Report on

Five-Day Faculty Development Program

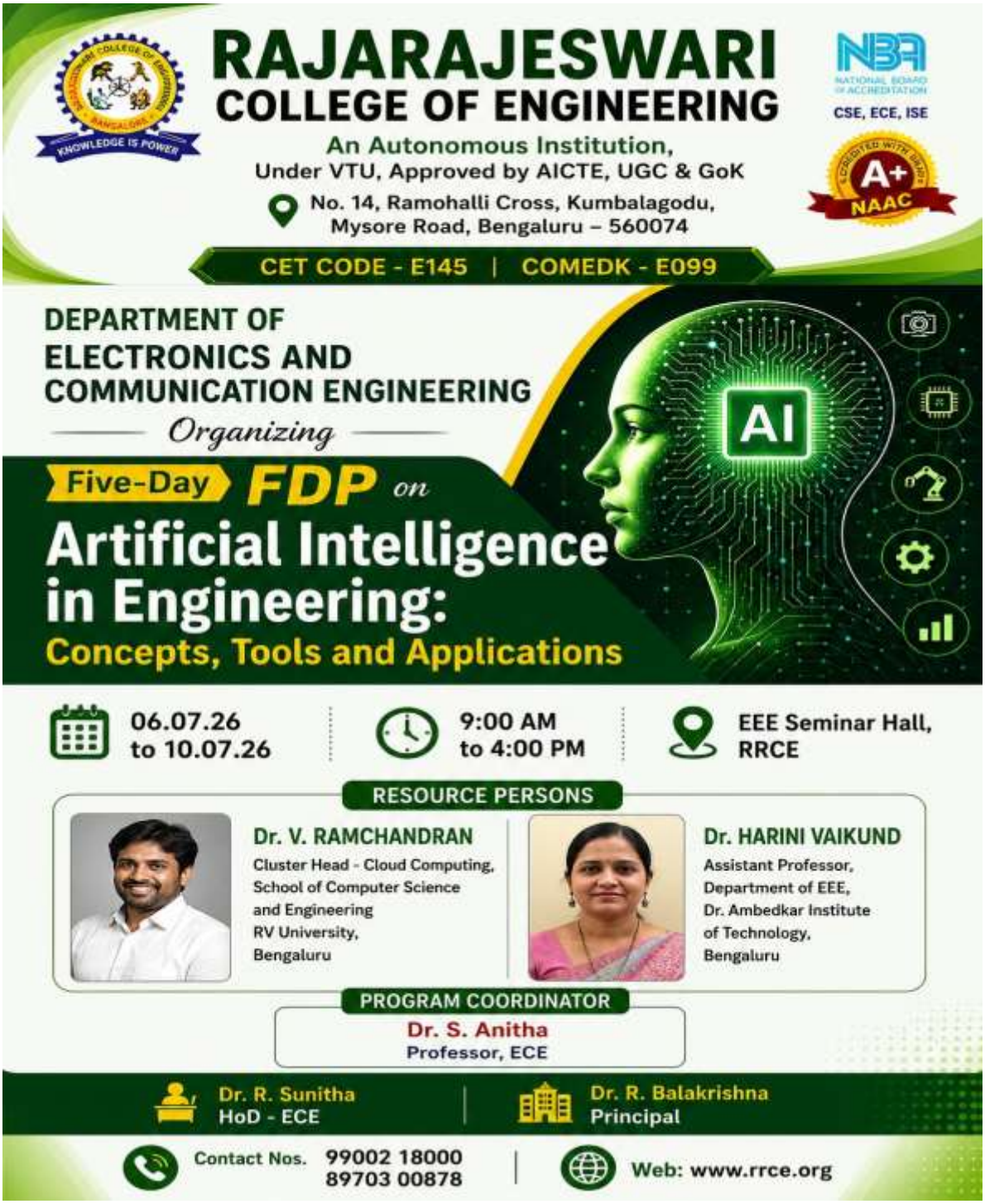
on

"ARTIFICIAL INTELLIGENCE IN ENGINEERING: CONCEPTS, TOOLS AND APPLICATIONS"

