SRI KRISHNA INSTITUTIONS COIMBATORE

SUSTAINABLE DEVELOPMENT GOALS

SKCT supports the Sustainable Development Goals

Sri Krishna College of Technology
An Autonomous Institution
Affiliated to Anna University and Approved by AICTE
Accredited by NAAC with 'A' Grade
KOVAIPUDUR CAMPUS, COIMBATORE - 641 042.

VOL 24 - ISSUE 22
10 NOV - 17 NOV 2024

SKCT DIGEST

THE PRIDE OF OUR REFLECTION

ISBN NUMBER
978-93-5895-815-7

"Successful people begin where failures leave off. Never settle for 'just getting the job done.' Excel!"
- Tom Hopkins

Contact Us
0422-2984567 - 68
Kovaipudur,
Coimbatore - 641 042.

CII-EDU-TECH EXPO 2024

The Secretary of the Higher Education Department, **Mr K Gopal** presented the first copy of the joint CII-KPMG report on **"Emerging Trends in Higher Education"** to **Smt S Malarvizhi**, the Chairperson and Managing Trustee, Sri Krishna Institutions during the inaugural session of CII-Edu-Tech Expo 2024.

Tamil Nadu Leads in Higher Education with CM's Research Grant and Industry-Ready Focus at CII Edu-Tech Expo 2024

At CII Edu-Tech Expo 2024 in Coimbatore, Tamil Nadu's Additional Chief Secretary highlighted the state's initiatives in higher education, including the CM's Research Grant and focus on industry-ready graduates, reflecting the state's commitment to educational excellence.

THE HINDU
www.thehindu.com
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Research Parks planned in State universities to bridge industry-academia gap

T.N. is in the forefront of higher education with 50% gross enrolment ratio; real-world projects can be undertaken through the research park, says K. Gopal, Secretary of Higher Education Dept.

The Hindu Bureau
COIMBATORE

Expressing the commitment of the State Government to implement outcome-based learning, Secretary of Higher Education Department K. Gopal informed in Coimbatore on Friday that research parks would be established in State universities to foster academia-industry collaboration.

Real-world projects could be undertaken through the research parks, Mr. Gopal said, while highlighting the integration of technology into education to equip students for industry requirements, and tracking of their progress.

Addressing the inaugural session of the maiden CII Edu-Tech Expo 2024 of the Confederation of Indian Industry Southern Region, and the eighth edition of its National Higher Education Conclave, the Higher Education Secretary said Tamil Nadu was in the forefront of higher education with 50 % Gross Enrolment Ratio.

Tamil Nadu, he said, has partnered with technology leaders to impart expertise in Industry 4.0, Artificial Intelligence, Robotics, Cloud Computing and Soft Skills, to develop digitally-empowered workforce, Mr. Gopal said.

Secretary of Higher Education Department K. Gopal hands over first copy of the joint report by CII-KPMG on Emerging Trends in Higher Education to S. Malarvizhi, Chairperson and Managing Trustee, Sri Krishna Institutions, during the inaugural session of CII Edu-Tech Expo 2024 in the city on Friday. M. PERIASAMY

Rajesh Varrier, Executive Vice-President, Global Head of Operations, and Chairman and Managing Director, Cognizant India, emphasised on bridging the industry-academia gap by involving industry experts in framing curricula, train the trainers programme for faculty, and internship programmes for students. The industry looks for skills than degrees. Institutions could consider opening up opportunities for life-long learning for alumni, Mr. Rajesh suggested.

The Higher Education Secretary handed over the first copy of the joint report by CII-KPMG on Emerging Trends in Higher Education to S. Malarvizhi, Chairperson and Managing Trustee, Sri Krishna Institutions.

Providing insights into the report earlier, Narayanan Ramasamy, Partner, KPMG, explained how Artificial Intelligence has brought about a change in the education landscape through personalised approach and breaking language barriers.

The report underscores the utility of Immersive Learning Experience, Augmented Reality, Virtual Reality, Block Chain Network, and Gamification in bridging the industry-academia gap, Mr. Narayanan said.

R. Nandhini, Chairperson, CII Edu-Tech Expo 2024, CII Southern Region and Founder Trustee, GRG Trust; Shankar Vanavarayar, Past Chairman, CII Tamil Nadu and President, Kumaraguru Institutions; and K. Senthil Ganesh, Immediate Past Chairman, CII Coimbatore Zone and Managing Trustee, RVS Group of Institutions, also addressed the inaugural session, which was followed by four technical sessions on future of higher education, emerging trends, nurturing industry-readiness, and commercialisation of intellectual properties.

INSTITUTION OF HAPPINESS BY QS I - GAUGE 2024-2025

🌟 ! Spreading Smiles, Shaping Futures ! 🌟
Sri Krishna College of Technology is proud to be recognized as an *Institution of Happiness* by QS I-GAUGE for 2024-2025.

SRI KRISHNA INSTITUTIONS COIMBATORE

SRI KRISHNA COLLEGE OF TECHNOLOGY

is recognised as

IOH
Institution Of Happiness

by

QS I-GAUGE

for the year 2024-2025

Moment to rejoice!

"Our Sincere Thanks to all Stakeholders"

14.11.2024 | Bengaluru

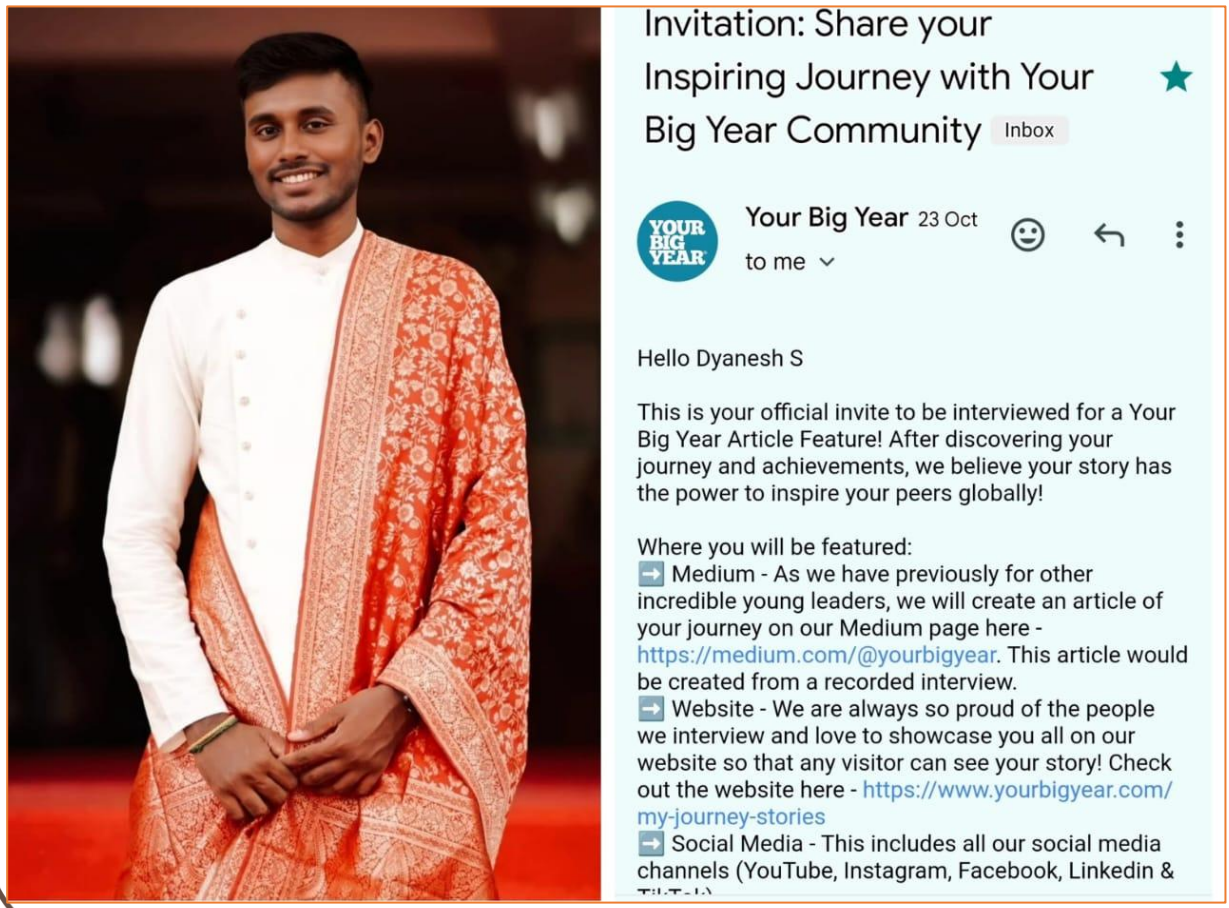
NPTEL OCTOBER 2024 RESULTS

Status	Count
Successfully Completed	16
Elite	26
Elite + Silver	8
Topper	2

Category	Details
Total No. of Learners Registered	1,679
No. of Students Placed in the Block List	5
No. of Absentees	185
Total No. of Learners Appeared (September)	1,489
Total No. of Courses Appeared	64
No. of Courses with Results Published	10
No. of Courses with Results Pending	54
No. of Learners with Published Results	65
No. of Learners Who Failed	15
No. of Learners Who Completed Courses	50

INDIA'S YOUNG POTENTIAL LEADER

Mr Dyanesh S, Student of Final B.E. EEE, has been honored as the "**India's Young Potential Leader"** by International Connector, USA and the Hague. His exceptional journey, vision and leadership qualities have earned him a place in the global spotlight. Mr Dyanesh's inspiring story on **Make it Sustainable**, has been featured in **Your Big Year article on Medium**, highlighting his commitment to meaningful and sustainable change. He has been selected as the representative of India and a distinguished leader by the International Connector organization.



