a but the COP is 2.6 percent higher. Another important finding in this study is that the best performance of DME over R134a is obtained at low subcooled and low superheat.

Keywords: air conditioner, dimethyl ether (DME), R134a, Substituting, COP

ABS-123

Hydrogeological Conceptual Model in The Batang Integrated Industrial Park, Central Java, Indonesia

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The construction of Batang Integrated Industrial Park (BIIP) will surely affect the groundwater in this area and its surroundings. To estimate the impact of changes in land use and the potential use of industrial water from groundwater, a hydrogeological conceptual model has been constructed for the BIIP. The methodology involves gathering rainfall data to estimate potential recharge. The secondary and primary data of deep and shallow wells were used to evaluate the boundaries of groundwater flow directions and develop the geometry of the aquifer system. The boundary condition observation data, geophysics data, drilling log, and slug test results were collected and interpreted in a 2-dimensional as a conceptual model of the hydrogeological condition. The result reveals that groundwater flow boundaries are Java Sea in the North as a constant head boundary, Brontak River in the west, Pesanggrahan River in the east as a river boundary, and Srigunung hills in the south as a no-flow boundary. The aquifer system of the area is dominated by sand as an unconfined aquifer with a thickness maximum of 88 m and located up to 47 m below the surface. The recharge in the research area is approximately 950.5 mm/year. The hydraulic conductivity of the aquifers is 0.16 m/day to 0.401 m/day. This hydrogeological conceptual model provides essential information for numerical groundwater models.

Keywords: Groundwater, Conceptual Model, Batang Integrated Industrial Park



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