Dates: 06th July 2026 to 10th July 2026
Venue & Time: ECE Labs (10.00AM-12:30PM and 2.00PM-4.00PM)

Artificial Intelligence is transforming the engineering landscape by enabling intelligent systems that can learn, reason, and make data-driven decisions with minimal human intervention. AI technologies such as Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, and Generative AI are being widely adopted across various engineering disciplines to solve complex problems, improve system efficiency, automate processes, and support innovation. From predictive maintenance in manufacturing and smart healthcare systems to autonomous vehicles, robotics, communication networks, and sustainable energy solutions, AI has become an indispensable tool for modern engineers.

This program is designed to provide participants with a comprehensive understanding of AI fundamentals, popular development tools, and real-world engineering applications. Through a combination of theoretical concepts, practical demonstrations, and case studies, participants will gain the knowledge and skills required to leverage AI technologies in engineering research, teaching, and industrial practice.


RAJARAJESWARI
COLLEGE OF ENGINEERING
An Autonomous Institution,
Under VTU, Approved by AICTE, UGC & GoK
No. 14, Ramohalli Cross, Kumbalagodu,
Mysore Road, Bengaluru – 560074
CSE, ECE, ISE
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CET CODE - E145 | COMEDK - E099
DEPARTMENT OF
ELECTRONICS AND
COMMUNICATION ENGINEERING
Organizing
Five-Day FDP on
Artificial Intelligence in Engineering:
Concepts, Tools and Applications
AI
06.07.26
to 10.07.26
9:00 AM
to 4:00 PM
EEE Seminar Hall,
RRCE
RESOURCE PERSONS
Dr. V. RAMCHANDRAN
Cluster Head - Cloud Computing,
School of Computer Science
and Engineering
RV University,
Bengaluru
Dr. HARINI VAIKUND
Assistant Professor,
Department of EEE,
Dr. Ambedkar Institute
of Technology,
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PROGRAM COORDINATOR
Dr. S. Anitha
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Objectives of the FDP

- Understand the fundamental concepts, principles, and evolution of Artificial Intelligence.
- Learn data preprocessing, model development, training, testing, and evaluation techniques.
- Understand the role of AI in solving engineering problems across different domains.
- Explore AI applications in Electronics, Electrical, Mechanical, Civil, Computer Science, Medical Electronics, and Industrial Engineering.
- Gain hands-on exposure to AI-based engineering case studies and practical demonstrations.
- Identify current research trends, ethical considerations, and future opportunities in AI-driven engineering solutions.

PROGRAM OUTCOME

At the end of this FDP, the participants will be able to:

- Explain the core concepts and working principles of Artificial Intelligence.
- Differentiate between various AI techniques and identify suitable approaches for engineering applications.
- Use popular AI tools and software platforms to build basic intelligent applications.
- Analyze engineering datasets and apply AI models for prediction, classification, and decision-making.
- Design simple AI-based solutions to address real-world engineering challenges.
- Evaluate AI model performance using appropriate performance metrics.
- Understand recent advancements and emerging trends in AI for engineering.
- Apply AI knowledge in academic research, industrial projects, and interdisciplinary problem-solving.

RESOURCE PERSON 1(6th July to 8th July)