Invitation: Share your Inspiring Journey with Your Big Year Community Inbox

Your Big Year 23 Oct
to me

Hello Dyanesh S

This is your official invite to be interviewed for a Your Big Year Article Feature! After discovering your journey and achievements, we believe your story has the power to inspire your peers globally!

Where you will be featured:
➡ Medium - As we have previously for other incredible young leaders, we will create an article of your journey on our Medium page here - https://medium.com/@yourbigyear. This article would be created from a recorded interview.
➡ Website - We are always so proud of the people we interview and love to showcase you all on our website so that any visitor can see your story! Check out the website here - https://www.yourbigyear.com/my-journey-stories
➡ Social Media - This includes all our social media channels (YouTube, Instagram, Facebook, Linkedin &

SKCT – TRAFFIC REGULATION AWARD

Sri Krishna College of Technology received a Certificate of Appreciation for **"Diwali Traffic Regulation"** from Coimbatore City Police in collaboration with the Uyir Club. **Mr K Mohan**, Asst. Professor and Coordinator of Uyir Club, along with the Student Team have been recognized for their outstanding contribution.

NATIONAL HIGHER EDUCATION CONCLAVE 2024

Faculty Participation

Dr Jeen Robert R B, Dr J Jency Joseph, Dr S Dilip Kumar and **Dr V Sathish Kumar,** the Members of Faculty, participated in the **"National Higher Education Conclave 2024 – 8th Edition"** organised at the CODISSIA Complex, Coimbatore on 15 November 2024.

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

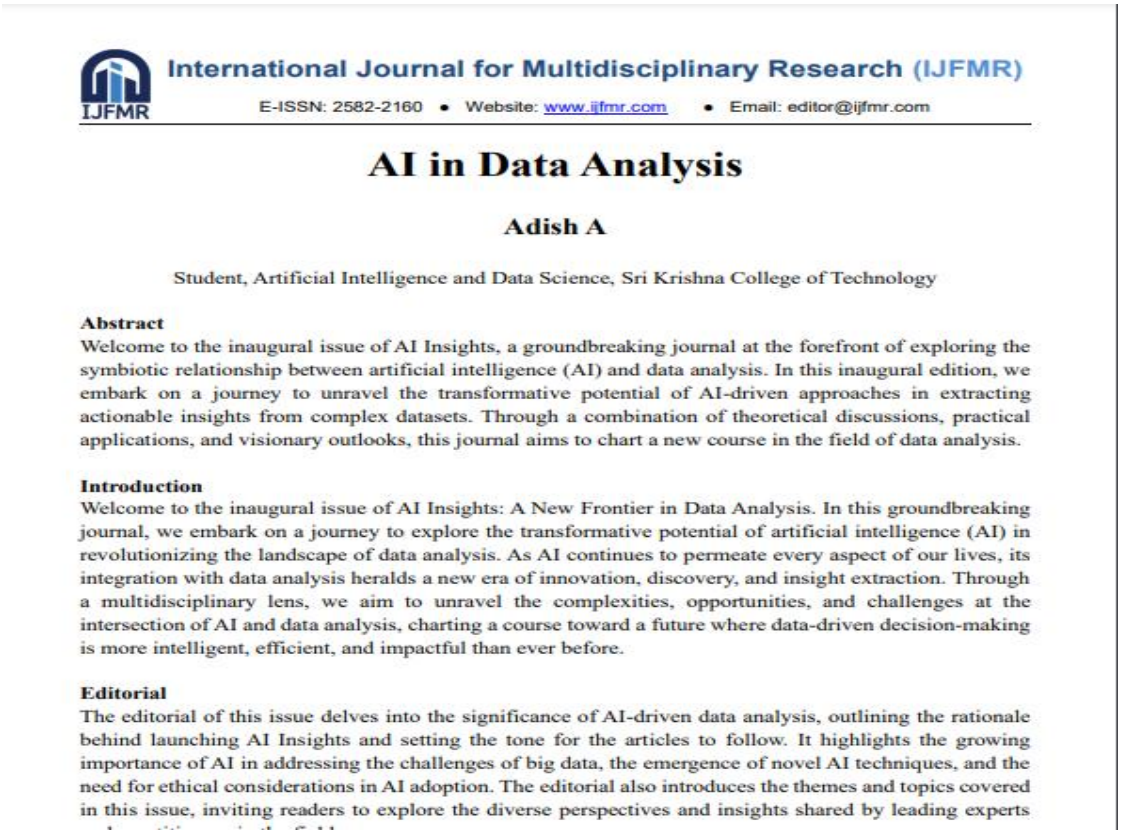
Students' Participation

Mr Deepak R and **Mr Ragunath**, Students of Third B.Tech. ADS, participated in a Three-day workshop on "**Mastering the Art of React and Redux.**"

ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Student Participation

Mr Adish A, Student of Third B.Tech. ADS, published a journal paper on "**AI in Data Analysis"** in the International Journal for Multidisciplinary Research.



International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

AI in Data Analysis

Adish A

Student, Artificial Intelligence and Data Science, Sri Krishna College of Technology

Abstract
Welcome to the inaugural issue of AI Insights, a groundbreaking journal at the forefront of exploring the symbiotic relationship between artificial intelligence (AI) and data analysis. In this inaugural edition, we embark on a journey to unravel the transformative potential of AI-driven approaches in extracting actionable insights from complex datasets. Through a combination of theoretical discussions, practical applications, and visionary outlooks, this journal aims to chart a new course in the field of data analysis.

Introduction
Welcome to the inaugural issue of AI Insights: A New Frontier in Data Analysis. In this groundbreaking journal, we embark on a journey to explore the transformative potential of artificial intelligence (AI) in revolutionizing the landscape of data analysis. As AI continues to permeate every aspect of our lives, its integration with data analysis heralds a new era of innovation, discovery, and insight extraction. Through a multidisciplinary lens, we aim to unravel the complexities, opportunities, and challenges at the intersection of AI and data analysis, charting a course toward a future where data-driven decision-making is more intelligent, efficient, and impactful than ever before.

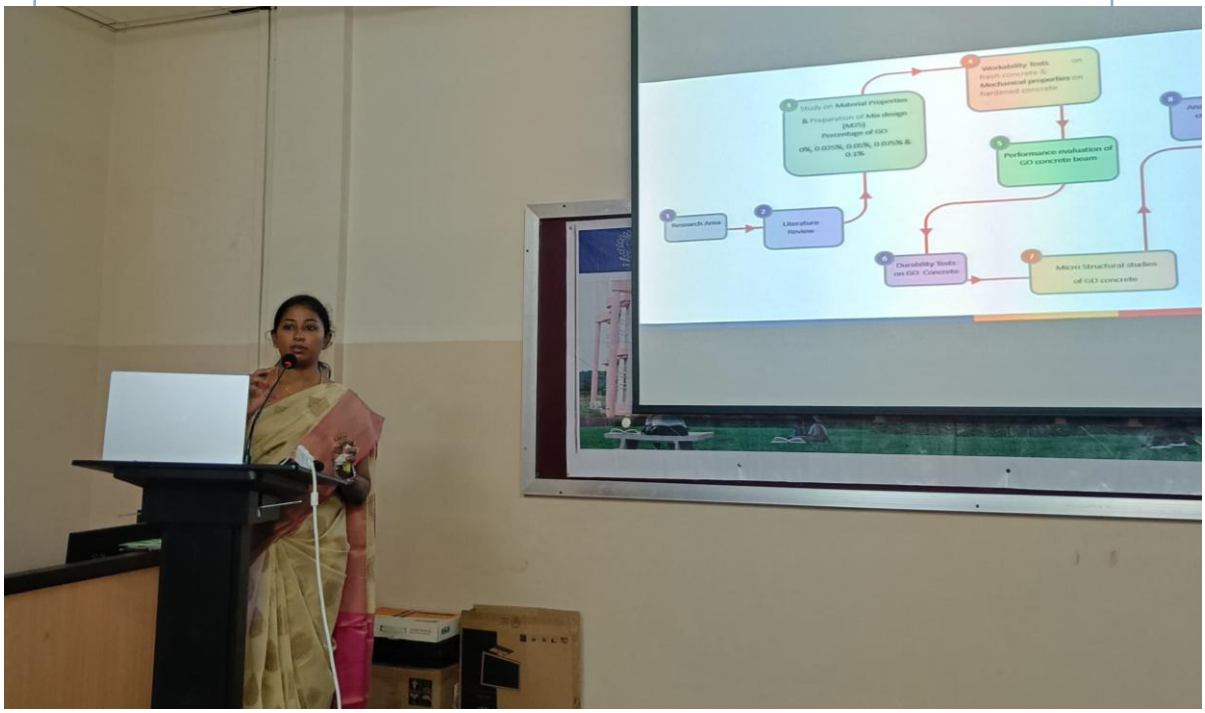
Editorial
The editorial of this issue delves into the significance of AI-driven data analysis, outlining the rationale behind launching AI Insights and setting the tone for the articles to follow. It highlights the growing importance of AI in addressing the challenges of big data, the emergence of novel AI techniques, and the need for ethical considerations in AI adoption. The editorial also introduces the themes and topics covered in this issue, inviting readers to explore the diverse perspectives and insights shared by leading experts

CIVIL ENGINEERING

Faculty Achievement

Ms G Selina Ruby, Asst. Professor, defended her thesis on **"Effect of Graphene Oxide on the Performance of Concrete."**

Dr G Selina Ruby



CIVIL ENGINEERING

Faculty Achievement

Dr V Sreevidya, Professor and Head, published an article on "**Drought Vulnerability Assessment Using GIS and Remote Sensing Technique: A Case Study in Part of Coimbatore, Tamil Nadu, India"** in the Journal of the Indian Society of Remote Sensing (Q2, SCI Journal), published by Springer.

