ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT

DEPARTMENT OF CIVIL ENGINEERING

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DEPARTMENT OF CIVIL ENGINEERING

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ADITYA

Institute of Technology and Management
(An Autonomous Institution)

Tekkali-532 201, Srikakulam Dist., AP
Tel: 0845-245666, 245266, 92466 57908
Email: info@adityatekkali.edu.in

ADITYA

Institute of Technology and Management

(An Autonomous Institution)

Department of Civil Engineering

Vision and Mission of the Institute

Vision

To evolve into a premier engineering institute in the country by continuously enhancing the range of our competencies, expanding the gamut of our activities and extending the frontiers of our operations.

Mission

Synergizing knowledge, technology and human resource, we impart the best quality education in Technology and Management. In the process, we make education more objective so that efficiency for employability increases on a continued basis.

Vision and Mission of the Department

Vision

To become a pioneer in the field of civil engineering by providing high quality education and research to serve the public consistently with competitive spirit professional ethics.

Mission

Provide quality knowledge and advance skills to the students in order to expertise theoretically and practically in the areas of civil engineering.

Improve the professional potentiality of the students and staff through educational programs to expand the knowledge in the field of civil engineering.

Inculcate healthy competitive spirit towards the higher education and successful career in the field of civil engineering to serve the nation ethically.

Provide students and faculty with opportunities to create, disseminate and apply knowledge by maintaining a state of the art research.

Chairman's Message

At AITAM, we are committed to excellence in everything we do. We strive to mould the students in balancing intellectual and practical skills to become leaders in all the fields of Technical know-how and Management. We have created the finest facilities for the students to make the most of their scholastic pursuits. We are closely aligned with the corporate world which ensures exchange of ideas and experiences that keep our curricula focused on current developments and challenges in the field of engineering. We are firmly committed to research and consulting activities to contribute to the development of the discipline of engineering. Our vitality lies in our spirit of innovation. Our strength lies in our pragmatic approach. Our success lies in our will to do.

Dr. K. Someswara Rao
CHAIRMAN

Secretary's Message

Aditya Institute of Technology and Management is founded to meet the increasing demand for competent engineering graduates. Within a short span of its inception, AITAM has grown to be a premier engineering college of its kind and has won laurels and kudos from the industry. The faculty and staff in AITAM are dedicated to providing first-class education that instills strong and potent basic knowledge for sound practice in science and engineering for the well-being of the society. The Institute offers curricula that nurtures creative thinking and prepares students for productive and rewarding careers. The Institute offers programmes that deepen learning experiences of our students and prepare them for successful careers as engineers.

Sri L.L. Naidu
SECRETARY

Director's Message

Engineering education at AITAM is indeed a rewarding intellectual experience. The Institute prepares the engineering professionals of tomorrow imbued with insight, imagination and ingenuity to flourish as successful engineers. Our programs are attuned to the needs of the changing times. The classrooms are ultra-modern; the library and labs are cutting-edge; and all the members of the faculty are workaholic professionals and masters in their fields. Not surprisingly, our students are recruited by such renowned organizations as HCL, Satyam, WIPRO, INFOSYS, TCS, Visual Soft, Innova-Solutions and InfoTech. The exceptional dedication of our students, faculty and staff, and our collaborations with Industry and other institutions ensure that the Institute is well-poised to create a unique niche in the horizons of engineering education.

Prof. V.V. Nageswara Rao
DIRECTOR

Principal's Message

It is only through knowledge that man attains immortality. Knowledge has to expand or grow to remain as knowledge. The road to excellence is toughest, roughest and steepest in the Universe. The world requires and honors only excellence. Available information has to be directed by wisdom and intelligence to create new knowledge. Promotion of creativity is the new role of education. It is only through creative thinking that the present and future problems can be addressed to find dynamic solutions. Technology should be used to help remove poverty from the world. In fact forty per cent of the world's poor are in India. Confidence leads to capacity. It is faith in oneself that produces miracles. Education at AITAM helps build character, strengthen the mind, expand the intellect and establish a culture of looking at problems in a new perspective. The student is put through rigorous training so that he can stand on his own feet after leaving the portals of the Institute.

Dr. A. S. SRINIVASA RAO
PRINCIPAL

HOD's Message

Welcome to the Department of Civil Engineering at AITAM, Tekkali. Our journey started in the year 2011. Over the past 6 years we have grown our competency and expertise in core Civil Engineering curriculum and research. Vision of the department is to become a pioneer in the field of civil engineering by providing high quality education and research to serve the public consistently with competitive spirit and professional ethics.

The primary focus of our curriculum is to impart technical know-how to students, improve their problem skills combined with innovative thoughts. The department is well equipped with state of the art laboratories for academics and research purpose. With funding from Technical Education Quality Improvement Program (TEQIP) and AICTE, special purpose lab equipment and software have been procured to support the research activities. Faculty members have excellent academic credentials possessing Doctorates and experienced staff from academics, research and core industry.

Dr. P. DINAKAR

HOD, CIVIL DEPARTMENT

Abstracts of B.Tech. Projects

S.No.	01
Name of the guide	Sri G. ANIL KUMAR
Name of the Student	PINDI PATTABHI (21A51A0172) KALISETTI ROHIT (22A55A0123) MAKKA KIRAN (21A51A0151) S.HEMANTH KUMAR (21A51A0166) LALIT KUMAR SAH (21A51A01A2)
Project Title	AN EXPREMENTAL STUDY ON STRENGTH PARAMETER OF CEMENT STABILIZED INDUSTRIAL WASTE WITH VARIOUS CURING ENVIRONMENTS

Abstract: This study explores the effect of different curing environments (No, water, and moisture curing) on cement-stabilized industrial waste. Industrial wastes fly ash were stabilized using cement in different proportions. The cured samples were tested for unconfined compressive strength over a specified curing period. Results showed that curing environment significantly influenced the material properties, with water curing demonstrating the highest compressive strength. No curing led to lower strength compared to water and moist curing. Moist curing exhibited moderate performance in strength and. The study highlights the importance of selecting an optimal curing method for cement-stabilized industrial waste. The findings can help improve the utilization of industrial waste in construction. Proper curing techniques can enhance material performance and contribute to sustainable construction practices. This research provides useful insights for future applications in the field of waste management and construction engineering.

S.No.	02
Name of the guide	Sri R. CHANDRASEKHAR, Sri G. ANIL KUMAR
Name of the Student	MUDDADA SWETHA (21A51A0162) PRITHIVI NARAYAN CHAUDHARY (21A51A01A7) GEDELA SAI KUMAR (21A51A0174) PANGA MALAVIKA (21A51A0150) RAJANISH KUMAR YADAV (21A51A0196)
Project Title	AN EXPERIMENTAL STUDY ON THE EXPANSIVE SOIL STABILIZATION WITH FLYASH AND CEMENT

Abstract: Expansive soils pose significant challenges in geotechnical engineering due to their high shrink-swell potential, leading to structural instability and increased maintenance costs. This experimental study investigates the effectiveness of fly ash and a commercially available binding agent in stabilizing expansive soils. Soil samples were collected and subjected to a series of laboratory tests are performed and evaluate their index and engineering properties like Atterberg limits, free swell index (FSI), compaction characteristics, and unconfined compressive strength (UCS). before and after stabilization. Soil was stabilized with Fly ash in various proportions (25%, 50%, and 75%) and binding material as Cement in 5% and 10%. Those stabilized samples are tested and evaluated the optimal mix proportions. The results indicate a significant improvement in strength parameters and a reduction in swell potential with the combined use of fly ash and the binder. By considering all the mix results, it is concluded that the strength gets greater improvement at the mix of S50 FA50 C10 at 30% moisture content. The study concludes that the synergistic use of fly ash and binding agents is a sustainable and eco-friendly for improving the performance of expansive soils in civil engineering applications.