Dr.V.RAMACHANDRAN

Dr. V.RAMACHANDRAN is an accomplished academician, researcher, and educator with over a decade of teaching and research experience in Computer Science, Artificial Intelligence, Machine Learning, Internet of Things (IoT), and Smart Agriculture. Currently serving as an **Assistant Professor at the School of Computer Science and Engineering, RV University, Bengaluru**, he has previously held faculty positions at prestigious institutions including GITAM University, GRIET Hyderabad, Malla Reddy University, Shri Shakthi Institute of Engineering and Technology, and Sree Sowdambika College of Engineering. Holding a Ph.D. in Computer Science and Engineering from Kalasalingam Academy of Research and Education, the research focuses on IoT-enabled smart irrigation and intelligent recommendation systems for sustainable agriculture. He has published several high-impact research papers in reputed SCI and Scopus-indexed journals, secured research grants worth nearly **₹1 crore**, and serves as a Co-Principal Investigator for healthcare technology projects. With expertise spanning AI, Deep Learning, IoT, Federated Learning, Cyber-Physical Systems, and Smart Healthcare, Dr. V.RAMACHANDRAN is also an active resource person, delivering invited talks and workshops in AI and emerging technologies, while contributing significantly to academic research, innovation, and technology-driven societal development.

RESOURCE PERSON 2(9th July to 10th July)

DR. HARINI VAIKUND

Dr. Harini Vaikund is an Assistant Professor in the Department of Electrical and Electronics Engineering at Dr. Ambedkar Institute of Technology, Bengaluru, with over 13 years of teaching experience and valuable international industry exposure. She holds a Ph.D. in Electrical and Electronics Engineering from Visvesvaraya Technological University, an M.Sc. in Electrical Engineering (Microelectronics and System Design) from the University of Applied Sciences, Darmstadt, Germany, and a Bachelor's degree in Electrical and Electronics Engineering from the University of Madras. Her research interests include microgrids, renewable energy systems, energy management, smart grids, power systems, and artificial intelligence applications in electrical engineering. She has published several research papers in reputed SCI, Scopus-indexed, Q1 and Q2 journals, authored a Springer book chapter, and presented papers at national and international conferences. She is the recipient of the **Best Researcher Award (2025)** and **Best Paper Award (2024)** and is currently leading an **MSME-funded project** on an AI-powered digital platform for enhancing traditional trades. Her expertise spans embedded systems, FPGA design, VHDL, MATLAB, ETAP, MiPower, and intelligent control systems, reflecting her commitment to excellence in teaching, research, and innovation.

DAY1 : Technical paper writing

Morning Session: Research Paper Foundations

Artificial Intelligence is a rapidly evolving branch of computer science that focuses on developing intelligent systems capable of performing tasks that typically require human intelligence, such as learning, reasoning, problem-solving, decision-making, language understanding, and visual perception. By leveraging techniques such as Machine Learning, Deep Learning, Natural Language Processing, Computer Vision, and Generative AI, AI enables computers to analyze large volumes of data, recognize patterns, and make informed decisions with minimal human intervention. Today, AI has become a transformative technology across engineering disciplines, driving innovations in healthcare, manufacturing, robotics, autonomous vehicles, smart agriculture, communication systems, cybersecurity, and industrial automation. As AI continues to reshape industries and research, it has emerged as an essential tool for engineers, researchers, educators, and professionals to develop intelligent, efficient, and sustainable solutions to complex real-world challenges.

Afternoon Session:

Hands-on Session: Large Language Models (LLMs)

This hands-on session introduces participants to **Large Language Models (LLMs)** and their practical applications in engineering, research, and education. Participants will learn the fundamentals of LLMs, including how transformer-based models work, prompt engineering techniques, and the effective use of AI assistants for content generation, coding, data analysis, and research support. Through guided exercises, participants will gain practical experience using tools such as **ChatGPT, Google Gemini, Claude, Microsoft Copilot, and Perplexity AI** for literature review, summarization, programming assistance, document generation, research paper drafting, data interpretation, and presentation preparation. The session will also cover best practices for writing effective prompts, evaluating AI-generated responses, ensuring responsible and ethical use of LLMs, and understanding their limitations. By the end of the session, participants will be able to confidently leverage LLMs to enhance productivity, accelerate research, and solve real-world engineering and academic problems.

Day 2: AI-Assisted Research Paper Development

Morning Session: Fundamentals of Research Paper Writing

The morning session introduces participants to the fundamentals of research paper writing, including identifying research problems, defining research objectives, finding research gaps, conducting systematic literature reviews, selecting appropriate journals, understanding publication ethics, and organizing a research manuscript using the IMRAD (Introduction, Methods, Results, and Discussion)

structure. Participants will also learn best practices for scientific writing and effective research planning.