Dr V Sreevidya

updates

Drought Vulnerability Assessment Using GIS and Remote Sensing Techniques: A Case Study in Part of Coimbatore, Tamil Nadu, India

S. Krishnakumar[1] · V. Sreevidhya[2] · S. Vivek[3] · V. Priya[3]

Received: 18 April 2023 / Accepted: 16 October 2024

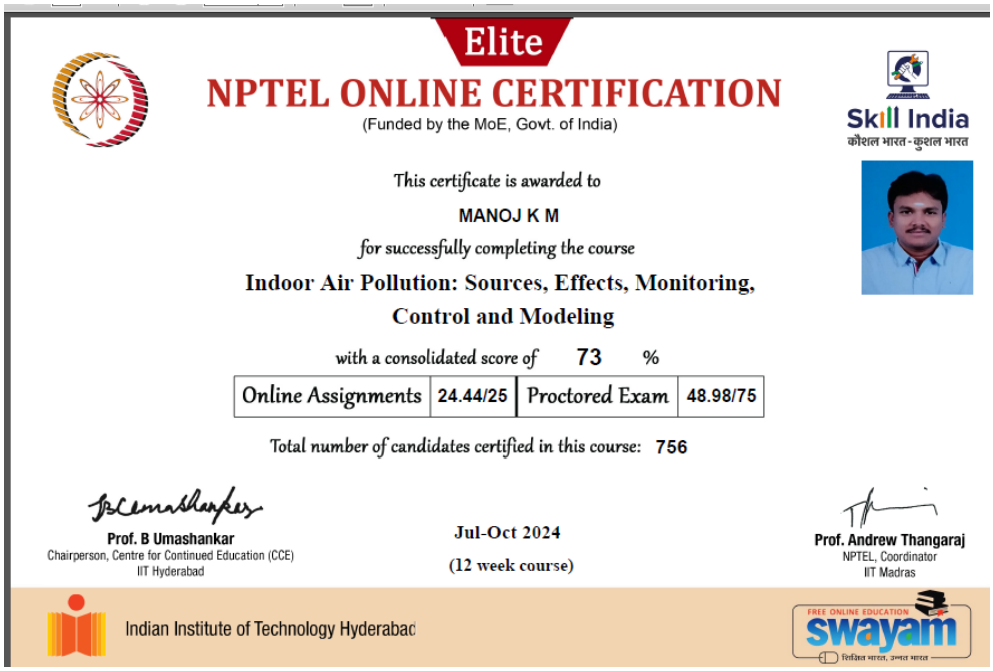
Abstract

This study used integrated GIS and remote sensing data to forecast the spatiotemporal drought risk regions facing agriculture and meteorology in part of Coimbatore. The Coimbatore region's drought evaluation was divided into two categories: agricultural drought and meteorological drought. Normalized Difference Vegetation Index (NDVI) and Vegetation Condition Index (VCI) were used to measure drought in agriculture. Due to yearly rainfall patterns and the standard precipitation index (SPI), resultant meteorological drought assessment. In addition to the standardized precipitation indicator, which is based on meteorology and is used as a meteorological drought index, For Agriculture drought risk has been assessed using Landsat 8 OLI/TIRS and 7 ETM + temporal images based on Normalized Difference Vegetation Index and Vegetation Condition Index for the years 2000 and 2020. Finally, utilizing NDVI, VCI, seasonal rainfall, and SPI values together with a weighted overlay approach, maps of the spatial–temporal drought risk were created. Land use and land cover changes were also carried out in this study. Comparing the drought changes depending on the patterns of land use and cover between 2000 and 2020. The comparison findings show that terrain modification rapidly, which leads to drought in that region, develops when land is being developed like built-up areas, Industries and other human made activities by deformation of Crop Land, Plantation, Water body, and Forest. As a result, the drought risk can be precisely calculated by integrating a number of parameters shows where the areas are most severely impacted by the drought in 2000 were Sultanpet, Singanallur, Thalakkarai, Sethumadai, Kariyambalayam, Koolarpatti, and Kuniyamuthur. Some regions like Karumathampatti, Sulur, Singanallur, Sultanpet, Kuniyamuthur, Kinathukadavu, Periya Negamam, Pollachi, Anaimalai, Kottur, and Aliyar are affected by drought in the year of 2020. Overall, the Coimbatore region's land use and land cover patterns have changed, which has increased the region's vulnerability to drought from 2000 to 2020.

CIVIL ENGINEERING

Faculty Certification

Mr Manoj K M, Asst. Professor, has been awarded with the **ELITE Certification** for the course on **"Indoor Air Pollutants: Sources, Effects, Monitoring, Control, and Modelling"** offered by IIT Hyderabad.



Elite

NPTEL ONLINE CERTIFICATION

(Funded by the MoE, Govt. of India)

Skill India
कौशल भारत-कुशल भारत

This certificate is awarded to

MANOJ K M

for successfully completing the course

Indoor Air Pollution: Sources, Effects, Monitoring, Control and Modeling

with a consolidated score of 73 %

Online Assignments	24.44/25	Proctored Exam	48.98/75

Total number of candidates certified in this course: 756

Prof. B Umashankar
Chairperson, Centre for Continued Education (CCE)
IIT Hyderabad

Jul-Oct 2024
(12 week course)

Prof. Andrew Thangaraj
NPTEL, Coordinator
IIT Madras

Indian Institute of Technology Hyderabad

FREE ONLINE EDUCATION swayam

CIVIL ENGINEERING

Student Achievement

Mr Mugesh S, Student of Final B.E. Civil Engineering, has been selected for the position of **"Engineering Management Services Trainee (EMS)"** at SPIC/Greenstar, Tuticorin.

Mr Mugesh S

CIVIL ENGINEERING

Students' Achievement

Mr Gokul Raj R and **Mr Karthikeyan K,** Students of Final B.E. Civil Engineering, has been selected for an Internship in Wet Shield Waterproofing Solution, Bangalore with a stipend of Rs. 1.8 LPA.

wet shield
WATERPROOFING EXPERT
+91 80155 45547, +91 96292 04330
info@wetshield.in

Date: 09-Nov-2024

Gokul Raj R.
699, Jamadharmedu, Kaveripattinam,
Krishnagiri, Tamilnadu - 635112

Re: Internship offer letter

Dear Gokul Raj R,

We are thrilled to offer you an internship at Wet shield. We were highly impressed with your skills and academic achievements during the selection process, and we are excited to welcome you to our team.
Your internship will commence on 01/12/2024 and will conclude on 28/02/2025.

You will be directly reporting to Saburinathan, who will provide guidance and support throughout your internship.

Internship Details:
As an intern, you will actively participate in a variety of projects and tasks that are essential to our operations. This internship is structured to provide you with hands-on experience and support your development of skills critical to the engineering field. Your primary responsibilities will include but are not limited to collaborating with team members to achieve project objectives, conducting research and analysis as required, participating in team meetings and contributing insights and ideas.

Compensation & Benefits
We are pleased to offer you a INR 15,000 internship stipend per month.

Acceptance
To accept this offer, please sign and return this letter by 13/11/2024. We look forward to welcoming you to Wet shield.

Thank you.
Regards,
Sreelakshmi V
HR
Wet shield.

www.wetshield.com
204-JH, Ashirvad colony, Hormavu, Bangalore - 560043

wet shield
WATERPROOFING EXPERT
+91 80155 45547, +91 96292 04330
info@wetshield.in

Date: 09-Nov-2024

Karthikeyan K
4/209, middle street, Kovilpalayam, Thungapuram,
Kunnam, Perambalur - 621 716

Re: Internship offer letter

Dear Karthikeyan K,

We are thrilled to offer you an internship at Wet shield. We were highly impressed with your skills and academic achievements during the selection process, and we are excited to welcome you to our team.
Your internship will commence on 01/12/2024 and will conclude on 28/02/2025.

You will be directly reporting to Saburinathan, who will provide guidance and support throughout your internship.

Internship Details:
As an intern, you will actively participate in a variety of projects and tasks that are essential to our operations. This internship is structured to provide you with hands-on experience and support your development of skills critical to the engineering field. Your primary responsibilities will include but are not limited to collaborating with team members to achieve project objectives, conducting research and analysis as required, participating in team meetings and contributing insights and ideas.

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Acceptance
To accept this offer, please sign and return this letter by 13/11/2024. We look forward to welcoming you to Wet shield.

Thank you.
Regards,
Sreelakshmi V
HR
Wet shield.

www.wetshield.com
204-JH, Ashirvad colony, Hormavu, Bangalore - 560043

ELECTRONICS AND COMMUNICATION ENGINEERING

Placement

Ms K S Subhashini and **Ms S Aishwarya,** Students of Final B.E. ECE, received the placement offer from **"Cognizant."**

SUBHASHINI K S
727821TUEC232
Batch 2021-25/ECE

AISHWARYA S
727821TUEC008
Batch 2021-25/ECE

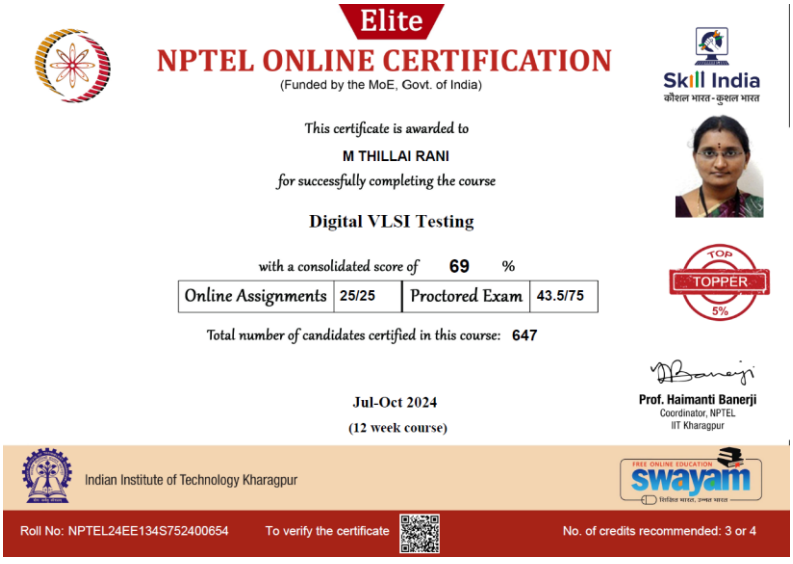
for getting placement offer with

cognizant

ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Online Certification

Dr M Thillai Rani, Assoc. Professor, completed a 12-week course on **"Digital VLSI Testing with Elite Certification (Top 5% Topper)"** offered through NPTEL.



