JAN- JUN
2025

TULA'S DEHRADUN INSTITUTE | NAAC A+

Department of Computer Applications

Binary Beats

OUTLINE

Overview of the Department

The Master of Computer Applications (MCA) is more than just a postgraduate degree—it is a gateway to advanced, specialized careers in the world of technology. Designed for aspiring tech leaders, this program offers in-depth expertise in software development, data science, artificial intelligence, and cybersecurity. In today's era of rapid digital transformation, the demand for skilled professionals in computer applications continues to grow at an unprecedented pace.

At the Department of Computer Applications, students gain a strong foundation in computer science while developing advanced professional skills in software development and problem-solving. The program nurtures practical abilities, preparing graduates to overcome real-world challenges in programming and applications. Beyond industry roles, MCA graduates also unlock opportunities in the education sector, shaping future generations of tech innovators.

With an MCA, you don't just follow the technology wave—you lead it. Step confidently into a future brimming with possibilities and leave your mark in the ever-expanding digital world.

🌟**Industry-Driven Curriculum – Stay ahead with courses tailored to the latest trends in AI, machine learning, cloud computing, and software engineering.**

💻 **Experiential Learning – Build confidence through hands-on projects, internships, and cutting-edge lab facilities that mirror real-world industry practices.**

👩‍🏫 **Renowned Faculty – Learn from experienced professors who bring together academic excellence, industry expertise, and research insights.**

🤝 **Robust Industry Links – Access opportunities for internships, collaborations, and networking with leading global tech companies.**

🎯 **Career Empowerment – Benefit from personalized career counseling, resume-building workshops, and interview preparation to achieve your dream role.**

🚀 **Entrepreneurial Edge – Transform your ideas into reality with the support of startup incubation, innovation hubs, and expert mentorship.**

🌱 **Holistic Growth – Sharpen your communication, leadership, and soft skills through extracurricular activities and personality development programs.**

Departmental Vision & Mission

DEPARTMENTAL VISION -

To be a centre of excellence in education of computer applications, software development, research, and technology services, while empowering the students to become innovative and responsible global professionals.

DEPARTMENTAL MISSION -

- **To provide education that meets the evolving needs of the software development and technology services industry.**
- **To nurture a thriving research ecosystem that inspires and supports interdisciplinary teamwork.**
- **To focus on innovation, address real-world challenges, and link academic insights with practical applications.**
- **To empower students by providing practical learning experiences, personalized mentorship, and opportunities for global engagements.**
- **To instil ethical values and a spirit of social commitment.**

PEO's-

PEO1: Ethics and Social Responsibility: A well-prepared graduate with ethical values, integrity, and sense of social responsibility shall apply technical skills to serve the society and the industry with positive benefit.

PEO2: Innovative Problem Solving: Graduates will have robust problem-solving abilities and the ability to apply innovative, thinking techniques in their work toward designing, developing, and implementing software solutions for problems of increasingly complex change in a rapidly dynamic technological landscape.

PEO3: Global Competence and Lifelong Learning: Graduates will be equipped with a comprehensive education in computer applications, meeting the international standard, and continue a process of learning about new technologies and trends over time.

PEO 4: Industry Collaboration and Research Excellence: All graduates will enjoy partnerships with the software industries and research institutes, thus having hands-on experiences in projects and research on advanced technology areas, improving their skills in collaborative and independent research.

From The Faculty Desk

Dr. Shikha Tayal Aeron

In the ever-evolving realm of academia, every six months present us with a unique blend of challenges and opportunities. Looking back at this half-year, it is clear that our department has navigated these complexities with resilience, innovation, and an unwavering commitment to excellence. Through teamwork and creative approaches, we have not only addressed the immediate challenges but also laid a strong foundation for future growth and success.

Our commitment to advancing knowledge and creating meaningful impact is evident in our research endeavors and transformative teaching practices. The journey has not been without its hurdles—these past six months have tested our perseverance and creativity. Yet, it is precisely through overcoming such obstacles that we have uncovered fresh opportunities for learning, growth, and innovation.

As we move into the next phase, let us carry forward the experiences and progress of these six months. Together, let us continue to embrace change, nurture collaboration, and push the boundaries of what is possible in our respective fields.