Afternoon Session: Hands-on with Claude AI and Google Gemini for Research Paper Writing

The afternoon session provides hands-on training on using **Claude AI** and **Google Gemini** as AI research assistants. Participants will learn effective **prompt engineering** techniques to generate research ideas, identify research gaps, perform literature reviews, summarize research articles, draft abstracts, introductions, methodologies, and conclusions, refine technical writing, and generate tables, figures, and flowcharts. The session emphasizes writing high-quality prompts, validating AI-generated content, improving academic writing, and using AI responsibly to support—not replace—original research.

Day 3: Manuscript Development and Publication

Morning Session: Constructing and Refining a Research Paper

The morning session focuses on developing a complete research manuscript, including writing the literature review, methodology, experimental results, discussion, conclusion, and references. Participants will learn techniques for presenting results effectively using tables, graphs, and performance metrics, writing impactful discussions, and aligning manuscripts with the expectations of high-quality journals.

Afternoon Session: Hands-on with Claude AI and Google Gemini for Manuscript Enhancement and Publication

The afternoon session offers practical experience in using **Claude AI** and **Google Gemini** to edit, proofread, and enhance research manuscripts. Participants will use advanced prompts to improve clarity, coherence, grammar, academic tone, and technical accuracy; generate reviewer response drafts; prepare cover letters; format manuscripts according to IEEE, Springer, and Elsevier guidelines; and optimize keywords and titles for better visibility. By the end of the session, participants will have developed a publication-ready manuscript while gaining confidence in leveraging AI tools ethically and effectively throughout the research and publication process.

Day 4

Morning Session:

The morning session focused on **Advanced AI Techniques and Intelligent Engineering Systems**. The resource person explained advanced machine learning and deep learning architectures, including Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), Long Short-Term Memory (LSTM) networks, Transformers, and Generative AI. The session highlighted how these technologies have transformed engineering applications such as predictive maintenance, computer vision,

autonomous systems, smart manufacturing, healthcare engineering, robotics, and the Industrial Internet of Things (IIoT). Several real-world case studies were presented to demonstrate the successful implementation of AI across various engineering domains.

Afternoon Session:
The afternoon session was conducted as a **Hands-on Workshop on AI Model Development and Deployment**. Participants were introduced to the complete AI workflow, including data preprocessing, feature engineering, model training, testing, and performance evaluation using Python and popular AI frameworks such as Scikit-learn, TensorFlow, and PyTorch. The session also covered evaluation metrics such as accuracy, precision, recall, F1-score, confusion matrix, and ROC curve. Demonstrations on deploying AI models using cloud platforms and edge AI devices enabled participants to gain practical exposure to developing end-to-end AI solutions for engineering applications.

Day 5

Morning Session:

The morning session focused on **Emerging Trends, Ethical AI, and Future Directions in Engineering**. The resource person discussed recent advancements in Artificial Intelligence, including Explainable AI (XAI), Responsible AI, Federated Learning, Digital Twins, Industry 5.0, AI-powered Cyber-Physical Systems, Quantum AI, and Generative AI. The session also emphasized the importance of ethical AI practices, data privacy, model transparency, and responsible deployment of intelligent systems. Participants gained insights into current research trends, funding opportunities, interdisciplinary collaborations, and the integration of AI into engineering education and research.

Afternoon Session:

The afternoon session featured an **Expert Talk on Future Scope of Artificial Intelligence in Engineering and Research**, highlighting the evolving role of AI in addressing complex engineering challenges across domains such as healthcare, manufacturing, smart cities, robotics, autonomous systems, and sustainable technologies. The speaker also discussed emerging research opportunities, industry expectations, innovation pathways, and career prospects in AI-driven engineering. This was followed by an interactive feedback session, during which participants shared their experiences and learning outcomes from the five-day Faculty Development Programme. The programme concluded with the **Valedictory Ceremony**, which included the presentation of a summary of the FDP, distribution of certificates to the participants, acknowledgment of the resource persons and organizing committee, and a formal vote of thanks, marking the successful completion of the programme.