Elite

NPTEL ONLINE CERTIFICATION

(Funded by the MoE, Govt. of India)

Skill India
कौशल भारत - कुशल भारत

This certificate is awarded to

M THILLAI RANI

for successfully completing the course

Digital VLSI Testing

with a consolidated score of 69 %

Online Assignments	25/25	Proctored Exam	43.5/75

Total number of candidates certified in this course: 647

TOP TOPPER 5%

Jul-Oct 2024

(12 week course)

Prof. Haimanti Banerji
Coordinator, NPTEL
IIT Kharagpur

Indian Institute of Technology Kharagpur

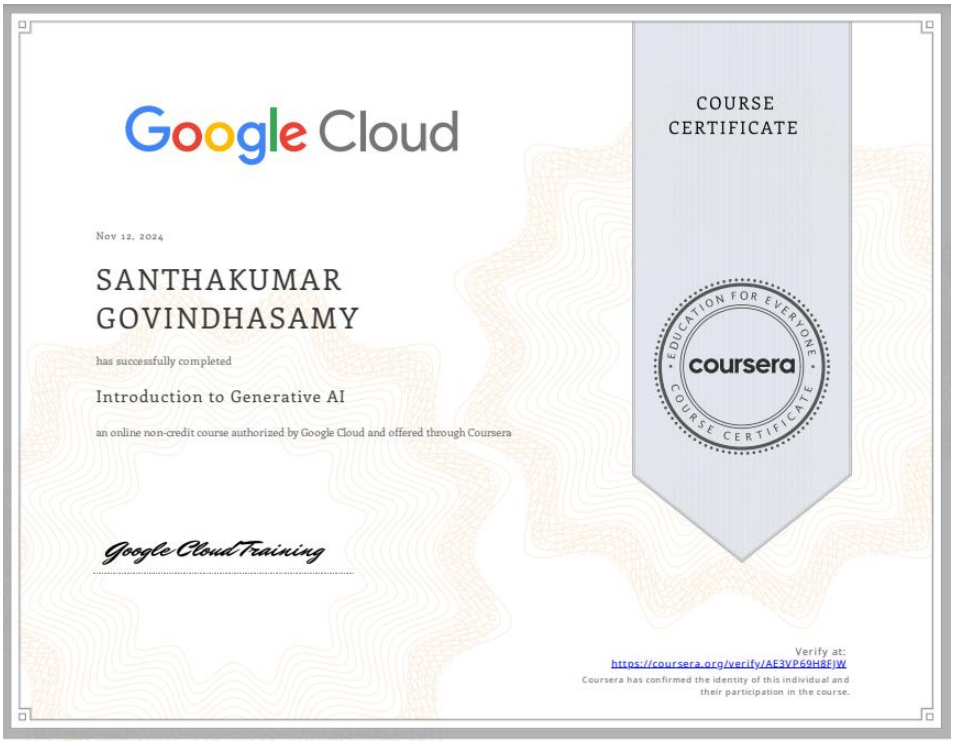
swayam

Roll No: NPTEL24EE134S752400654 To verify the certificate No. of credits recommended: 3 or 4

ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Online Certification

Mr G Santhakumar, Asst. Professor, completed a 4-week course on **"Introduction to Generative AI"** offered through Coursera.



ELECTRONICS AND COMMUNICATION ENGINEERING

Guest Lecture

Mr V Suresh Babu, Asst. Professor, delivered a guest lecture on **"Signals and Systems"** for the Students of ECE, United Institute of Technology, Coimbatore on 08 November 2024.

ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Publication

Dr P Divya, Asst. Professor, published a research article on **"Hybrid Machine Learning Approach for Early Stroke Prediction in Elderly People"** in the journal of Communication on Applied Nonlinear Analysis, Vol. 32, Issue 2, 2024.

1 of 9 pplied Nonlinear Analysis

Vol 32 No. 2s (2025)

Hybrid Machine Learning Approach for Early Stroke Prediction in Elderly People

Dr.P.Divya[1], Dr.K.Lakshmi Prabha[2], Dr.B.Aruna Devi[3], V.Vinoth Kumar[4], K.Balaji[5], Dr. C.Ezhilazhagan[6], Dr.R.Senthil Ganesh[7]

[1]Assistant Professor, ECE, Sri Krishna College of Technology, Coimbatore, Email: p.divya@skct.edu.in
[2]Head & Associate professor, Department of ECE (ACS), Chennai institute of technology, Kundrathur, Email:lakshmisslp@gmail.com
[3]Professor, Department of ECE, Dr NGP Institute of Technology, Coimbatore, Email:arunadevi@drngpit.ac.in
[4]Assistant Professor, Department of ECE, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, Email:icevinoth@gmail.com
[5]Assistant professor, Department of AI&DS, Sri Krishna College of Engineering and Technology, Coimbatore balajisparklers@gmail.com
[6]Assistant Professor, Department of ECE, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, Email:ezhisang20@gmail.com
[7]Associate Professor, Department of ECE, Sri Krishna College of Engineering and Technology, Coimbatore drsenthilganesh@gmail.com

Article History:
Received: *11-09-2024*
Revised: *19-10-2024*
Accepted: *28-10-2024*

Abstract:

Stroke represents a significant global health challenge, often leading to severe disability and mortality. The timely prediction and intervention of stroke are paramount in enhancing patient outcomes and reducing healthcare burdens. This project proposes a machine learning-based approach to predict stroke risk using multi-modal biosignals, specifically electrocardiogram (ECG) data. By leveraging advanced algorithms, including Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks, the system aims to classify patient health data into critical risk categories such as Normal, Abnormal, Ischemic, and Hemorrhagic. The study utilizes a comprehensive dataset consisting of ECG signals and incorporates techniques for data preprocessing, class balancing, and feature extraction. The predictive model is trained and validated using robust evaluation metrics, including accuracy, precision, recall, and F1-score. The findings underscore the efficacy of the proposed system in providing real-time stroke risk assessments, offering a cost-effective alternative to traditional diagnostic methods. Furthermore, this research explores the integration of wearable technology with machine learning, highlighting its potential for continuous patient monitoring and early detection of stroke symptoms. By creating a user-friendly interface for healthcare professionals and patients, the system aims to facilitate prompt decision-making and intervention, ultimately improving the overall quality of care for individuals at risk of stroke

Keywords: Stroke, electrocardiogram (ECG), Convolutional Neural Networks (CNNs), Convolutional Neural Networks (CNNs), diagnostic methods.

1. INTRODUCTION

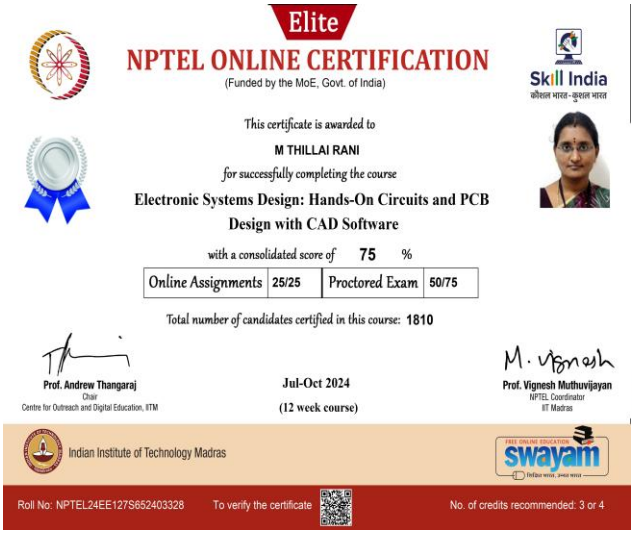
Stroke is a leading cause of death and long-term disability, making timely prediction and intervention crucial for improving patient outcomes. Advances in wearable technology and machine learning provide new opportunities for real-time health monitoring and predictive analytics. By leveraging these innovations, we can enhance the accuracy of stroke risk assessments and empower individuals to take proactive health measures. This project aims to develop a machine learning-based system for stroke prediction using ECG data from wearable devices, ultimately facilitating early detection and intervention [1]. The early prediction and intervention of stroke are essential for enhancing patient

https://internationalpubls.com 241

ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Online Certification

Dr M Thillai Rani, Assoc. Professor, completed a 12-week course on **"Electronic Systems Design: Hands-On Circuits and PCB with Elite + Silver Certification"** offered through NPTEL.