Dr.Musheer Waqur

In the spirit of growth, our department remains deeply committed to mentorship. As mentors, we plant the seeds of knowledge, nurture aspiring minds, and witness their transformation into the leaders of tomorrow. This culture of guidance not only shapes individual journeys but also strengthens the enduring legacy of our department.

In today's fast-paced world of technology, learning is a lifelong journey. Our department proudly embraces a culture of continuous growth, motivating both faculty and students to explore new horizons. By fostering curiosity and innovation, we empower ourselves to adapt, evolve, and thrive in the ever-changing landscape of computer science.

I extend my heartfelt appreciation to our editorial team for their dedication in bringing out the departmental newsletter with consistency and excellence, capturing and celebrating the diverse achievements that make our department shine.

List Of Faculty Members

Dr. Priya Matta
(HoD)

Dr.Sanjeev Kumar

Dr.Musheer Waqur

Dr. Ahmad Jamal

Dr. Shikha Aeron

Dr. Rakesh Kumar

Mr. Aizaz Ahmad

Mr. Siddhart Sharma

EDITORIAL TEAM

Mr. Aizaz Ahmad
Faculty Coordinator

Anurag Thapa
Student MCA

Kishan Bahadur
Student MCA

Anjali Sharma
Student MCA

DEPARTMENTAL EVENTS

Industrial Visit to Innovation and Virtual Lab at UCOST

The Department of Computer Applications organized an industrial visit to the Regional Science Center (UCOST), Dehradun, on 4th February 2025 as part of UCOST's 9th Foundation Day celebration. The event was graced by eminent personalities including IAS Nitesh Jha, Prof. Durgesh Pant (Director UCOST), and Dr. Ram Karan Singh (VC, ICFAI University).Students and faculty witnessed a vibrant showcase of scientific research, innovation, and technological advancements. The program featured expert talks, panel discussions, and exhibitions on climate change, renewable energy, biotechnology, digital transformation, and AI. Recognition was given to scientists and innovators for their contributions, while startups and institutions displayed sustainable technologies and models.The visit provided hands-on learning, interdisciplinary exposure, and career insights, inspiring students to think innovatively, understand sustainability challenges, and explore research-oriented careers. Overall, the event nurtured scientific curiosity and practical learning, enriching both faculty and students alike.

DEPARTMENTAL EVENTS

Drone Awareness Workshop VMSB UTU

The Department of Computer Applications, Tula's Institute, organized an industrial visit to VMSB Uttarakhand Technical University, Dehradun, on February 28, 2025, for a Drone Awareness Workshop Program. The workshop began with an inaugural session by Mr. R.S. Singh (Managing Director, Dornier Avigation) and university officials, emphasizing the rising importance of drone technology across industries. Expert speakers conducted sessions on drone mechanics, components, flight dynamics, and applications, while also discussing the regulatory framework and safety guidelines governing drone usage in India.
Students gained hands-on exposure through live demonstrations of drone operations, bridging the gap between theoretical knowledge and practical application. The event concluded with an interactive Q&A session and a vote of thanks. Overall, the program provided valuable insights, fostering technical awareness, practical skills, and industry readiness among participants.