Senitha R
[Dr. Senitha. R]
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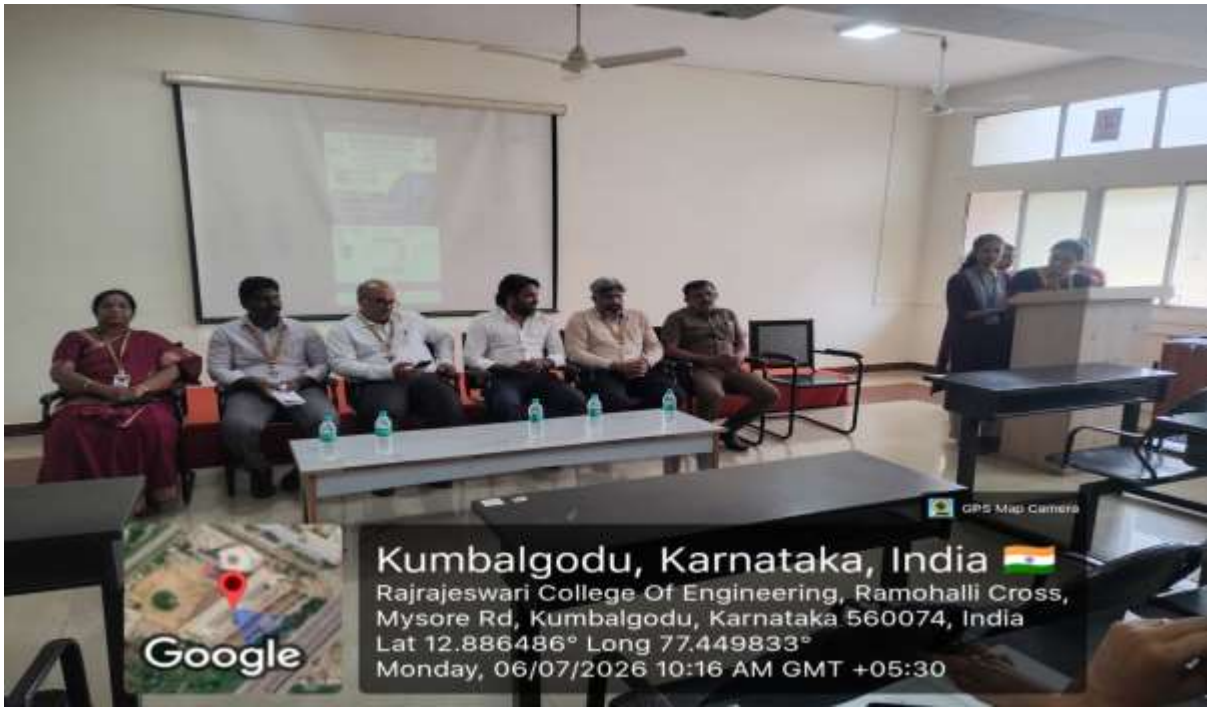