S.No.	03
Name of the guide	Smt. V. DIVYASRI
Name of the Student	SUBHASH CHANDRA YADAV (21A51A01A1) DHARMANA LOKESH (21A51A0149) GEDELA VENU MADHAVI (21A51A0170) GEDELA VENU MADHAVI (21A51A01A6) CHALLA NITHIN KUMAR (21A51A0164)
Project Title	STUDY ON STRENGTH CHARACTERISTICS OF GEOPOLYMER CONCRETE BY TAKNG ALKALI AS MEDIUM

Abstract: Alkali Activated Concrete (AAC) using Ground Granulated Blast Furnace Slag(GGBS) silica fume, gypsum, sodium silicate (Na_2SiO_3) and NAOH as precursors attracted several researchers in developing without cement concrete. GGBS as precursor avoids temperature ambient curing, but setting is too fast when compared with conventional or ordinary Portland Cement. Many researchers have used the combination of GGBS silica fume, gypsum, sodium silicate (Na_2SiO_3) as precursor in developing AAC. The plentily available resources, and use of sodium silicate Na_2SiO_3 has to be encouraged for developing sustainable concrete. Thus, an experimental attempt has been made to examine the use of sodium silicate Na_2SiO_3 to some extent in the AAC. The present paper examines the used of sodium silicate Na_2SiO_3 and gypsum along with GGBS and silica fume as precursor in developing AAC. 16M and 17M Sodium hydroxide and sodium silicate solution has been used as alkaline activator. Consistency, setting times and compressive strength of these mixes has been reported. It found that sodium silicate Na_2SiO_3 and gypsum addition has increased the consistency as well as setting times. It has suggested that precursor with 80% GGBS, 20% silica fume showed good compressive strength. With the addition of gypsum 5% of the total quantity of binding materials ,that lowered the compressive strength of the mix.

S.No.	04
Name of the guide	Sri G.D.R. NAIDU
Name of the Student	SUNKANA DHARANI (21A51A0185) IPPILI JAYARAM (21A51A0153) MANDALA MANOJ KUMAR (22A55A0124) ARANGI SIVA PRANEETH (21A51A0193) MALLA ROSHINI (21A51A0169)
Project Title	AN EXPERIMENTAL STUDY ON STRENGTH CHARACTERSTICS OF FIBER REINFORCED CONCRETE COLUMNS OF DIFFERENT L/D RATIOS RETROFITTED BY GFRP

Abstract: Concrete is widely used for its durability and cost-effectiveness, but it lacks tensile strength and ductility, especially under seismic or dynamic loads. To improve this, fiber-reinforced concrete (FRC) is used, but columns with high length-to-diameter (L/D) ratios remain vulnerable to failure. GFRP (Glass Fiber Reinforced Polymer) retrofitting enhances concrete's strength, ductility, and load-bearing capacity. GFRP's high strength-to-weight ratio and corrosion resistance make it ideal for structural rehabilitation. It improves seismic performance, energy absorption, and longevity of deteriorated structures. However, GFRP is costly and its effectiveness depends on proper installation and surface preparation. Experimental results may not fully represent real-world conditions. GFRP's long-term durability and performance under sustained loads are still under research. Despite its advantages, GFRP materials may face challenges like sensitivity to temperature and fire risks. Nonetheless, GFRP retrofitting is an efficient solution for enhancing concrete columns' safety and resilience.

S.No.	05
Name of the guide	Dr. B.V. REDDY , Sri G. ANIL KUMAR
Name of the Student	PODILAPU SAI HARSHINI (21A51A0152) JAMI AKHILA (21A51A0155) KANUGULA SRI VIDYA (21A51A0176) KORNENA KAVYA (21A51A0194) ANDAVARAPU SAI SWAROOP (21A51A0175)
Project Title	SOIL STABILIZATION OF CHEMICALLY TREATED PALM FIBER REINFORCED SOILS

Abstract: Expansive soils, known for swelling and shrinking with moisture changes, pose major geotechnical challenges by compromising structural stability. This study explores stabilization using natural palm fibers, both untreated and chemically treated with 1.5 M sodium hydroxide (NaOH) and hydrogen peroxide (H_2O_2). Reinforcement was assessed at 0.5% and 1.0% fiber content by soil weight. Unconfined Compressive Strength (UCS) and Split Tensile Strength (STS) tests were conducted before and after 7, 15, and 30 days of degradation. Results show that chemical treatment significantly improves fiber durability and bonding, leading to a 43–45% increase in UCS and a 47–50% increase in STS degradation resistance. These improvements are due to the removal of lignin and hemicellulose, enhanced surface texture, and stronger fiber–soil adhesion. The study concludes that alkali-oxidative treated palm fibers offer a cost-effective, eco-friendly, and sustainable alternative to synthetic stabilizers for reinforcing expansive soils, especially in areas rich in agricultural waste.

S.No.	06
Name of the guide	Sri KRUPASINDHU BISWAL
Name of the Student	TAMMINENI RAJESH (22A55A0121) NARTHU GAYATHRI (21A51A0187) YALALA DEVISRI VINAYAKI (21A51A0181) ALATI BHARAT KUMAR (21A51A0192) THOTA RAMU (21A51A0189) BODDEPALLI AKHILA (21A51A0177)
Project Title	FLOOD HYDROGRAPH ANALYSIS USING SYNTHETIC UNIT HYDROGRAPH,HEC-HMS & HEC-RAS

Abstract: Flood hydrograph analysis in the Vamsadhara Basin, a region prone to significant flooding, is critical for effective flood management and mitigation. This study investigates the application of synthetic unit hydrographs, HEC-HMS, and HEC-RAS for flood hydrograph analysis within this basin. Synthetic unit hydrographs, generated using empirical relationships, provide an initial estimation of flood response for ungauged sub-basins in the Vamsadhara Basin. HEC-HMS (Hydrologic Modeling System) offers a more detailed approach by simulating the rainfall-runoff process based on catchment characteristics, rainfall data, and land use patterns specific to the Vamsadhara Basin. HEC-RAS (Hydrologic Engineering Center's River Analysis System) further enhances the analysis by modeling the hydraulic behavior of river channels, assessing flood propagation, and mapping inundation areas. The study integrates these methodologies to evaluate their performance in predicting flood hydrographs and assessing flood risks in the Vamsadhara Basin. It was determined that HEC-HMS produced 50% higher discharge compared to SUH. Similarly, HEC-HMS exhibited a 33.3% greater discharge than HEC-RAS.