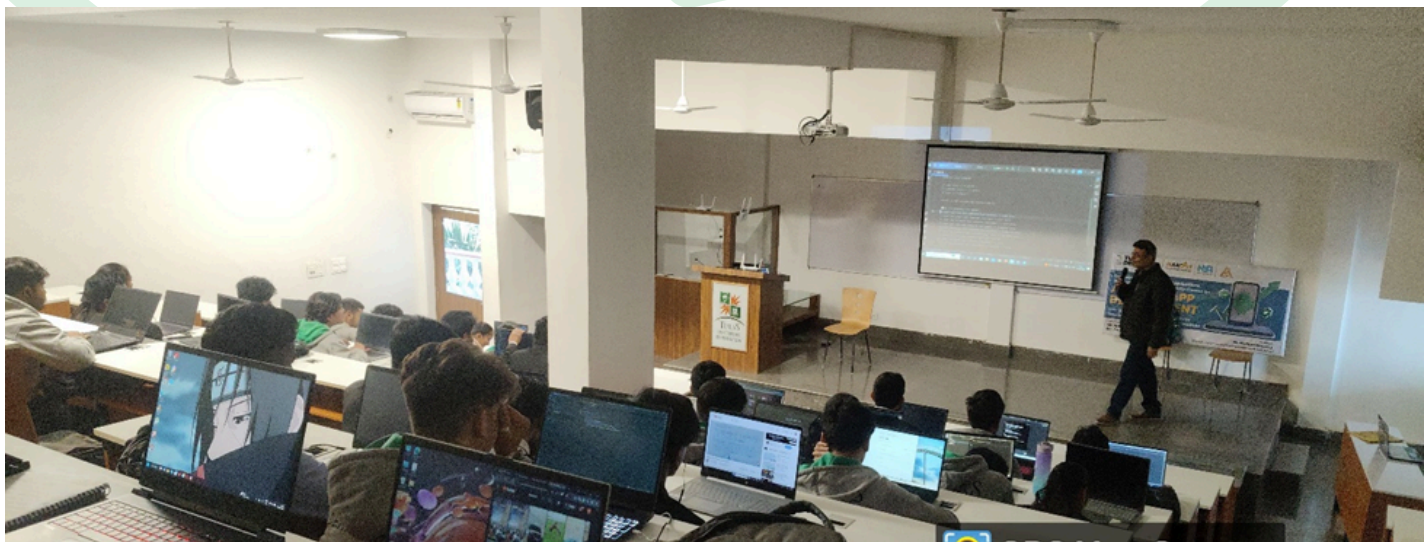
DEPARTMENTAL EVENTS

Android App Development(Add-on Course)

The Department of Computer Applications organized a two-week Add-on Certification Course on Android App Development for MCA students from 17th–28th February 2025.

The program focused on Kotlin programming, UI/UX design, API integration, database handling, Firebase, Jetpack Compose, and app deployment. Students also developed capstone projects like a Notes App and a Todo App, gaining practical exposure.

This certification course effectively bridged the gap between academic knowledge and industry requirements, equipping MCA students with hands-on skills, problem-solving abilities, and industry readiness for mobile app development careers.During the course, students worked on capstone projects such as a Notes App and a Todo App, allowing them to apply their skills in real-world scenarios. This hands-on approach not only reinforced programming concepts but also familiarized learners with the complete app development lifecycle, from coding and debugging to publishing on the Play Store.



DEPARTMENTAL EVENTS

Honeywell Training on “Sustainability Studies”

The Honeywell Training on Sustainability Studies was organized by the Department of Computer Applications to provide students with comprehensive knowledge and practical experience in sustainability. The program aimed to equip students with foundational and applied insights into climate science, green technologies, and sustainable business practices. Through workshop-based sessions, participants gained hands-on experience to implement sustainable practices in real-world scenarios.

The training emphasized awareness of social and environmental responsibilities, empowering students to act as sustainability advocates in their communities and future careers. Delivered in an interactive format, the sessions combined theoretical understanding with practical applications such as life cycle assessment, energy-efficient solutions, and corporate social responsibility practices.

DEPARTMENTAL EVENTS

AWS Cloud Practitioner (Add on Course)

The Add-on AWS Cloud Practitioner Course was organized by the Departments of Computer Applications and Computer Science & Engineering at Tula's Institute to provide postgraduate students with a comprehensive understanding of cloud computing and AWS services. The program integrated theoretical concepts with practical, hands-on exercises, ensuring alignment with industry-relevant cloud skills.
The course commenced with an introductory session highlighting the significance of cloud computing in modern IT infrastructure. The training was structured into phases covering Cloud & AWS Fundamentals, Networking & Security, Advanced AWS Concepts, and Capstone Projects. Key topics included EC2, S3, IAM, RDS, VPC, DynamoDB, CloudWatch, SNS, Elastic Load Balancer, Auto Scaling, AWS Lambda, CloudTrail, and cost management strategies. Each session incorporated interactive demonstrations and Q&A segments to reinforce learning.

DEPARTMENTAL EVENTS

Industrial Visit to WIT for ACM-ROCS Workshop

The ACM-ROCS Workshop was held at the Women Institute of Technology (WIT), located on the scenic campus of Veer Madho Singh Bhandari Uttarakhand Technical University (VMSB UTU) in Dehradun, Uttarakhand. The venue offered a serene and academically rich environment, ideal for interactive learning and professional engagement. Participants experienced insightful sessions on research opportunities in computer science, surrounded by the modern infrastructure and natural beauty of the WIT campus. The visit provided students with valuable exposure to current trends in technology and academia, making it a truly enriching industrial visit. The ACM-ROCS (Research Opportunities in Computer Science) workshop aims to highlight research paths in computer science, featuring expert talks in theoretical CS, computing systems, and machine learning.