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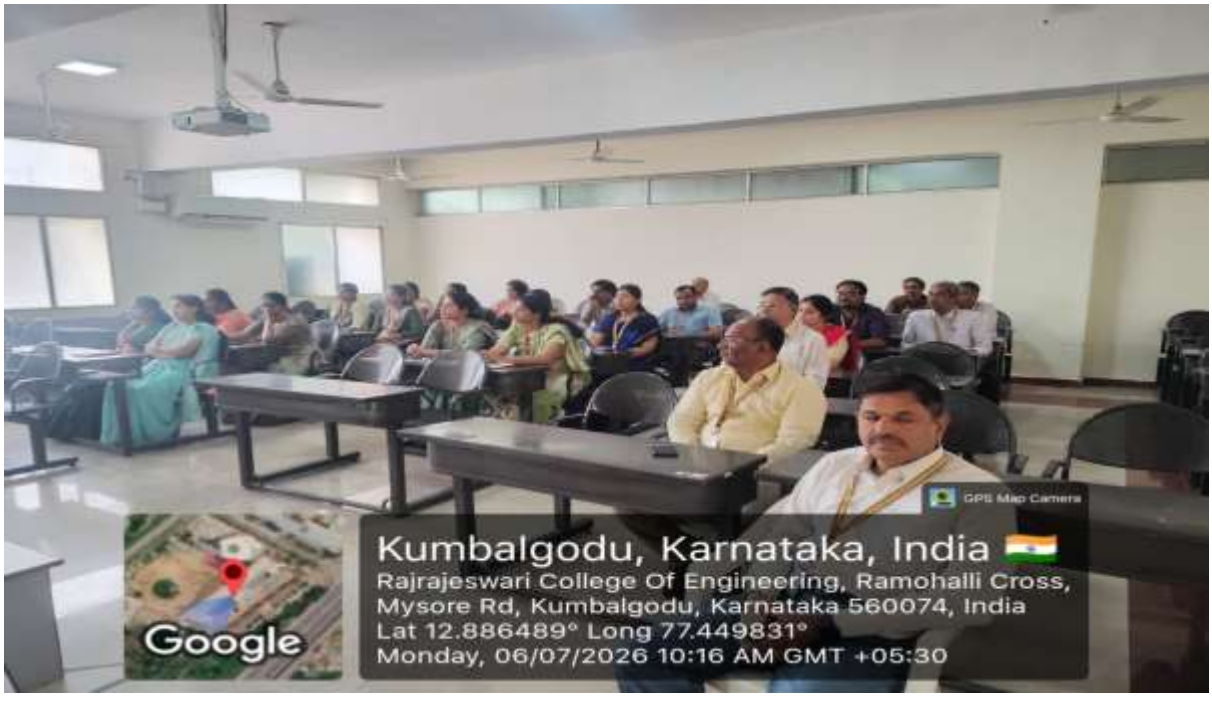
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