S.No.	07
Name of the guide	Dr. V. SOWJANYA VANI
Name of the Student	SHARIF MANSURI (21A51A01A0) VORISI SARATH (21A51A0159) GHANSHYAM CHAUDHARY (21A51A0148) SURABATTULA SAI DEEPAK (21A51A0195) UPPADA ASHISH (21A51A0191) PALLI GIRISH (22A55A0127)
Project Title	DURABILITY STUDY ON SELF COMPACTING GEOPOLYMER CONCRETE

Abstract: Concrete is the material which is most utilised after water and requires surplus quantity of Portland cement. Portland cement is produced with the consumption of huge amount of energy, and also leads to enormous emission of carbon dioxide (CO_2) and other harmful greenhouse gases. Hence, it becomes important to find a substitute to the existing one. Geopolymer concrete is a unique kind of concrete that do not use Portland cement in its preparation and greatly reduces CO_2 emissions and is also resilient to most of the durability issues. Geopolymer concrete is an environmental friendly concrete as it relies on minor treated natural materials or industrial wastes like (Fly ash, GGBFS and silica fumes etc.,) which are having high alumina and silica content, to significantly reduce the carbon footprints. The issue of disposal of such industrial wastes can also be resolved to great extent as their disposal causes land pollution. Alkaline solution, made by mixing sodium silicate (Na2SiO3) and sodium hydroxide (NaOH) or potassium silicate (K2SiO3) , is used to activate these cementitious binders. Self compacting geopolymer concrete (SCGC) is developed to overcome failure due to lack of adequate compaction. SCGC is an improved form of concrete that compacts under its own weight without the need for extra compaction. The durability studies are conducted and Self compacting geopolymer concrete (SCGC) concrete exposing to Sulphuric acid and hydrochloride acid solution. The ages of exposure are 1, 2, 3 months duration. The results are compared with conventional concrete cubes.Self-compacting geopolymer concrete (SCGPC) demonstrates comparable durability to ordinary Portland cement (OPC) concrete under acid exposure, showing a total strength loss of 13.5% in HCl and 22.5% in H_2SO_4 compared to 14.6% and 23.7% respectively in OPC. Overall, SCGPC retained approximately 77.5%–86.5% of its strength, indicating good durability performance and suitability for aggressive environmental conditions.

S.No.	08
Name of the guide	Dr.B.GOVINDA RAJULU
Name of the Student	YAJJALA LAKSHMI PRASANNA (21A51A0183) PINNINTI LAVANYA (21A51A0158) MOGILI SWATHI (21A51A0180) DOKI SAI GAYATHRI (21A51A0157) PAKALA PRIYAMVADA (21A51A01A5) DIKKALA ABHISHEK (21A51A0179)
Project Title	EXPERIMENTAL INVESTIGATION ON CONCRETE STRENGTHS BY USING SUSTAINABLE CEMENTITIOUS MATERIALS

Abstract: This study investigates the different strength performance of high-performance concrete (HPC) incorporating partial replacement of cement with Ground Granulated Blast Furnace Slag (GGBS) and sand with Manufactured Sand (M-sand). The research explores the structural and environmental benefits of using industrial by-products in HPC.HPC specimens are prepared with GGBS (10%, 20%, 30%, 40%,50%,60%) and M- sand (100%) replacements and tested for mechanical properties. Standardized tests evaluated compressive strength and Split tensile Strength. Results are compared with conventional HPC to assess improvements. The study demonstrates enhanced sustainability, and structural performance of HPC with these replacements.

S.No.	09
Name of the guide	Sri G. GOWRISANKARA RAO
Name of the Student	KARRI GAYATRI (21A51A0154) SAHUKARI AKSHAY (21A51A0122) RUNKU SAIKIRAN (21A51A0178) AVANAPU GOPI (21A51A0165) PODILAPU HEMANTH KUMAR (21A51A0156) SHAIK ABDUL KALAM(21A51A0188)
Project Title	AN EXPERIMENTAL STUDY ON STRENGTH PROPERTIES OF M30 GRADE TERNARY CONCRETE

Abstract:
Concrete is one of the most widely used construction materials, but its production has significant environmental impacts due to high cement usage and the excessive extraction of natural sand. This study focuses on making concrete more sustainable by partially replacing cement with bagasse ash (BA) and rice husk ash (RHA) and replacing fine aggregate with stone dust (SD) in M30 grade concrete. Bagasse ash is a byproduct of sugarcane processing, and rice husk ash comes from burning rice husks. Both materials are rich in silica, which helps improve the strength and durability of concrete. Stone dust, produced during stone crushing, can replace natural sand, reducing environmental damage caused by sand mining. This research involves testing different combinations of these materials in concrete to evaluate their effects on workability, compressive strength, tensile strength. The results show that using these replacements in proper proportions improves the overall performance of concrete while reducing cement and sand usage. This study demonstrates that agricultural and industrial waste materials can be effectively used in construction, making concrete more eco-friendly without compromising its strength.

S.No.	10
Name of the guide	DR. SANJAY KUMAR RAY
Name of the Student	ASAPU TEJA (21A51A0163) DHARMANA HIMABINDU (21A51A0184) SUSHANT CHAUDHARY (21A51A01A8) KOYALAPU RAMMOHAN (21A51A0171) REYYA RAHUL (21A51A0167) MONANGI HEMANTH KUMAR (22A55A0126)
Project Title	AN INTIGRATION OF GIS AND MCDA FOR SUSTAINABLE URBAN SETTLEMENT

Abstract: The Land demand for future urban residential construction is growing faster because of urban population Expansion. Without proper planning, rapid urbanization may put significant stress on Ecosystems. This study presents an integrated framework combining multi-criteria decision analysis (MCDA) and Geographic information systems (GIS) for sustainable urban Settlement planning. Through this research wok, sixteen input thematic maps (i.e., Land use and Land cover, Slope, Population Density, Drainage Density, Euclidean Distance Road, Euclidean Distance Railways, Geology, Soil Type, Euclidean Distance Health Services, Euclidean Distance Industries, Elevation, Euclidean Distance Market Place, Flood Prone Area, Lineament Density, Euclidean Distance Religious and Institution, Ground Water Recharge Priority) are utilised. The input thematic maps are verified for multicollinearity, overlaid in ArcGIS with ranked assignment's using Analytical Hierarchy Process (AHP) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to develop sustainable urban settlement suitability map. It was found that 16%, 32%, 26%, 20%, and 6% of the research region are having Very High, High, Moderate, Low, and Very Low suitability for urban settlement, respectively. This study analyses hazard susceptibility models' sensitivity, highlighting the significant impact of LULC, Slope, and Population Density. By removing specific maps causes shifts in urban settlement zones, affecting hazard assessments. This study aids sustainable urban planning by optimizing land use, reducing ecological stress, enhancing resilience, and supporting policymakers in hazard mitigation.

S.No.	11
Name of the guide	Dr. P. DINAKAR
Name of the Student	BARATAM CHARULATHA (21A51A0173) SIKENDRA SADA (21A51A0199) MANDALA BHARGAV VARA PRASAD (21A51A0161) BABLU NIRALA (21A51A0198) LOTUGADDA MANIKANTA (21A51A0160) BORA ASHITHA (21A51A0182) G. SIVA SAGAR (20A51A0167)
Project Title	EXPERIMENTAL STUDY ON PERFORMANCE OF R.C.C BEAMS WITH CHANGE IN STIRRUP SCHEME

Abstract: The performance of shear reinforcement is determined by the ultimate shear strength, service load, deflection, crack patterns and mode of failure. The shear reinforcement is provided in different forms. In general, vertical stirrups are most commonly used as shear reinforcement, for the simplicity in fabrication and installation. This investigation has been performed to compare the shear resisting capacities between beams with vertical stirrups and stirrups with welding . A total two reinforced concrete beams are fabricated and casted with concrete and tested under two- point bending after 28 days. To evaluate the shear performance, the beams must be designed for the same shear strength. A comparative study is made between these two beams pertaining to the ultimate strength, deflection and crack widths. It is observed that the performance of the beam with welded stirrups has shown better results.