DEPARTMENTAL EVENTS

WORLD Environment Day Celebration – 2025

On World Environment Day, celebrated on 5th June 2025, the Department of Computer Applications at Tula's Institute organized an awareness event focused on this year's global theme. The program emphasized the crucial role of youth in driving sustainable change and addressing environmental challenges such as pollution, deforestation, and climate change. The session included an insightful talk on practical solutions involving technology, innovation, and social responsibility. It concluded with an engaging student-led discussion and a collective pledge to adopt environmentally conscious practices, reinforcing the importance of active participation in building a greener future.

DEPARTMENTAL EVENTS

Guiding Lights Alumni Interaction 2024–2025 event

As part of the Guiding Lights Alumni Interaction 2024–2025, the Department aimed to provide students with a comprehensive understanding of key cyber security concepts, ethical hacking techniques, and defense mechanisms essential for protecting modern systems and networks. The session focused on bridging academic learning with industry practices, offering practical insights into identifying vulnerabilities through methods such as footprinting, scanning, and enumeration. By engaging with alumni who have real-world experience in cyber security, learners were equipped with both theoretical knowledge and hands-on approaches, encouraging them to explore ethical hacking as a responsible and in-demand career path.

Innovation & Research Synergy

Monika Kumari1, Jyoti Priya1, Richa Kumari1, Deepak Kumar Mahto1 and Aizaz Ahmad
1-PG Scholar, Department of Computer Applications, Tula's Institute, Dehradun
2-Assistant Professor ,Department of Computer Applications Tula's Institute Dehradun

This paper shows the complete attendance system we built utilizing modern web technologies. We integrated React and Material-UI for the UI, Node.js and Express for the backend, which handles administration as well as MongoDB for the datastore, and OpenCV and the face-recognition library for accurate face recognition. We deliver a contactless, remarkably reliable, and efficient attendance tracking system. The contactless attendance capturing and verification methodologies we developed smarten the process in educational and industrial setups. It enhances security and reduces the potential of human error.

It enhances security and reduces the potential of human error .Conventional attendance methods, like RFID card scanning or manual roll calls, are frequently laborious, prone tomistakes, and susceptible to fraudulent attendance. The development of computer vision and artificial intelligence hasmade face recognition technology a viable option for automating attendance systems. Without requiring physical contactor manual data entry, face recognition attendance systems recognize people based on distinctive facial features captured by a camera. To accurately detect and encode faces, we use OpenCV and the face-recognition Python library to
implement a full-stack face recognition attendance system. We oversee API requests and communicate with a MongoDB database that houses user and attendance data, with the backend created using Node.js and Express. React is used tobuild the frontend.
Manual attendance systems are ineffective and vulnerable to manipulation and human error. Biometric devices or RFID cards may malfunction, be misplaced, or be counterfeited. A contactless, precise, scalable attendance system that reduces human intervention and boosts data reliability is required. Problems with scalability and susceptibility to errors and manipulation make systems such as biometric and RFID tracking challenging.

Innovation & Research Synergy

Rakesh Kumar1; Dr. Rita Kumari Saini1 and Dr. Nishant Saxena
1-Department of Computer Science and Engineering, Sparsh Himalaya University Dehradun Uttarakhand, India
2-Co-Supervisor: Additional Director, Tula's Institute Dehradun Uttarakhand, India

This study investigates the use of various machine learning (ML) models to forecast early and late blight in potatoes, diseases that significantly reduce crop yield and quality. Using a dataset of over 4,000 weather condition records, key factors such as temperature, humidity, wind speed, and atmospheric pressure were analyzed using techniques like K-means clustering, PCA, and copula analysis. ML models applied included logistic regression, gradient boosting, MLP, SVM, and KNN—with and without feature selection. Feature selection, notably using binary Greylag Goose Optimization (bGGO), significantly improved model accuracy. The MLP model with feature selection achieved the highest accuracy at 98.3%, highlighting the value of optimized features. This approach offers a reliable tool for early disease detection, supporting sustainable farming and food security through automated and effective disease control.