Elite

NPTEL ONLINE CERTIFICATION

(Funded by the MoE, Govt. of India)

Skill India

This certificate is awarded to

M THILLAI RANI

for successfully completing the course

Electronic Systems Design: Hands-On Circuits and PCB Design with CAD Software

with a consolidated score of 75 %

Online Assignments	25/25	Proctored Exam	50/75

Total number of candidates certified in this course: 1810

Prof. Andrew Thangaraj
Chair
Centre for Outreach and Digital Education, IITM

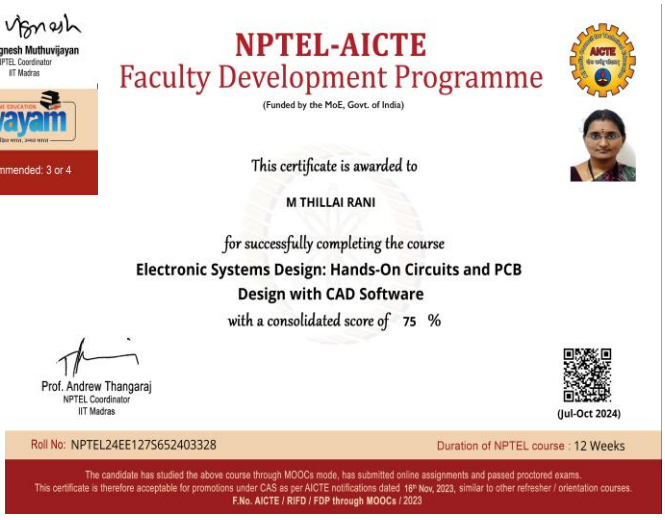
Jul-Oct 2024
(12 week course)

Prof. Vignesh Muthuvijayan
NPTEL Coordinator
IIT Madras

Indian Institute of Technology Madras

swayam

Roll No: NPTEL24EE127S652403328 To verify the certificate No. of credits recommended: 3 or 4


NPTEL-AICTE

Faculty Development Programme

(Funded by the MoE, Govt. of India)

AICTE

This certificate is awarded to

M THILLAI RANI

for successfully completing the course

Electronic Systems Design: Hands-On Circuits and PCB Design with CAD Software

with a consolidated score of 75 %

Prof. Andrew Thangaraj
NPTEL Coordinator
IIT Madras

(Jul-Oct 2024)

Roll No: NPTEL24EE127S652403328 Duration of NPTEL course : 12 Weeks

The candidate has studied the above course through MOOCs mode, has submitted online assignments and passed proctored exams.
This certificate is therefore acceptable for promotions under CAS as per AICTE notifications dated 16th Nov, 2023, similar to other refresher / orientation courses.
F.No. AICTE / RIFD / FDP through MOOCs / 2023

ELECTRONICS AND COMMUNICATION ENGINEERING

Faculty Online Certification

Mr M Arunkumar, Asst. Professor, completed the courses on **"Cybersecurity (CC) : Core Security Principles and Risk Management"** and **"Certified in Cybersecurity (CC) : Incident Response"** offered through Infosys Springboard.

ELECTRICAL AND ELECTRONICS ENGINEERING

Faculty Publication

Dr Magdalin Mary, Asst. Professor, published a research article on **"A Modified 2:1 Multiplexer – based Ternary ALU for IoT Applications"** in the Journal of Engineering Science and Technology Review on 09 November 2024.

Jestr

Journal of Engineering Science and Technology Review 17 (5) (2024) 104-109

Research Article

JOURNAL OF Engineering Science and Technology Review

www.jestr.org

A Modified 2:1 Multiplexer-Based Low Power Ternary ALU for IoT Applications

S. Allwin Devaraj[1,*], D. Magdalin Mary[2], P. Kannan[1], S. Esakki Rajavel[3], Cynthia Anbuselvi Thangaraj[4], K. B. Gurumoorthy[5] and Blanie Scrimshaw William[6]

[1]*Department of Electronics and Communication Engineering, Francis Xavier Engineering College, Tirunelveli-627003, Tamilnadu, India.*
[2]*Department of Electrical and Electronics Engineering, Sri Krishna College of Technology, Coimbatore-641042, Tamilnadu, India.*
[3]*Department of Electronics and Communication Engineering, Karpagam Academy of Higher Education, Coimbatore- 641021, Tamilnadu, India.*
[4]*Department of Electronics and Communication Engineering, SEA College of Engineering and Technology, Bengaluru-560049, Karnataka, India.*
[5]*Department of Electronics and Communication Engineering, KPR Institute of Engineering and Technology, Coimbatore-641407, Tamilnadu, India.*
[6]*Department of Computer Science and Engineering, Rohini College of Engineering and Technology, Kanyakumari-629401, Tamilnadu, India.*

Received 27 March 2024; Accepted 13 October 2024

Abstract

The ternary logic has a benefit over the binary logic which provides a secured solution to achieve a trade-off between the area and power of the design. However, from the structure of the ternary Aritmetic Logic Unit (ALU), it is clear that its architecture increases the area, propagation delay, and power consumption. To overcome this drawback, a loopback algorithm is proposed to achieve low power and high throughput Internet of Things (IoT) processors. The loopback algorithm reduces the number of processing stages in multipliers and adders which can significantly reduce area and power dissipation. The proposed 2:1 multiplexer-based approach reduces the need for a decoder and results in low power consumption. The proposed design will be implemented in Xilinx ISE 13.0 and simulation will be done in Modelsim. The modified Ternary ALU (TALU) performs finer than the previous TALU method. The number of registers used in this architecture is reduced by up to 25% than the existing system therefore there is a reduction in power dissipation.

Keywords: TALU, OR, EXOR, Multiplexer, Delay, Power Consumption.

1. Introduction

Digital signal processor plays a significant role in electronic devices, biomedical applications, communication protocols, LTE devices, etc [1-3]. Efficient IC design is a key factor to achieve low power and high throughput IP core development for portable and LPD [4]. Internet of Things plays a significant role in real-time computing and processing [5-7]. Now that every object can be connected to the internet. These devices range from ordinary household objects to industrial tools but area overhead and power consumption are major drawbacks to achieving efficient design constraints. In modern society, the most important

In an earlier paper, based on the pipelined technique the TALU designs are built. It makes the design more complex because of the usage of area and the processing stages. To overcome the drawbacks in the previous works the proposed design uses the loopback algorithm so that there will be a reduction in area and consumption of power and also reduces the interconnection and the computational costs [15-16]. The loopback technique stores the data in the memory and gives it as output when it is needed so there is a reduction in the processing stages than the previous method. It uses a 2:1 multiplexer-based technique so there will be a reduction in the decoder and to make the arithmetic circuit implement effectively [17-18].

ELECTRICAL AND ELECTRONICS ENGINEERING

Faculty Certification

Ms Jeevitha K, Dr Lijo Jacob Varghese and **Mr Harish R,** the Members of Faculty, completed online certification course on "**Fundamentals of AI and ML**" through Infosys Springboard.

ELECTRICAL AND ELECTRONICS ENGINEERING

Faculty Certification

Dr Jaisiva S, Dr Sophia Jasmine G, Mr Bharaniprakash T, Mr Harish R and **Dr Dilipkumar S**, the Members of Faculty, completed online certification course on "**Deep Learning with PyTorch : Generative Adversarial Network**" through Coursera.

ELECTRICAL AND ELECTRONICS ENGINEERING

Faculty Certification

Mr Harish R, Asst. Professor, completed online certification course on "**Tools of the Trade: Linux and SQL**" through Coursera.

ELECTRICAL AND ELECTRONICS ENGINEERING

Faculty Participation

Dr Jency Joseph J and **Dr Dilipkumar S**, the Members of Faculty, attended **"CII National Higher Education Conclave"** at Coddissia Trade fair complex, Coimbatore during 15-16 November 2024.

ELECTRICAL AND ELECTRONICS ENGINEERING

Student Certification

Ms Devadharshini M A, Student of Final B.E. ICE, completed two online certification courses on "**Engineering Psychology"** and **"Perspectives on Neurolinguistic"** through NPTEL and secured **Top Rank** in Engineering Psychology.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Total number of candidates certified in this course: 133

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Head, Centre for Educational Technology
NPTEL Coordinator, IIT Guwahati

Indian Institute of Technology Guwahati

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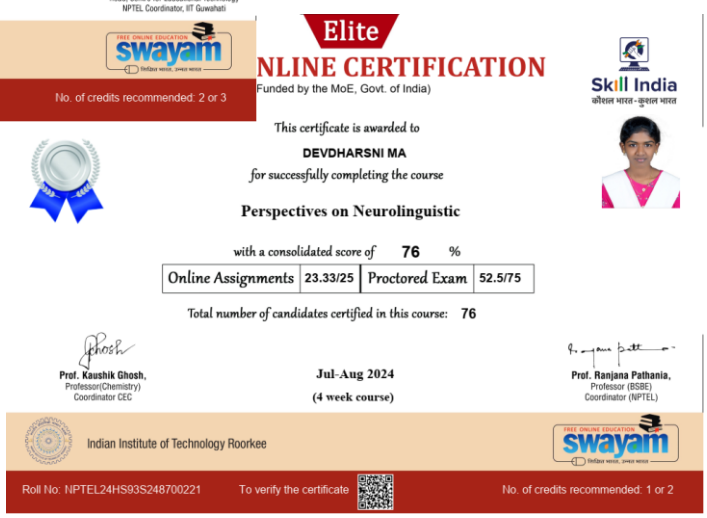
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Skill India

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DEVDHARSNI MA

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Perspectives on Neurolinguistic

with a consolidated score of 76 %

Online Assignments	23.33/25	Proctored Exam	52.5/75

Total number of candidates certified in this course: 76

Prof. Kaushik Ghosh,
Professor(Chemistry)
Coordinator CEC

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(4 week course)

Prof. Ranjana Pathania,
Professor (BSBE)
Coordinator (NPTEL)

Indian Institute of Technology Roorkee

swayam

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INFORMATION TECHNOLOGY

Placement

Ms Kabila B S and **Mr Harish Kumar AV,** Students of Final B.Tech. IT, placed in "**Experian.**"

Ms Kabila B S

Mr Harish Kumar A V

INFORMATION TECHNOLOGY

Student Online Certification

Ms Sjeea Begam S, Student of Second B.Tech. IT, completed the following courses through Infosys Springboard:

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- ReactJS
- Programming Fundamentals : Command Line Interface & Operating System Commands


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INFORMATION TECHNOLOGY

Student Online Certification

Mr T P Sudharsan, Student of Second B.Tech. IT, completed the following courses through Infosys Springboard:

- React Web Developer Certification
- CSS3, C++17 STL Solutions
- C++: Working with Associative Containers & Algorithms
- Java OOPs Concepts
- Java Features

INFORMATION TECHNOLOGY

Student Online Certification

Mr Vishal Kanna V S, Student of Second B.Tech., completed the following courses through Coursera:

- Differential Equations for Engineers
- Getting started with Microsoft Excel
- Prepare, Clean, Transform, and Load Data using Power BI
- Using probability distributions for real world problems in R
- Create IT Diagrams with Lucid Chart
- ChatGPT for Beginners: Using AI for Market Research

MECHANICAL ENGINEERING

Faculty Publication

Dr R B Jeen Robert, Professor, published an article on **"Sustainable Methylene Blue Dye Removal with Activated Carbon from Prosopis Juliflora Stem"** in International Journal of Phytoremediation (Q1, SCI Journal) with an Impact Factor of 3.1 and published by Taylor & Francis Group, llC.