S.No.	12
Name of the guide	M. SAI BABU
Name of the Student	BHARGAVI (21A51A0118) MOHAN NAIDU (21A51A0129) USHA RANI (21A51A0139) GOVARDHANA RAO (21A51A0144) DHARMA TEJA (22A55A0109)
Project Title	PREDICTING THE COMPRESSIVE STRENGTH OF CONCRETE BY USING MACHINE LEARNING TECHNIQUES

Abstract: Predicting the compressive strength of concrete remains a challenging task due to the complex correlation of factors such as aggregate characteristics and the water-cement ratio. This study explores the use of machine learning (ML) algorithms to predict the compressive strength of concrete incorporating sugarcane bagasse ash (SCBA) and silica fume (SF). A dataset comprising 132 samples sourced from existing literature is utilized, with key input variables including cement content, fine aggregate (FA), coarse aggregate (CA), SCBA, SF, water content, and curing time. Three ML models—linear regression, decision tree, and random forest—are developed and evaluated based on performance metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE), and the coefficient of determination (R^2). Among the models, the random forest algorithm demonstrates greater predictive capability, achieving an R^2 of 0.74, RMSE of 8.23 MPa, and MAE of 6.28 MPa. In contrast, the linear regression model exhibits the lowest accuracy, with an R^2 of 0.50, RMSE of 11.46 MPa, and MAE of 8.34 MPa. The findings highlight the potential of machine learning model, particularly the random forest model, as a reliable and efficient tool for predicting concrete compressive strength, thereby minimizing the need for extensive laboratory testing. This study also examines the compressive strength of M30-grade concrete incorporating 10% silica fume and varying proportions of sugarcane bagasse ash (SCBA), ranging from 10% to 50%, as partial cement replacements. Compressive strength is evaluated at curing ages of 7, 28, 56, and 90 days to assess both early-age and long-term performance. Based on the experimental results, it is concluded that the highest compressive strength in M30-grade concrete is obtained by incorporating 10% sugarcane bagasse ash (SCBA) and 10% silica fume, leading to enhanced strength performance at both early and later curing ages compared to other mix ratios.

S.No.	13
Name of the guide	SRI. S. RAM LAL
Name of the Student	P. KUSUMA (21A51A0110) P.HARITHA (21A51A0108) B,HARA CHANDRA (21A51A0146) G.MUKUNDHA RAO (21A51A0145) S.SAI TEJA (22A55A0107)
Project Title	AN EXPERIMENTAL STUDY ON PARTIAL REPLACEMENT OF CEMENT WITH ZEOLITE POWDER AND FINE AGGREGATE AND ZEOLITE SAND

Abstract: This project investigates the use of zeolite powder and zeolite sand as partial replacements for cement and natural sand in concrete production. Zeolite, a naturally occurring alumino silicate, is explored for its potential to enhance the sustainability and performance of concrete. The study involves substituting cement and sand with varying proportions of zeolite-based materials to evaluate their effects on workability, compressive strength, and durability. Experimental results indicate that zeolite improves the concrete's resistance to chemical attacks and contributes to a reduced carbon footprint. An optimal mix ratio is identified, achieving a balance between strength and environmental benefits. The findings demonstrate that incorporating zeolite in concrete can support greener construction practices while preserving structural integrity, making it a promising alternative for sustainable building materials.

S.No.	14
Name of the guide	Dr. G. PRASANNA KUMAR
Name of the Student	D. SAI SARANYA (21A51A0132) A. HARIKA SRI (22A55A0111) Y. BHARGAVI (22A55A0110) K. TEJASWAROOP (21A51A0107) P. GANESH (21A51A0112) S. TARUN KUMAR (22A55A0108)
Project Title	INFLUENCE OF ALCCOFINE AND GRANITE DUST ON STRENGTH PROPERTIES OF M40 GRADE CONCRETE

Abstract: Concrete is the most widely used material in all the construction activities and so resulted in scarcity for future development. The scarcity of raw materials of concrete is balanced by utilization of different alternatives such as by products form various industries resulting towards sustainable development. The commonly used alternatives of cement from the previous studies are fly ash, GGBS, Metakaolin, micro silica. Due to the high demand of concrete material, search for substitutes are carried out for cement. Hence in order to develop a new concrete with improved properties, cement is replaced with Alccofine and Granite dust in the present study. And also Conplast SP550 is used as super plasticizer in concrete to maintain the workability. The grade of concrete adopted in the study is M40 grade. Cement is replaced with granite dust by 10, 20, 30, 40 and 50% respectively and also replaced with alccofine by 5,10, 15, and 20 % respectively. The optimum content of granite dust and alccofine are obtained from the compressive strength. The mechanical properties of concrete are evaluated at various curing periods for the optimum concrete mixes and are compared with the conventional concrete. Non-destructive testing such as rebound hammer and ultrasonic pulse velocity methods are also performed for the optimum concrete mixes and final conclusions are drawn.

S.No.	15
Name of the guide	Sri. R. CHANDHRA SHEKHAR , SRI. G. ANIL KUMAR
Name of the Student	B.ROHITH SETTI (22A55A0112) V. SAI PAVAN (21A51A0113) P.KRISHNA RAO (21A51A0104) P.SURESH (21A51A0122) A.CHANTI (21A51A0109) P.SIDDU (21A55A0138)
Project Title	EFFECT OF POLYPROPYLENE FIBRES ON STRENGTH CHARACTERISTICS OF CEMENT AND FLY ASH STABILIZED EXPANSIVE SOILS

Abstract: Expansive soils exhibit significant volume instability, posing challenges in construction. This study explores the effects of artificial fibers on the compressive and tensile strength of expansive soils stabilized with binders like cement and flyash. This project focuses on selecting suitable fibers, determining optimal binder proportions, and designing experiments to evaluate mechanical performance. The integration of fibers with binders is hypothesized to enhance strength and reduce swelling. Preliminary results aim to assess the feasibility of fiber-reinforced stabilized soils in improving structural performance. This research seeks to contribute to innovative soil stabilization techniques for engineering applications.

S.No.	16
Name of the guide	Dr.B.GOVINDA RAJULU
Name of the Student	P.SRAVANTHI (22A55A0103) G.SAI NITHIN (21A51A0116) T.VENKATESWARARAO (22A51A0104) M.SAI VAMSI (21A51A0133) K.NERENDRA (21A51A0147) K.SAI KUMAR (21A51A0126)
Project Title	EXPERIMENTAL INVESTIGATION OF RCC BEAM PERFORMANCE USING SUSTAINABLE CEMENTINOUS MATERIALS WITH SUPPLEMENTARY SPIRAL REINFORCEMENT

Abstract: This study investigates the shear performance, stiffness of M55 high-performance concrete (HPC) incorporating partial replacement of cement with Ground Granulated Blast Furnace Slag (GGBS) and River sand with Manufactured Sand (M-sand). The research explores the structural and environmental benefits of using industrial by-products in HPC. Spiral reinforcement is added to enhance shear strength and ductility. HPC specimens were prepared with GGBS (50%) and M-sand (100%) replacements and tested for mechanical properties. Standardized tests evaluated compressive strength, split tensile strength, and shear capacity. Results were compared with conventional HPC to assess improvements. The study demonstrates enhanced sustainability, and structural performance of HPC with these replacements. Spiral reinforcement significantly boosts shear resistance and confinement at a higher load of 210 kN Initial shear cracking occurred compared to the conventional beam 175 kN at 28days .Initial shear cracking occurred at a higher load 355 kN compared to the conventional beam 255kN at 56 days. This research provides insights into sustainable construction practice using advanced materials.