This project explored using weather factors and various machine learning models to predict potato leaf diseases. Before feature selection, logistic regression (LR) and neural networks (MLP) achieved over 94% accuracy. Feature selection techniques, especially bGGO and bWWPA, improved all models by identifying key features and reducing errors. MLPperformed best, reaching 98.3% accuracy and efficient data reduction. The study highlights the importance of optimizing ML models for effective disease prediction, helping farmers make accurate, timely decisions to minimize crop losses.

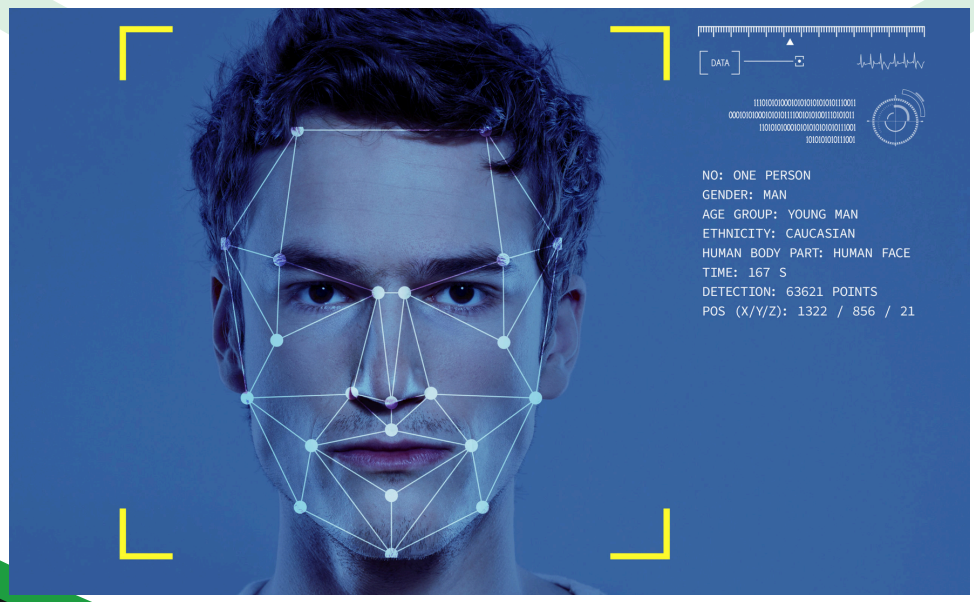
Future work should expand datasets to include more crops and diseases, apply advanced feature selection, and develop user-friendly management tools to support sustainable agriculture.

Innovation & Research Synergy

A. Gupta and P. Matta, "Automated Detection of Manipulated Images Using Deep Learning and Computer Vision Techniques," 2024 Eighth International Conference on Parallel, Distributed and Grid Computing (PDGC), Waknaghat, Solan, India, 2024, pp. 570-576, doi: 10.1109/PDGC64653.2024.10984289.
keywords: {Deep learning;Computer vision;Visualization;Accuracy;Computational modeling;Splicing;Computer architecture;Data augmentation;Robustness;Convolutional neural networks;Image Manipulation;Computer Vision;Convolutional Neural Networks;Deep Learning;Forgery Detection;Copy-Move Detection;Splicing;Inpainting},

In the current era, where image manipulation techniques have developed at a faster pace, detection of altered images using the conventional methods has become increasingly challenging. This article presents a framework for automatically detecting the altered images using deep learning and computer vision techniques. The system focuses on providing methods to detect various image manipulations such as copy-move, inpainting and image-slicing. With the help of integrating convolutional neural networks (CNN) with anomaly detection methods and image preprocessing, the proposed framework can successfully find visual image anomalies that show potential image manipulation. The experiment conducted shows that the framework could effectively detect image alterations using the state-of-the-art computer vision and deep learning algorithms.