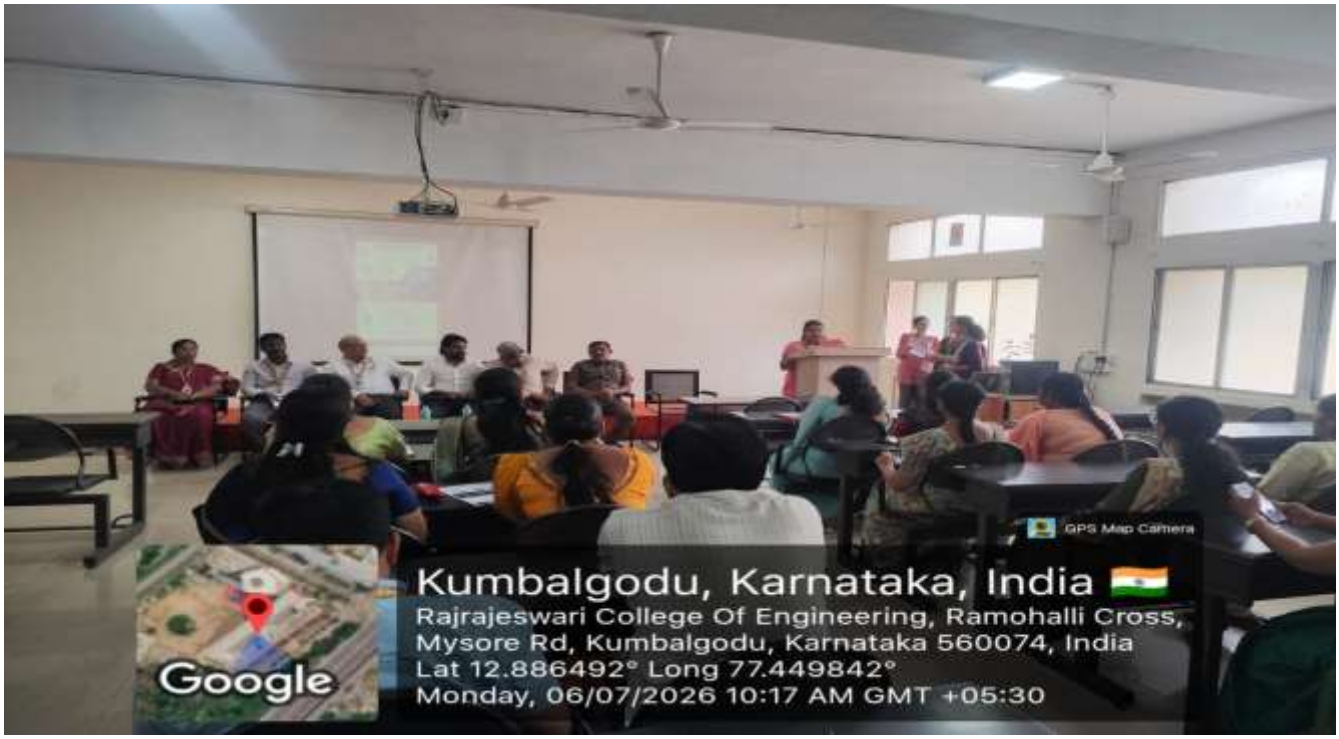
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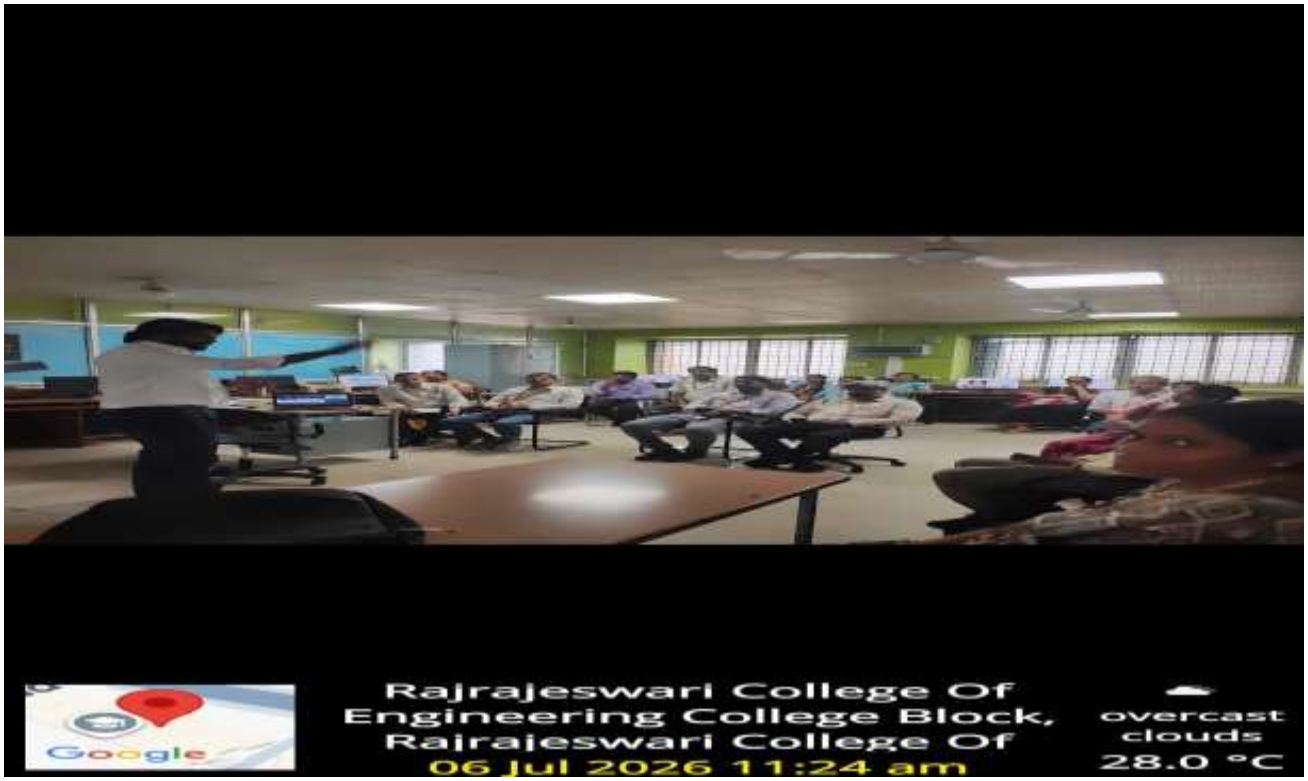