S.No.	17
Name of the guide	Smt. V.DIVYA SRI
Name of the Student	S.SIMHACHALAM (22A55A0105) J.KAVYA (21A51A0106) B.SREEKAR (22A55A0114) T.UPENDRA (22A55A0106) B.DHARMA RAO (21A51A0140) D.CHANDRA SEKHAR (22A55A0117)
Project Title	EXPERIMENTAL STUDY ON THE STRENGTH CHARACTERISTICS OF ALKALI-ACTIVATED SLAG CONCRETE

Abstract: The construction industry is increasingly seeking sustainable alternatives to traditional Portland cement due to its significant carbon footprint. Alkali-activated slag (AAS) concrete emerges as a promising solution, Utilizing industrial by-products to create a high-performance, Eco-friendly binder. This project investigates the strength characteristics of AAS concrete, Focusing on its compressive strength, Flexural strength, tensile strength. The study involves the preparation of concrete samples using Ground granulated blast furnace slag (GGBS),and also silica fume And gypsum as binders activated with various alkaline solutions, Such as sodium Hydroxide (NaOH) and sodium silicate (Na_2sio_3).This experiment is done with Molarity M18 & M19, Based on the test results, The optimum Mix is chosen for the casting of beams. It exhibits a compressive strength that is 35.01% higher and a split tensile strength that is 35.94% higher than that of traditional Portland cement concrete. Additionally, it shows a 44.39% reduction in deflection, indicating greater stiffness and durability.

S.No.	18
Name of the guide	Dr. D. HIMA CHANDAN
Name of the Student	P. VENKATA LAKSHMI (21A51A0105) D. JYOSHNA (21A51A0125) P. AKASH (22A55A0116) N. JEEVAN KUMAR (21A51A0121) G.SRIRAM (21A51A0134) K. KIRAN (21A51A0137)
Project Title	SEISMIC ANALYSIS OF ASSUMED BUILDING BY IS 1893:2023 (DRAFT) AND IT'S COMPARISON WITH IS 1893:2016

Abstract: The seismic safety of existing RCC buildings is a critical concern, especially with the evolving design standards in India. This study focuses on the seismic analysis of an existing RCC building using the provisions of IS 1893:2023 and compares it with the previous standard, IS 1893:2016. Evaluates key parameters such as base shear, and how the latest revisions impact structural behavior. Many older buildings were designed according to previous codes, making it necessary to determine their adequacy under updated seismic loading conditions. The comparative analysis helps identify potential gaps in the existing structures and highlights the need for retrofitting or modifications to meet current safety standards.

S.No.	19
Name of the guide	B. GANESH
Name of the Student	P. AKHILA (22A55A0102) J. PRIYANKA (21A51A0102) P. PAVITRA (22A55A0115) R. LEELA MOHAN (21A51A0111) G. VINEEL KUMAR (21A51A0114) K. HARSHA VARDHAN (21A51A0131)
Project Title	EXPERIMENTAL STUDY ON STABILITY OF GEOREINFORCED EMBANKMENT

Abstract: Embankments are widely used to protect people and properties from high inflow of floodwaters. Geo-grids are used as a reinforcement material to stabilize embankments and control failure and improving overall embankment performance . This study focuses on modeling the embankments slope constructed with sand by reinforcing with geo- grids and without geo-grids. The embankment slope constructed with different angles of 45° 60° 70° are considered. The geo-grids are placed by varying spacings of H/12, H/4,H/6 by varying anchorage lengths of lo/2, Lo/4 c m. The variation of factor of safety is studied for different conditions and slope stability analysis for different slope angles is studied.

S.No.	20
Name of the guide	Sri. G. ANIL KUMAR
Name of the Student	B.SAI SUPARNA (21A51A0128) P.SRAVANI SANDHYA (22A55A0120) N.KUMAR SWAMY (22A55A0118) P.SIVA KRISHNA (21A51A0103) P.SAI TEJA SWAMY (21A51A0142)
Project Title	AN EXPERIMENTAL STUDY ON IMPROVEMENT OF STRENGTH CHARACTERSTICS OF EXPANSIVE SOIL BY THE INCLUTION OF CEMENT AND NATURAL FIBERS ALONG WITH FLY ASH.

Abstract: Fly ash acquired from power stations causes removal challenges and environmental concerns. This study investigates the effective utilization of fly ash, cement, and palm fibres as stabilizing agents to enhance the engineering properties of expansive soils. Laboratory experiments are conducted to evaluate the effects of varying proportions of fly ash (25%, 50% and 75%), cement (5% and10%), palm fibres (0.5% and 1.0% by weight of soil) and various fiber lengths i.e. 3mm,5mm and 10mm on the unconfined compressive strength (UCS), liquid limit and Split tensile strength of expansive soil samples. Also, this study focused on the impact of fly ash (FA) mixed with clay soil by using natural fibers. Generally, it can be said that fly ash improved the soil stability, especially in terms of UCS, Liquid limit, ITS tests. The study contributes to the development of sustainable and cost-effective soil stabilization techniques, which are crucial for infrastructure development and environmental protection.

S.No.	21
Name of the guide	Dr. M.SURESH
Name of the Student	M.HARIKA (21A51A0120) B.KUSA KUMAR (22A55A0113) M.DEVISRI PRASAD (22A55A0101) Y.SAI GAYATHRI (21A51A0127) B.MURALI (21A51A0141) C.PADMAVATHI (20A51A0110)
Project Title	EFFECT OF SPILLWAY GEOMETRY ON FLOW CHARACTERISTICS USING ANSYS FLUENT

Abstract: The geometry of spillways plays a vital role in regulating water flow and ensuring dam safety. This study investigates the simulation of a spillway using ANSYS Fluent[1], a computational fluid dynamics (CFD) tool, to enhance hydraulic performance and flow structures in Spillway. The simulation model focuses on analyzing water flow dynamics, turbulence, and pressure distribution over the spillway structure under various flow conditions. This study simulates flow over an ogee spillway with two slopes: 0.7H:1V (Case I) and 0.75H:1V (Case II), using a detailed 10-meter high, 20-meter-long model. Case I shows higher pressure and lateral velocity (7.1 m/s), indicating less energy dissipation and greater turbulence than Case II (4.71 m/s). The realizable k-ε turbulence model effectively captured high-velocity turbulent flows. Geometry variations like slope and crest shape significantly impact pressure, velocity, and energy loss. Optimized ogee profiles enhance flow control, reduce cavitation risk, and improve spillway efficiency.