With the rise in the use of technology, the tapering of images digitally, which is also known as image forgery, goes undetectable with naked eyes. These tapered or altered images are the major reason for the spread of fake news on various social media platforms such as Facebook, Instagram or Twitter. The software which helps in creating these fake images are freely available on internet such as GNU or Adobe Photoshoot, posing a significant challenge on when comes to verification of the authenticity of the visual content. The spectrum of this phenomenon is very wide with implications across different fields such as, journalism, where integrity of the news is at stake, forensics, where the judgement can be made based on some evidence or misleading visuals, and social media, where fake images can spread misinformation at a very fast pace . Moreover, AI-based image generation like deepfakes have made it even more easier to create fake images which are non-detectable for human eyes. As a result, there is a need to automate systems capable of detecting the forgery in order to maintain the integrity of the information and public trust.



Innovation & Research Synergy

Atika Gupta, Priya Matta, Bhasker Pant, Analyzing the social conduct of users to detect and prevent cybercrime across social networks, Procedia Computer Science, Volume 258, 2025, Pages 4269-4278, ISSN 1877-0509, https://doi.org/10.1016/j.procs.2025.04.676.https://www.sciencedirect.com/science/article/pii/S1877050925017806)

The online social network features have made it possible to reach cybercriminals in previously unreachable countries and locations. Machine Learning techniques allow us to predict and detect harmful forms of human behaviour such as cyberbullying. Cyberbullying can be easily committed; it is fast-spreading and dangerous, aggressive behaviour. The criminal only requires a laptop and an internet connection and no confrontation with the victim. Anonymous users on social media websites are also the primary cause of aggressive behaviour. Big-data analysis unfolds the otherwise hidden information through deep learning and can help forecast the future when combined with machine learning techniques. The rise of cybercrime poses a significant threat to individual users and the community. For that, effective mitigation techniques are urgently required. This study proposes an innovative model IdentityLinkerNet (ILN) designed to detect cybercriminals by analyzing the social conduct of users across social networks. There are some ethical concerns regarding this study which are privacy concerns related to data collection and sharing, consent and data security. The limitation of this study lies in collecting datasets for user behaviour analysis across multiple social media platforms.

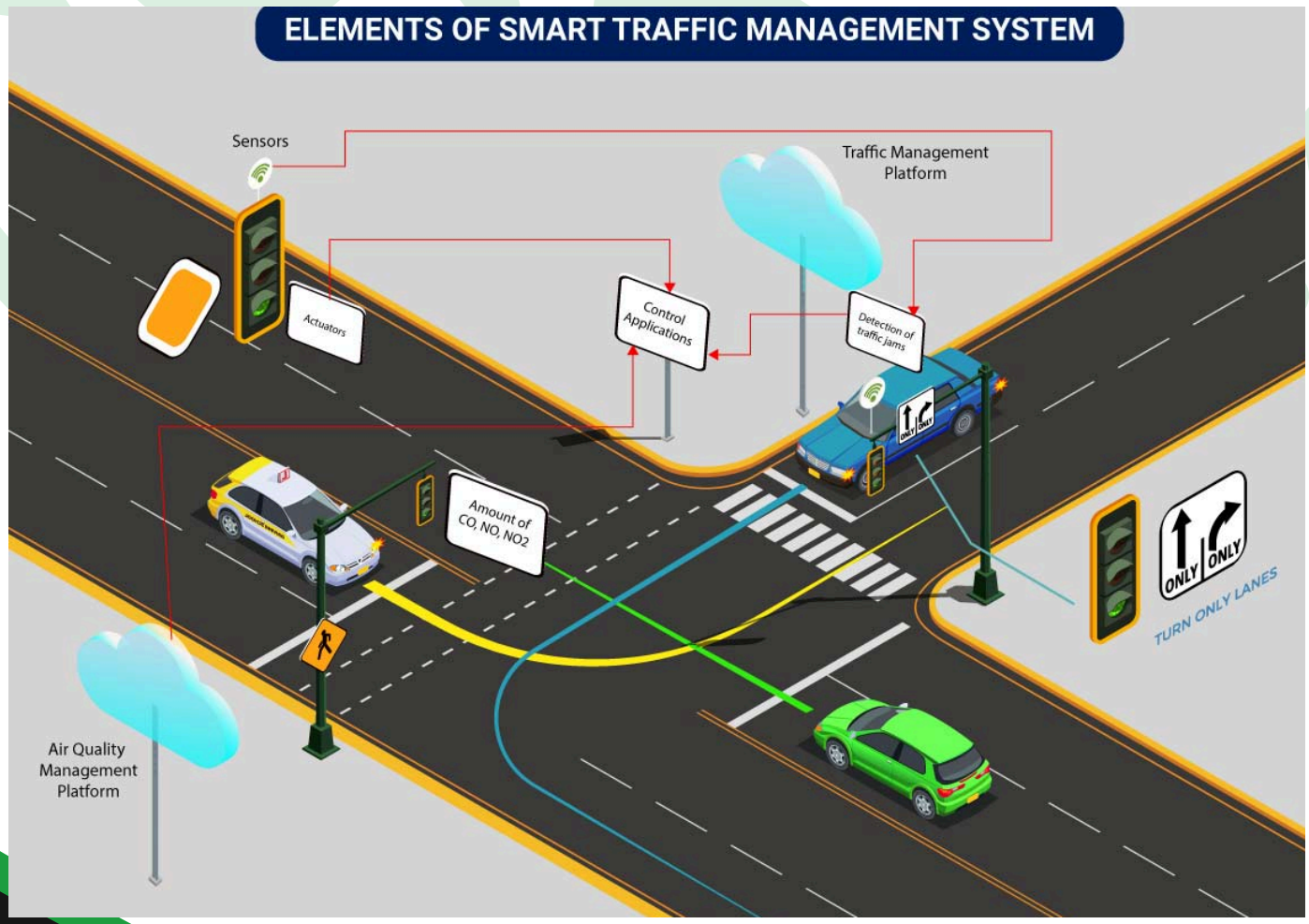
hese platforms can sometimes be emotional or with an individual or a group with whom the meeting otherwise would not have been possible. These social media sites are large real-time data repositories as users create their profiles and communicate with others despite their geographic locations. According to (M. Agrawal et al.) , (Al-Ajlan et al.) , though these sites hold usefulness, they have gained popularity with an increasing number of cybercrimes.