INTERNATIONAL JOURNAL OF PHYTOREMEDIATION
https://doi.org/10.1080/15226514.2024.2427377

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Check for updates

Sustainable Methylene Blue dye removal with activated carbon from Prosopis juliflora stem

Vasiraja N[a], Saravana Sathiya Prabhahar R[a], Joshua A[a], Senthil Maharaj Kennedy[b], and Jeen Robert RB[c]

[a]Department of Mechanical Engineering, Mepco Schlenk Engineering College, Sivakasi, Tamil Nadu, India; [b]Department of Mechanical Engineering, AAA College of Engineering and Technology, Sivakasi, Tamilnadu, India; [c]Department of Mechanical Engineering, Sri Krishna College of Technology, Coimbatore, Tamilnadu, India

ABSTRACT

This study addresses the environmental challenge posed by the invasive Prosopis juliflora plant by converting its stem into activated carbon for the adsorption of Methylene Blue dye from water. The goal is to create an effective and sustainable wastewater treatment solution. Prosopis juliflora stems were harvested, cleaned, dried, carbonized, and activated with zinc chloride to create Prosopis Juliflora Stem Activated Carbon. This activated carbon was characterized using Brunauer-Emmett-Teller surface area analysis, Fourier transform infrared spectroscopy, and scanning electron microscope imaging. Results revealed a significant surface area of 158.107 m^2/g and the presence of functional groups essential for adsorption processes. Batch adsorption experiments were conducted to determine the efficiency of activated carbon in removing Methylene Blue dye at various dosages and contact times. The highest adsorption efficiencies were 73.5% at 80 min, 90.1% at 60 min, and 90.65% at 50 min for dosages of 80, 100, and 120 mg, respectively. These findings show that Prosopis Juliflora Stem Activated Carbon is highly effective at removing Methylene Blue dye, providing a cost-effective and environmentally friendly method of wastewater treatment.

KEYWORDS

Activated carbon; Methylene Blue adsorption; Prosopis juliflora; wastewater treatment

NOVELTY STATEMENT

The novelty of this study lies in the inventive use of Prosopis juliflora stem, an invasive species, to produce an environmentally sustainable and economical activated carbon for the adsorption of Methylene Blue dye from polluted water. This method not only mitigates the environmental issues associated with the extensive proliferation of Prosopis juliflora but also provides a sustainable solution for wastewater management. The work utilizes zinc chloride for activation and characterizes the carbon using modern techniques, including BET surface area analysis, FTIR spectroscopy, and SEM imaging, offering essential insights into the adsorption effectiveness and surface chemistry of the activated carbon. This work uniquely combines the control of an invasive species with the improvement of water purification procedures, so making a substantial contribution to environmental management and water treatment technology, distinguishing it from traditional adsorbent studies.

Introduction

Activated carbon is widely used for the purification of contaminants in both liquid and gaseous phases in a variety of applications, including drinking water treatment (Reza *et al.* 2020; Vilén *et al.* 2022). AC is commonly made from carbon-rich materials (Kielbasa *et al.* 2022; Naji and Tye 2022; Zuhara *et al.* 2022) like coconut shells (Chong and Tam 2020; Yağmur and Kaya 2021), cashew nutshells (Khang *et al.* 2020; Li *et al.* 2022), coal (Beksissa *et al.* 2021; Mashhadimoslem *et al.* 2022), peat, and wood. The activation process increases the surface area of these carbons, improving their adsorption efficiency. This research focuses on the production of activated carbon obtained from Prosopis juliflora, a highly carbonaceous material. The goal is to investigate the preparation method, as well as the physical and adsorption properties of the resulting activated carbon, to determine its efficacy in contaminant removal.

Prosopis juliflora, a nationally recognized invasive species that disrupts biodiversity and infiltrates wildlife reserves, poses significant environmental threats to pastoral and agro-pastoral communities (Tebboth *et al.* 2020; Asefa Bogale and Temesgen 2021). This plant thrives in a variety of climates due to its efficient dispersal mechanisms, prolific nature, large seed bank, coppicing ability, and rapid growth. Its presence can have a negative impact on crop yields, as well as animal and human welfare (Shiferaw *et al.* 2020). Industrial effluent water, a major source of heavy metals, is a serious threat to ecosystems (Alosaimi *et al.* 2020; Soliman and Moustafa 2020). Adsorption processes are commonly used to address this issue, in which the adsorbent's surface interacts with contaminants while preventing them from

CONTACT Jeen Robert RB jeenrobert.rb@skct.edu.in Department of Mechanical Engineering, Sri Krishna College of Technology, Coimbatore - 641042, Tamilnadu, India.

MECHANICAL ENGINEERING

Faculty Participation

Dr R B Jeen Robert Professor, attended a Five-day FDP on **"Metal Additive Manufacturing from Advances to Adaptability"** organised by St Joseph's Institute of Technology, Chennai.

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Professor, Department of Mechanical Engineering,
Sri Krishna College of Technology, Kovaipudur, Coimbatore, 641042
for participating in a Five days online FDP on **"METAL ADDITIVE MANUFACTURING: FROM ADVANCES TO ADAPTABILITY"** organized by the Department of Mechanical Engineering from 4th to 8th, November 2024.

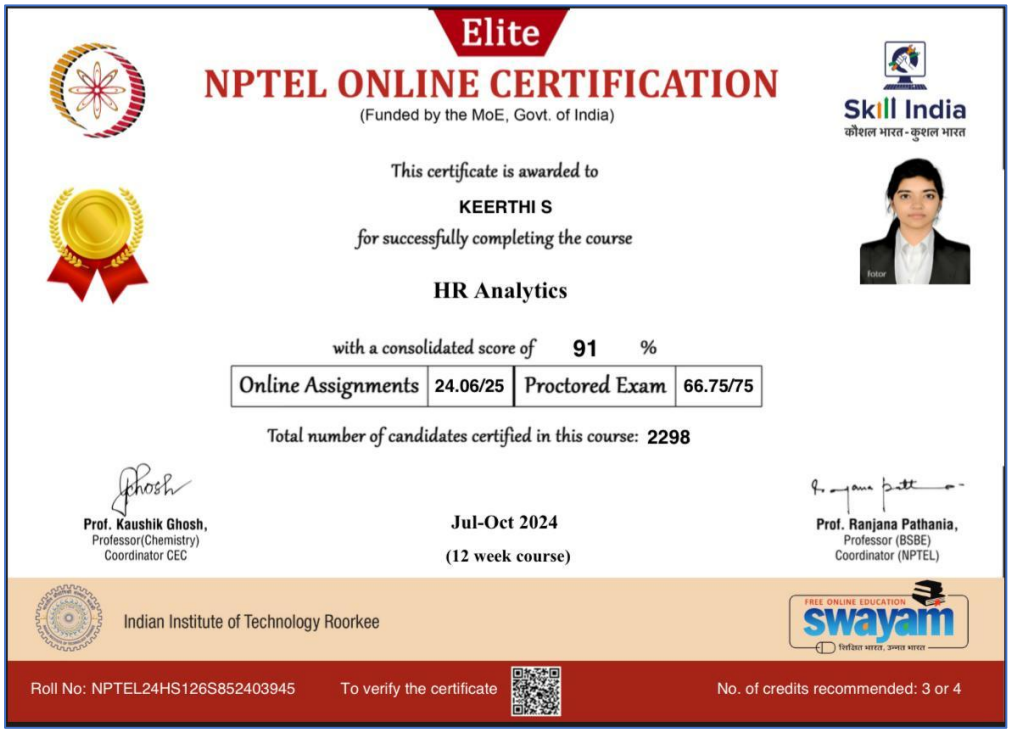
Dr. S. Arivazhagan, M.E, Ph.D.,
Principal

Dr. D. Elil Raja, M.E, Ph.D.,
Professor and Head,
Mechanical Engineering

MASTER OF BUSINESS ADMINISTRATION

Student Achievement

Ms Keerthi S, Student of Second MBA, completed a course on "**HR Analytics"** offered through NPTEL with a consolidated score of 91%.