S.No.	22
Name of the guide	Dr . H. RAMA MOHAN
Name of the Student	CHINTU.HYMAVATHI (21A51A0119) BOMMALI .SRIKANTH (21A51A0101) GUJJALA.YOGINDHRA (21A51A0123) KAMARASI.MURALIMOHAN (21A51A0130) VANA .TARUN KUMAR (21A51A0136) RAVADA.DILLI (22A55A0119)
Project Title	TESTING OF EFFICACY OF TWO COAGULANTS IN REMOVING OF PHYSICOCHEMICAL PROPERTIES OF DAIRY FARM EFFLUENTS

Abstract: The dairy industry is one of the considerable sources of environmental pollution, primarily due to the large volumes of wastewater it generates, which often contains high levels of pollutants. This study examines the effectiveness of two coagulants such as alum and drumstick seed powder in improving the physicochemical properties of dairy farm effluents. Then after compares the performance of these coagulants under controlled conditions, focusing on key parameters such as turbidity, total suspended solids (TSS), pH, DO and biochemical oxygen demand (BOD). This study underscores the potential of these coagulants to enhance wastewater treatment processes, contributing to environmental sustainability. Furthermore, it evaluates the cost-effectiveness and feasibility of scaling up the use of these coagulants, providing valuable insights for the dairy industry in addressing its environmental impact.

Faculty Publications

S.No.	Academic Year	SCOPUS	SCI Journals	UGC Journals	WOS Journals	Total Journals
1	2024-2025	05	06	01	02	14

Title	A STUDY THAT EXAMINES THE DURABILITY, STRENGTH, AND SUSTAINABILITY OF FIBER-REINFORCED CONCRETE USING VARIOUS PERCENTAGES OF HOOKED STEEL FIBRE
Author	B. Govinda Rajulu & Dr. P. Dinakar
Journal	Journal of Civil and Environmental Engineering
Abstract	Concrete is the most produced of all the materials and is utilized widely in building all over the world. Today's expanding population is increasing the demand for concrete in the construction sector. However, brittleness, Concrete's utility as a structural material is limited by its low flexibility, low durability, and weak resistance to impact strength. Concrete technology is currently trending towards making concrete stronger and more durable. The primary focus of this project's investigation is the effects of steel and glass fibres in concrete. FRC is fire resistant and has a high tensile strength. Consequently, less harm will be lost due to fire-resistant qualities. Consequently, lessen the amount of damage lost in fire incidents. The FRC is included. For M25, add 0.2%, 0.4%, 0.6%, 0.8%, and 1%. Concrete test results indicate percentage improvements in compressive strength, and durability tests like acid resistance when HCl is used. These tests are conducted experimentally over 7, 14, and 28 days.

Title	ENVIRONMENTAL IMPACT ASSESSMENT OF FLORA AND ITS ROLE IN OFFSETTING CARBON ALONG NATIONAL HIGHWAY-16, INDIA
Author	Dr. H. Ramamohan, Dr. P. Dinakar, and Dr. B. Visweswara Reddy
Journal	Environmental Monitoring and Assessment
Abstract	Quick upsurge of carbon and other greenhouse gases are liable to change the global temperatures, to hold back these gases planned efforts are needed. Present study focused on National Highway-16 of Srikakulam district, which is upgraded from 4 to 6 lane standard to facilitate the traffic has stimulated concerns. This study intended to compute the carbon sequestration and storage capacity of above and below ground biomass. This helps in comparison and impact of the road project on flora and its carbon pool, from where future tree stock changes can be prepared. A total of 1930 plots were made scientifically in crisscross way of equal size (2 x 100 m), all woody trees with dbh ≥ 30cm were considered and measured their diameters. In which a total of 29 tree species belongs to 14 families were identified; the quantity of macrobiotic carbon sequestered as a whole i.e. above and below ground was 768890.29 tC; 199911.48 tC respectively. The mean sequestration rate of carbon as biomass at the above ground was 1.19 tC/ tree and below ground was 0.31 tC/ tree. The estimated average C-Stock per tree was 1.5 tC, however, the mean C-Stock per quadrate was 250.2 tC is recorded.

Title	BREEDING SUCCESS AND MORTALITY RATES IN PAINTED STORK (MYCTERIA LEUCOCEPHALA) AT TELINEELAPURAM BIRD PROTECTED AREA, INDIA
Author	Dr.Ramamohan Hanumanthu
Journal	Journal of Asia-Pacific Biodiversity
Abstract	Breeding success and mortality rate of birds are dependent on many factors. However, the availability of food resources, breeding and nesting habitats, and protection offered key to hatching and breeding success, also mortality of chicks as well. The present study illustrates breeding success and chick mortality in a large colony of Painted storks (Mycteria leucocephala), over a period of five years from 2008 to 2013 at a pelicanery in Telineelapuram, Andhra Pradesh, India. Overall breeding success during the study period was high but varied substantially over years. The recruitment rate ranged from a low of 29.26% in the period 2010–11 to a maximum of 46.74% over 2012–13 with a mean of 40.92% over five years. The rate of chick mortality was high due to factors such as (cyclones, perching activity, predation and accidents involving chicks falling out of their nests). The average mortality rate of chicks was 18.6%; however, the number of dead young birds observed ranged from 74 to 105 individuals, with a peak observed during the period 2010–11.

Title	INTEGRATION OF ARTIFICIAL NEURAL NETWORKS AND MACHINE LEARNING FOR PREDICTIVE MODELLING OF STRUCTURAL HEALTH IN CIVIL ENGINEERING CONCRETE BRIDGES
Author	Dr.Sanjay Kumar Ray
Journal	Library of Progress-Library Science, Information Technology & Computer
Abstract	Structural health monitoring (SHM) has become a crucial aspect of maintaining the safety and durability of civil engineering structures, particularly concrete bridges. Traditional methods often rely on periodic inspections and manual sensor data analysis, which can be both time-intensive and susceptible to human error. With advancements in technology, Artificial Intelligence (AI) techniques such as Artificial Neural Networks (ANNs) and Machine Learning (ML) algorithms have emerged as effective tools for predictive modeling in SHM. These AI models can process large amounts of real-time sensor data to predict key indicators like crack propagation, load-bearing capacity, and overall structural health. By providing accurate predictions, AI models enable more efficient maintenance scheduling, reducing both the risk of structural failure and unnecessary repair costs. This research explores various AI-driven models, comparing the performance of ANNs with other machine learning techniques such as Random Forest and Gradient Boosting. The findings demonstrate that AI can significantly improve the precision of SHM, offering a more scalable and cost-effective solution for infrastructure management, ultimately extending the service life of bridges while ensuring public.

Title	AI-ENHANCED PREDICTION OF PAVEMENT CRACK PROPAGATION: A STUDY USING TRAFFIC LOAD, ENVIRONMENTAL AND MATERIAL DATA
Author	Dr.Sanjay Kumar Ray
Journal	South Eastern European Journal of Public Health
Abstract	This study develops an AI-based predictive model for forecasting pavement crack propagation by integrating traffic load, environmental conditions, and material property data. Traditional pavement management systems often struggle to accurately predict crack growth due to the complex interactions between these influencing factors. By leveraging data from various sources, including sensor-based traffic metrics, meteorological data, and material composition tests, this study identifies significant variables contributing to crack initiation and progression. The proposed model utilizes a blend of machine learning algorithms, including Random Forest and neural networks, with a cross-validation approach to ensure robustness. Results indicate that the model achieves high prediction accuracy, with an RMSE of 1.2 mm/year and an R-squared value close to 0.93. The findings support the use of AI-enhanced models as reliable tools for road infrastructure planning and maintenance, promising reductions in maintenance costs and improved pavement durability.