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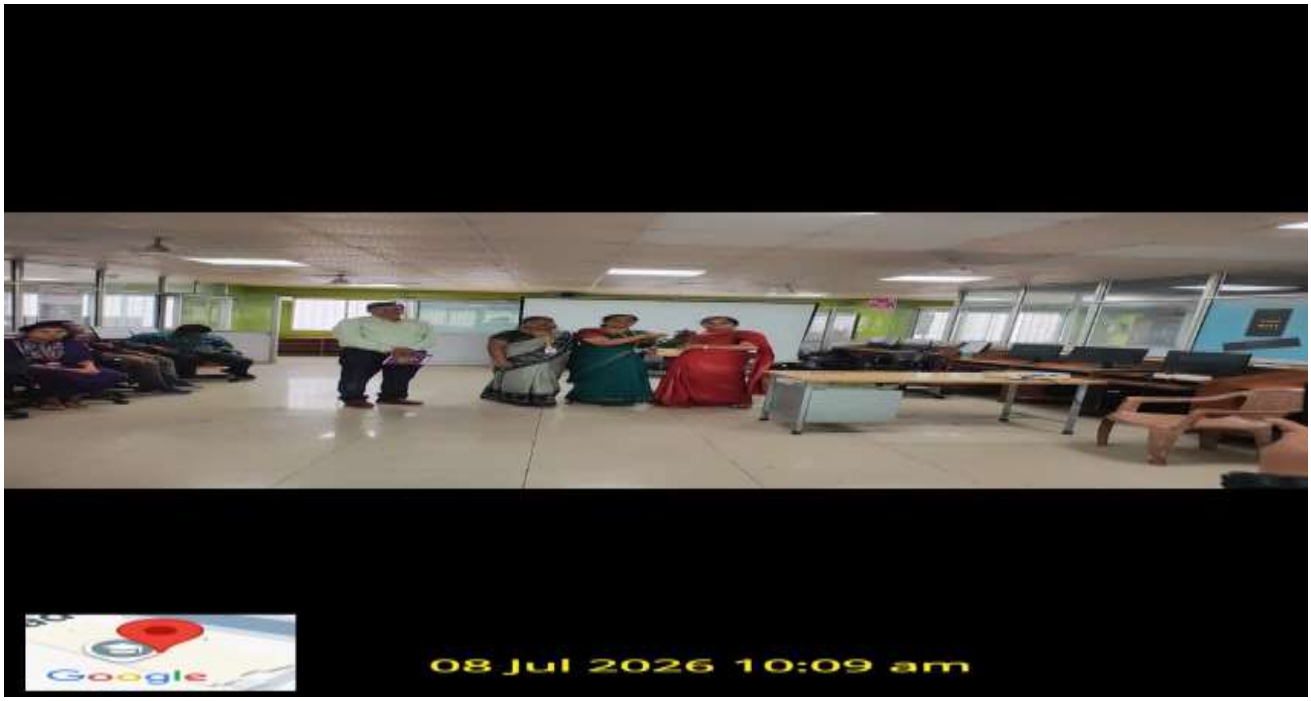
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