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for successfully completing the course

HR Analytics

with a consolidated score of 91 %

Online Assignments	24.06/25	Proctored Exam	66.75/75

Total number of candidates certified in this course: 2298

Prof. Kaushik Ghosh,
Professor(Chemistry)
Coordinator CEC

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(12 week course)

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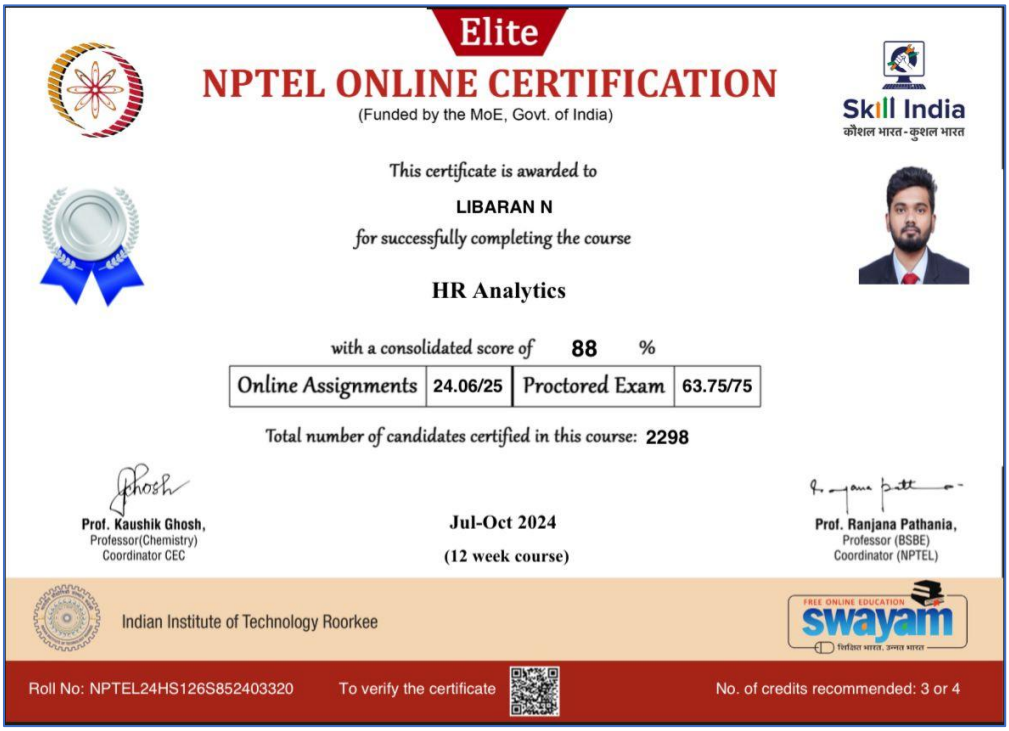
MASTER OF BUSINESS ADMINISTRATION

Student Achievement

Mr Libaran N, Student of Second MBA, completed a course on "**HR Analytics"** offered through NPTEL with a consolidated score of 88%.



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LIBARAN N

for successfully completing the course

HR Analytics

with a consolidated score of 88 %

Online Assignments	24.06/25	Proctored Exam	63.75/75

Total number of candidates certified in this course: 2298

Prof. Kaushik Ghosh,
Professor(Chemistry)
Coordinator CEC

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Prof. Ranjana Pathania,
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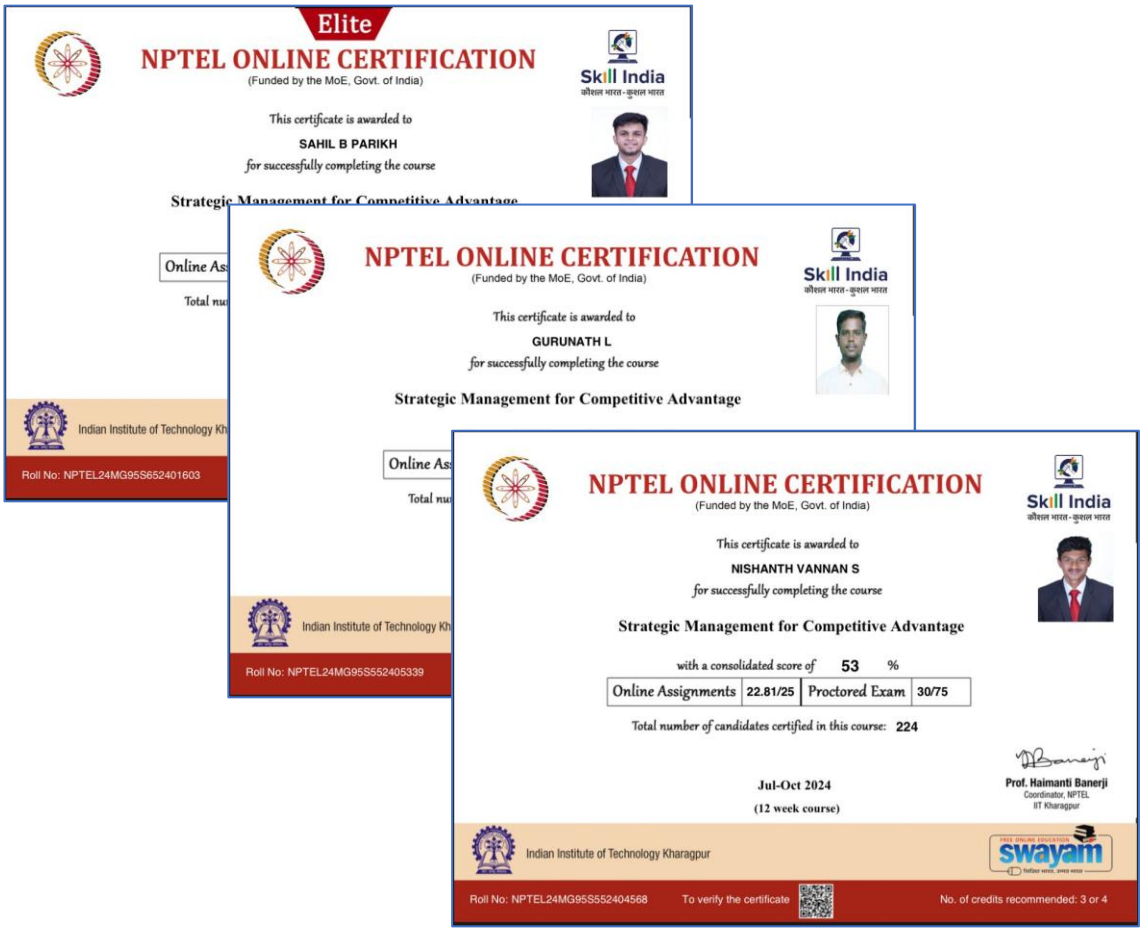
MASTER OF BUSINESS ADMINISTRATION

Students' Certification

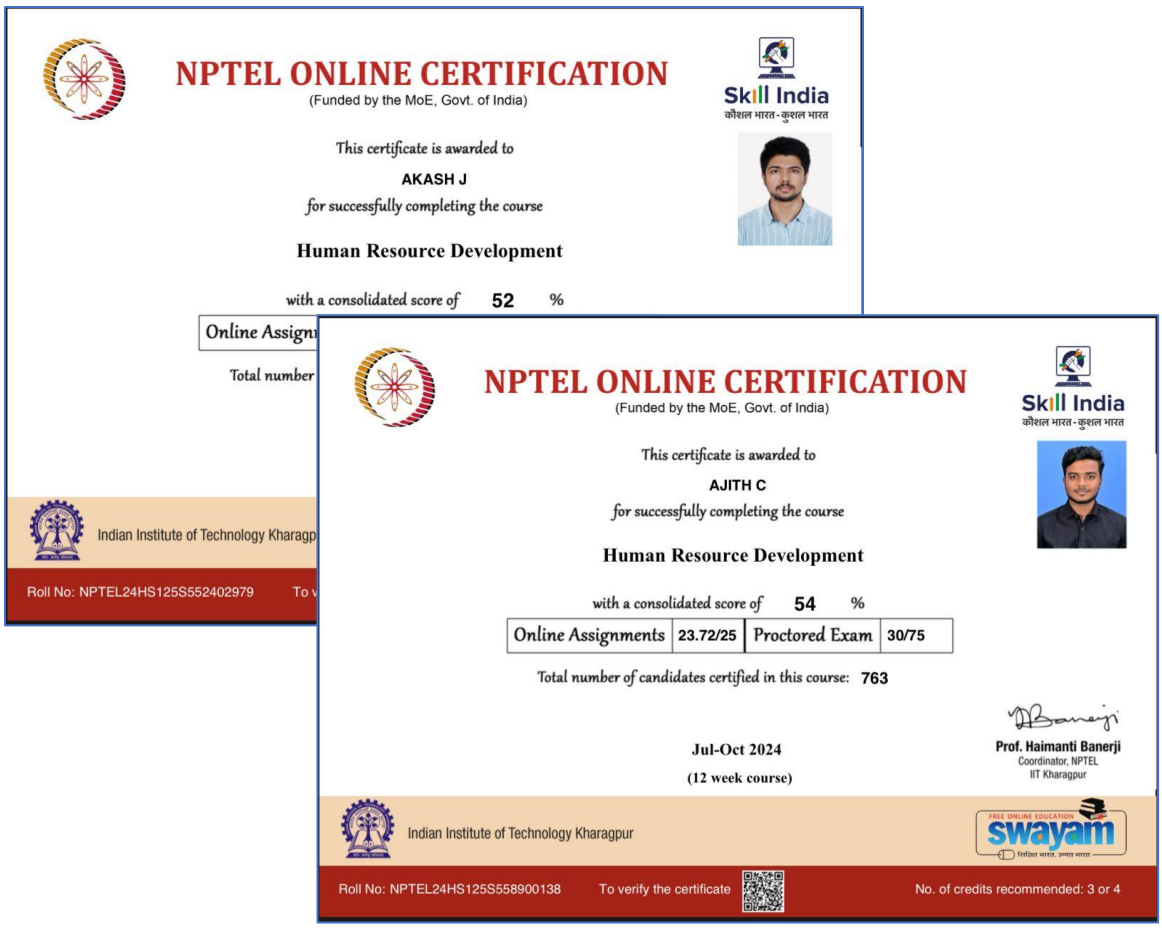
Mr Sahil B Parikh, Mr Gurunath L and **Mr Nishanth Vannan,** Students of Second MBA, completed a course on "**Strategic Management for Competitive Advantage"** through NPTEL.