Title	INFLUENCE OF RICE HUSK ASH & GRANITE POWDER ON STRENGTH PROPERTIES OF CONCRETE
Author	G.Gowrisankara Rao, G.Prasanna Kumar, G.Anil Kumar and Krupasindhu Biswal
Journal	Journal of Polymers and Composites
Abstract	Concrete is the mostly utilized material in the field of Civil Engineering. As its consumption is huge in amount and so the scarcity of the raw materials has become a major issue. The important components of concrete are binding material along with the aggregates. Alternative materials are chosen for the replacement of cement to achieve sustainable concrete. Along with cement replacing materials, reusable wastes are also adopted to utilize in concrete as a substitute of sand. The paper deals with the utilization of waste products rice husk ash from agricultural industry and granite powder from granite industry respectively in concrete to develop a novel concrete with sustainable characteristics. Cement is replaced by rice husk ash at constant percentage of 20% and sand is replaced by granite powder at various percentages 0, 10, 20, 30, 40 and 50 % respectively. The hardened tests on concrete specimens are performed and strengths values are compared to conclude the optimum content of granite powder. Remarkable properties are attained by converting the natural agricultural wastes to reusable raw material for concrete.

Title	UTILIZATION OF RECRON FIBERS FOR IMPROVING SUBGRADE STABILITY OF EXPANSIVE SOILS
Author	G.Anil Kumar, G.Prasanna Kumar and Krupasindhu Biswal
Journal	Journal of Polymers and Composites
Abstract	The major interest in the utilization of synthetic fibers is used as reinforcing material for developing reinforcing effect into the entire soil composition laid bellow the structures where as construction works are going on. Various articles are published on soil reinforcement, yet some of them fibers used are prepared by using with synthetic materials, one type of synthetic fibers were Recron fiber it is used as a reinforcing element to advance the soil mechanical and elastic properties. Std proctor test was performed based on IS Light weight compaction method and strength of subgrade of soil was calibrated based on CBR Test performed on different soil samples prepared with various fiber contents of 0%, 1%, 2%, 3%, 4%, 5% and 6% by weight of soil dry weight and on plain soil sample. Experimental study was demonstrated that optimal water content (OMC), ultimate dry density (MDD) and subgrade strength of soil increased with inclusion of fibrous material to the plain soil. Ultimate dry density and plastic deformation of soil may decrease with increase fiber inclusion. Moreover, the subgrade strength of soil increases upon fibers addition with all different compositions in soaked and unsoaked conditions. California bearing ratio index results also presented here to show the effect of reinforcement performance on plain soil samples. Optimum fiber dosage obtained to be 5% for all the type of tests performed here. CBRI was resulting based on CBR test results, it was shown the maximum CBRI value was obtained 3.9 and 6.5 respectively for unsoaked and soaked conditions based on these results. Reinforcement worked effectively in soaked condition then compared with unsoaked condition. The applications of recron fibers utilization improves the mechanical behaviour of expansive soil and it has more durable compare to the natural fiber reinforcement in the soil composition, performance of soil reinforcement effect has long period due to synthetic fiber addition to soil.

Title	OPTIMIZATION OF CUTTING PARAMETERS USING CCD METHOD IN RSM AND GENETIC ALGORITHM FOR AISI 4140 STEEL ALLOY
Author	Dr.B,Govinda Rajulu
Journal	International Journal of Vehicle Structures and Systems
Abstract	AISI 4140 steel alloys has repetitive applications in modern industry to cater the need of the society. AISI 4140 steel has applications in manufacturing of nuts, bolts, gears and static load bearing shafts etc. In this work, surface roughness (SR) of the machined AISI 4140 is evaluated after varying the feed in the range of 0.15 to 0.45 mm/revolution, tool rotational speed in range of 700 to 1300 rpm and depth of cut in the range of 2 to 6 mm. 20 experiments are suggested by RSM with face centred CCD design. With desirability 1, RSM predicts the optimal input parameters to minimize the SR complimented with a regression analysis. Further the developed model is solved in GA to get the optimum input parametric setting for achieving the better SR. A confirmation experiment is conducted in real time and average value suggested by RSM and RSM-GA of SR is compared and found that low percentage of error occured in later case.

Title	FEASIBILITY STUDY OF NOVEL BENGAL GRAM HUSK ASH AS A SUPPLEMENTARY CEMENTITIOUS MATERIAL: MECHANICAL, DURABILTY AND MICROSTRUCTURAL ASSESSMENTS
Author	V. S. Vani, Krupasindhu Biswal and G. Prasanna Kumar
Journal	Multiscale and Multidisciplinary Modeling, Experiments and Design
Abstract	The research in countries like India demands the agricultural based wastes to be used as supplementary cementitious materials (SCM). Wastes like rice husks, sugarcane bagasse is released in huge quantity which are converted into ash and successfully applied as SCMs. This paper aims to identify a novel agricultural waste which would enhance the property of cement concrete thereby enhancing the sustainability as well. As per the literatures, agro-products like corn straw ash and peanut shell ash were also adopted in concrete which proved to improve the mechanical and durability properties. An innovative recent literature proved that, green gram pod ash in small dosage (8%) enhances the concrete properties. In this research, another popular agricultural product viz., Bengal Gram Husk Ash (BGHA) is experimented as SCM in cement mortar, which was not attempted so far in literatures. BGHA was prepared by burning the waste Bengal gram husks in open burning method and sieved. The dosage of BGHA beyond 10% resulted in poor workability thus it was limited to 10% within which 2% increments were considered for mechanical, durability and microstructural assessments. Results revealed that 8% replacement of BGHA enhances the 28-days compressive strength upto 45% compared to reference mix. 10% BGHA mix showed reduction in compressive strength compared to 8% dosage, but however it improved the compressive strength of control mix by 40%. According to SEM analysis, BGHA has the capability to densify the matrix microstructure by occupying the pores/flaws in the cement matrix thereby enhances the property of concrete. Inclusion of BGHA showed three times more efficiency in arresting the external chemical influences like chloride, sulphate, seawater and capillary water rise. The developed mortar mix is more significant as they are eco-friendly, sustainable and technically beneficial. BGHA imposed mortar can be applied for special practical situations like tunnels, bridges and marine structures because of better durability and mechanical properties.

Title	ARTIFICIAL NEURAL NETWORKS FOR PREDICTING MECHANICAL PROPERTIES OF REINFORCED CONCRETE: A COMPARATIVE STUDY WITH EXPERIMENTAL DATA
Author	M. Sai Babu
Journal	Library of Progress-Library Science, Information Technology & Computer
Abstract	This study explores the use of Artificial Neural Networks (ANNs) for predicting key mechanical properties of reinforced concrete, including compressive, tensile, and flexural strength, based on mix parameters such as water-cement ratio, aggregate content, cement type, and curing time. Traditional testing methods are time-intensive and costly, underscoring the need for predictive models that offer rapid, accurate insights into concrete performance. Here, an ANN model was developed and trained using experimental data, achieving strong correlation with physical testing results and capturing the nonlinear interactions between input parameters. Sensitivity analysis identified the water-cement ratio, cement content, and aggregate proportions as critical factors influencing strength, with the ANN demonstrating high sensitivity to these variables. Comparisons with traditional methods highlight the ANN model's advantages in speed, cost-efficiency, and predictive accuracy, making it a practical tool for construction quality control. This study suggests that ANN models can be integrated into the construction workflow for quick, data-driven decision-making in mix design adjustments. Future work could expand the model's applicability by incorporating a wider range of concrete types and exploring hybrid machine learning approaches to further enhance accuracy and generalizability in diverse construction applications.