MASTER OF BUSINESS ADMINISTRATION

Students' Certification

Mr Akash J and **Mr Ajith C,** Students of Second MBA, completed a course on **"Human Resource Development"** through NPTEL.



MASTER OF BUSINESS ADMINISTRATION

Event Organised

The School of Management organised a event on "**Idea to Empire"** as a part of the celebration of **National Entrepreneurship Day** on 09 November 2024.

MASTER OF BUSINESS ADMINISTRATION

Event Organised

The School of Management organised CEO Talk on "**Making Yourself Relevant All the time"** facilitated by **CA C N Ashok,** MD, Autoprint Machinery Manufacturing Pvt. Ltd., Former CII President Coimbatore Zone on 15 November 2024.

SCIENCE AND HUMANITIES

Faculty Participation

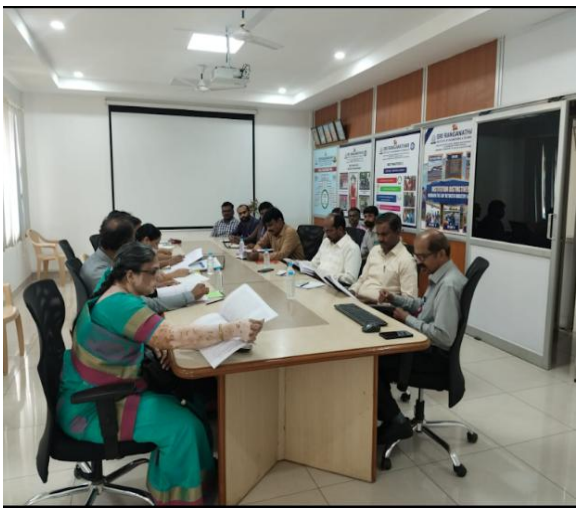
Dr N Nalini, Asst. Professor, participated in a Two-day seminar at Arasu Group of Institution, Karur.

Ms P Jinsha, Asst. Professor, completed a course on **"Deep Learning with Pytorch: Generative Adversarial Network"** on 08 November 2024.

SCIENCE AND HUMANITIES

Faculty Achievement

Dr N Venugopal, Assoc. Professor, served as a **Subject Expert** - **English** in the **Board of Studies Meeting** organised by the Department of Science and Humanities, Sri Ranganathar Institute of Engineering and Technology, Athipalayam, Coimbatore.



SCIENCE AND HUMANITIES

Faculty Achievements

Dr T Bhavani, Ms N Leelavathy, Ms S Santhiya and **Ms V Tharageswari,** the Members of Faculty, completed online certification courses on "**Descriptive Statistics with R Software"** offered through NPTEL.

Faculty Achievements

Ms L Gomathy, Ms R Sheebha Ranjani and **Ms H Shubhajyothi,** the Members of Faculty, completed online certification courses on "**Descriptive Statistics with R Software"** offered through NPTEL.

SCIENCE AND HUMANITIES

Faculty Achievement

Ms P Jinsha, Asst. Professor, completed a course on **"Fundamental of AI & ML"** offered through Infosys Springboard on 11 November 2024.

SCIENCE AND HUMANITIES

Faculty Publication

Dr N Venugopal, Assoc. Professor, published a paper on **"The Impact of Mobile Applications on the Development of Academic Learning"** in IEE Explore. DOI:10.1.109/ICACCS608 74.2024.10717078

2024 10th International Conference on Advanced Computing and Communication Systems (ICACCS)

The Impact of Mobile Applications on the Development of Academic Learning

N. Kavitha
Department of Science and Humanities, Sri Eshwar College of Engineering, Coimbatore, India.
kavithaiacs@gmail.com

T. Anitha
Department of Science and Humanities, Sri Krishna College of Engineering, and Technology Coimbatore, India.

M. Leena Chandrika
Department of Science and Humanities, Sri Ramakrishna Engineering College, Coimbatore, India.

N. Venugopal
Department of Science and Humanities, Sri Krishna College of Technology, Coimbatore, India.

R. Vinupriya
Department of Science and Humanities, Dr. N. G. P. Institute of Technology, Coimbatore, India.

K. M. Priya
Department of Science and Humanities, Sri Eshwar College of Engineering, Coimbatore, India.

Abstract **- The educational mobile application market, particularly for second or foreign language learning, has swiftly expanded owing to the incorporation of mobile technology into educational practices and the evolution of smartphones. However, there is a scarcity of research about the impact of mobile applications on the process of learning the language. Mobile Learning incorporates the utilization of technologies like smartphones and iPads to facilitate the acquisition of a new language by pupils. Acquiring English as a second language has become significantly more convenient due to the abundance of applications currently accessible. This research entails categorizing mobile applications based on the educational stages of elementary, secondary, and higher education students. The analyzed literature predominantly focuses on exploring the utilization, assessment, and appraisal of mobile applications within language instruction settings. The research also encompassed an examination of mobile app design, technique, theory, and pedagogical features. It is crucial to have in mind that these programs are specifically created to enhance students' language proficiency. Therefore,**

advanced technology and software, rendering them equally capable as computers. Based on the findings of [2], it has been observed that smartphones offer notable advantages compared to pre-smartphone mobile devices, as evidenced by several studies. Fluency and mastery of the target language are mostly attained through the instruction of vocabulary. The quest for the optimal approach to language instruction has been ongoing. Proficiency in idiomatic expressions, which are often used non-literal words and phrases, is crucial for effective communication in a language. Failure to use idiomatic expressions competently can pose communication difficulties for language learners, as it may result in sounding unnatural and inauthentic. Acquiring proficiency in these words and phrases is crucial for achieving fluency in your desired language. The ability to use idiomatic expressions is widely recognized as an indicator of proficiency in the target language [4-7]. Language plays a vital role in the global arena, serving as a

ation Systems (ICACCS) | 979-8-3503-8438-9/24/$31.00 ©2024 IEEE | DOI: 10.1109/ICACCS60874.2024.10717048

SCIENCE AND HUMANITIES

Event Organised

The Dept. of Science and Humanities organised a discussion and brainstorming session on "**Generative AI"** on 14 November 2024.

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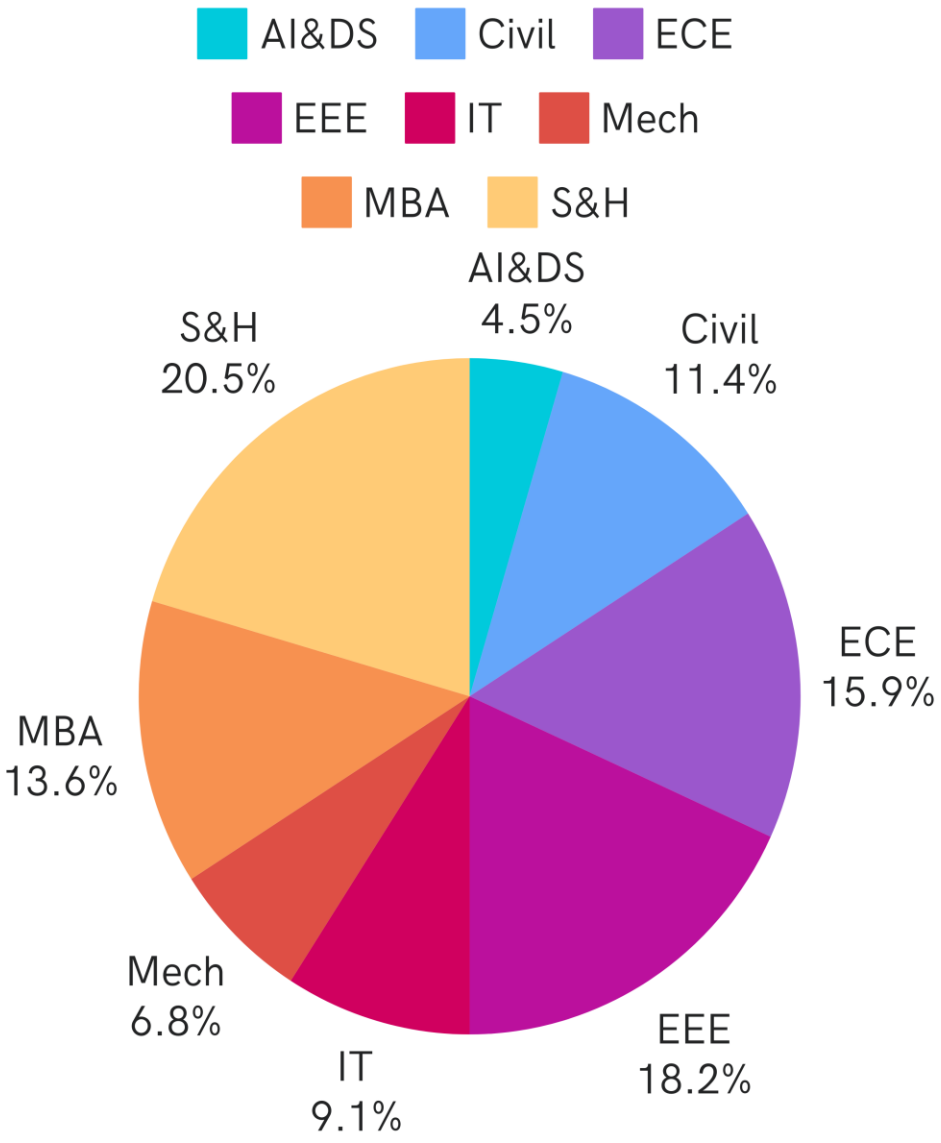

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