Title	EFFECT OF FIBERS ON STRENGTH CHARACTERISTICS OF CONCRETE
Author	G. Prasanna Kumar, Krupasindhu Biswal, and G. Anil Kumar
Journal	International Journal of Advances in Agricultural Science and Technology
Abstract	Concrete is the mostly consumed material in the field of construction across the world. It can be easily moulded into any shape by the mixture of different materials such as cement, water, fine and coarse aggregate. In general, concrete can withstand against compression than tension. Hence to improve the tensile characteristics of concrete, different types of fibers can be incorporated to overcome strength and durability properties. Usually, fibers used in concrete are natural and artificial fibers. Among them synthetic and steel fibers are used in the present study. These two types of fibers are added in percentages of 0.5%, 1% and 1.5 % respectively by cement weight. The experimental investigation is carried out to utilize the synthetic and steel fibers in M25 grade concrete for the development of strength characteristics in terms of compression and are compared by performing destructive and non-destructive tests at curing and non-curing conditions. The optimum percentages of fibers content is determined and comparison is made between the results obtained. The results obtained are found to be satisfying the requirements.

Title	DEVELOPMENT OF LIGHTWEIGHT HIGH-STRENGTH ENGINEERED GEOPOLYMER COMPOSITES USING SLAG WASTE AND VERMICULITE POWDER: MECHANICAL, DURABILITY AND MICROSTRUCTURAL ASSESSMENTS.
Author	G. Prasanna Kumar
Journal	Emergent Materials
Abstract	A material that holds the hybrid advantage of strain-hardening technical benefit and 100% eco-friendliness is popularly called as Engineered Geopolymer Composites (EGC). The recent trend in EGC studies is the development of special feature in EGC, among which the development of lightweight EGC grabbed recent attention. This paper attempts to apply the expanded vermiculite as the lightweight in assistance with river sand in high-strength EGC. The combination of GGBS and silica fume is considered as high-strength precursors. A 2% constant volume fraction of PolyVinyl Alcohol (PVA) fiber is adopted for Engineered Cementitious Composites (ECC) mechanism. The dosage of vermiculite was varied by 10% increment as a replacement to river sand upon mechanical, durability and microstructural assessments. Above 30% replacement resulted in poor strength. Increase in vermiculite content reduces the density, and increases the workability and durability characteristics. The density of 1771 kg/m3 is achieved with 30% vermiculite mix. 10% vermiculite has improved the compressive strength compared to the control mix up to 3.5% and recorded the maximum strength of 72.26 MPa. 20% and 30% vermiculite mixes showed a marginal decrement in strength than the control mix. Tensile-strain capacity of 5.076% is recorded by 30% vermiculite mix which is similarly efficient to flyash EGCs. Change in vermiculite did not show significant variation upon the tensile and flexural characteristics of the composite. 30% vermiculite has improved the durability upon chemical attack by 40%. Vermiculite occupies the pores of the river sand, makes the microstructure denser which leads to the improvement in the overall properties of the composite.

Title	FEASIBILITY STUDY OF NOVEL BENGAL GRAM HUSK ASH AS A SUPPLEMENTARY CEMENTITIOUS MATERIAL: MECHANICAL, DURABILTY AND MICROSTRUCTURAL ASSESSMENTS
Author	G. Prasanna Kumar, V. Sowjanya Vani and Krupasindhu Biswal
Journal	Multiscale and Multidisciplinary Modeling, Experiments and Design
Abstract	The research in countries like India demands the agricultural based wastes to be used as supplementary cementitious materials (SCM). Wastes like rice husks, sugarcane bagasse is released in huge quantity which are converted into ash and successfully applied as SCMs. This paper aims to identify a novel agricultural waste which would enhance the property of cement concrete thereby enhancing the sustainability as well. As per the literatures, agro-products like corn straw ash and peanut shell ash were also adopted in concrete which proved to improve the mechanical and durability properties. An innovative recent literature proved that, green gram pod ash in small dosage (8%) enhances the concrete properties. In this research, another popular agricultural product viz., Bengal Gram Husk Ash (BGHA) is experimented as SCM in cement mortar, which was not attempted so far in literatures. BGHA was prepared by burning the waste bengal gram husks in open burning method and sieved. The dosage of BGHA beyond 10% resulted in poor workability thus it was limited to 10% within which 2% increments were considered for mechanical, durability and microstructural assessments. Results revealed that 8% replacement of BGHA enhances the 28-days compressive strength upto 45% compared to reference mix. 10% BGHA mix showed reduction in compressive strength compared to 8% dosage, but however it improved the compressive strength of control mix by 40%. According to SEM analysis, BGHA has the capability to densify the matrix microstructure by occupying the pores/flaws in the cement matrix thereby enhances the property of concrete. Inclusion of BGHA showed three times more efficiency in arresting the external chemical influences like chloride, sulphate, seawater and capillary water rise. The developed mortar mix is more significant as they are eco-friendly, sustainable and technically beneficial. BGHA imposed mortar can be applied for special practical situations like tunnels, bridges and marine structures because of better durability and mechanical properties.

Title	UNVEILING GROUNDWATER GEMS: A GIS-POWERED FUSION OF AHP AND TOPSIS FOR MAPPING GROUNDWATER POTENTIAL ZONES
Author	Sanjay Kumar Ray
Journal	Groundwater for Sustainable Development
Abstract	Groundwater is indispensable to various sectors like industry, households, and agriculture, yet its assessment remains critical. This research focuses on evaluating potential groundwater zones within the Jamsholaghat watershed, employing a robust geospatial approach. Twelve thematic maps, spanning factors influencing groundwater recharge, namely lithology, drainage density, distance from river, land use and land cover, lineament density, rainfall, hydrological soil group, roughness, geomorphology, topographic position index, slope, and topographic wetness index underwent a multicollinearity check for independence before integration using ArcGIS's weighted overlay analysis. Utilizing a combination of the Technique for Order Preference by Similarity to the Ideal Solution (TOPSIS) and the Analytical Hierarchy Process (AHP), each thematic map was ranked based on its relative significance in groundwater recharge. The resulting Groundwater Potential Zone (GPZ) map divided the region into high (40%), medium (52%), and low (8%) potential zones. Notably, the easternmost part emerged as the most conducive for recharge, attributed to factors like favorable lithology (laterite and quartz), geomorphological features (water bodies and flood plains), high rainfall, and gentle slope. This insight can inform targeted interventions for sustainable groundwater management. This practical information empowers water resource managers to prioritize exploration efforts. By focusing drilling activities on high-potential zones, success rates can increase, saving time, money, and minimizing environmental impact. Furthermore, understanding recharge-influencing factors can guide land-use practices that promote infiltration, ensuring the long-term sustainability of this vital resource. This research paves the way for informed decision-making, fostering sustainable groundwater management practices within the Jamsholaghat watershed.

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Institute of Technology and Management
(An Autonomous Institution)

Tekkali-532 201, Srikakulam Dist., AP
Tel: 0845-245666, 245266, 92466 57908
Email: info@adityatekkali.edu.in