Innovation & Research Synergy

Intelligent Traffic Management Systems: A Modern Computational Approach to Urban Congestion Meenakshi Pandey1, Priyanka Kumari1, Bhaskar1, Dr. Tripuresh Joshi2, Neem Sagar3 and Dr. Sanjeev Kumar

A continuous and fast rise in vehicles in cities and suburbs has led to major problems for current transportation and traffic systems. Current methods of traffic control, including fixed timers, supervisors, and basic cameras, are not sufficient to effectively handle vehicular traffic, reduce congestion, and ensure public safety. The system employs advanced technologies such as IoT (Internet of Things), AI (Artificial Intelligence), computer vision, and big data analytics to support traffic monitoring, dynamic traffic sign control, real-time predictions, and smart routing. By incorporating these innovations, ITMS benefits traffic flow, lowers pollution, saves fuel, and reduces accidents on highways and major roads. Secondly, the paper explores the architecture of ITMS and shares actual examples from different regions. It also examines important challenges such as data privacy, the integration of combined technology systems, and managing costs. Finally, the paper offers proposals to improve the future stability and efficiency of urban traffic systems.

During this century, cities and metropolitan areas worldwide have experienced significant population growth due to increased urbanization. With more people moving to cities in search of better employment, education, healthcare, and living conditions, transportation has become increasingly vital. The rise in both private and commercial vehicles has put immense pressure on our road networks, traffic intersections, and signaling systems.



Emerging Talent

माँ

Syed Ayed Hussain
Department of Computer Application
Student

माँ तेरी ममता से बढ़कर कुछ भी नहीं,
तेरे बिना ये ज़िंदगी अधूरी सी सही।

तेरे हाथों की दुआएं मेरे साथ रहती हैं,
तेरी मुस्कान में मेरी दुनिया बसती है।

थक जाऊँ जब दुनिया के सफ़र में कहीं,
तेरा चेहरा देखकर सुकून मिल जाता यहीं।

तेरी गोद से बढ़कर कोई जन्नत नहीं,
तेरे बिना कोई भी ख़ुशी मुकम्मल नहीं।

माँ तू है तो हर दर्द आसान लगता है,
तेरे बिना दिल बहुत वीरान लगता है।

माँ तेरे साए में खुदा भी करीब लगता है,
तेरा बेटा होना ही खुश नसीब लगता है।

Emerging Talent

शिक्षा

Anjali Sharma
Department of Computer Application
Student

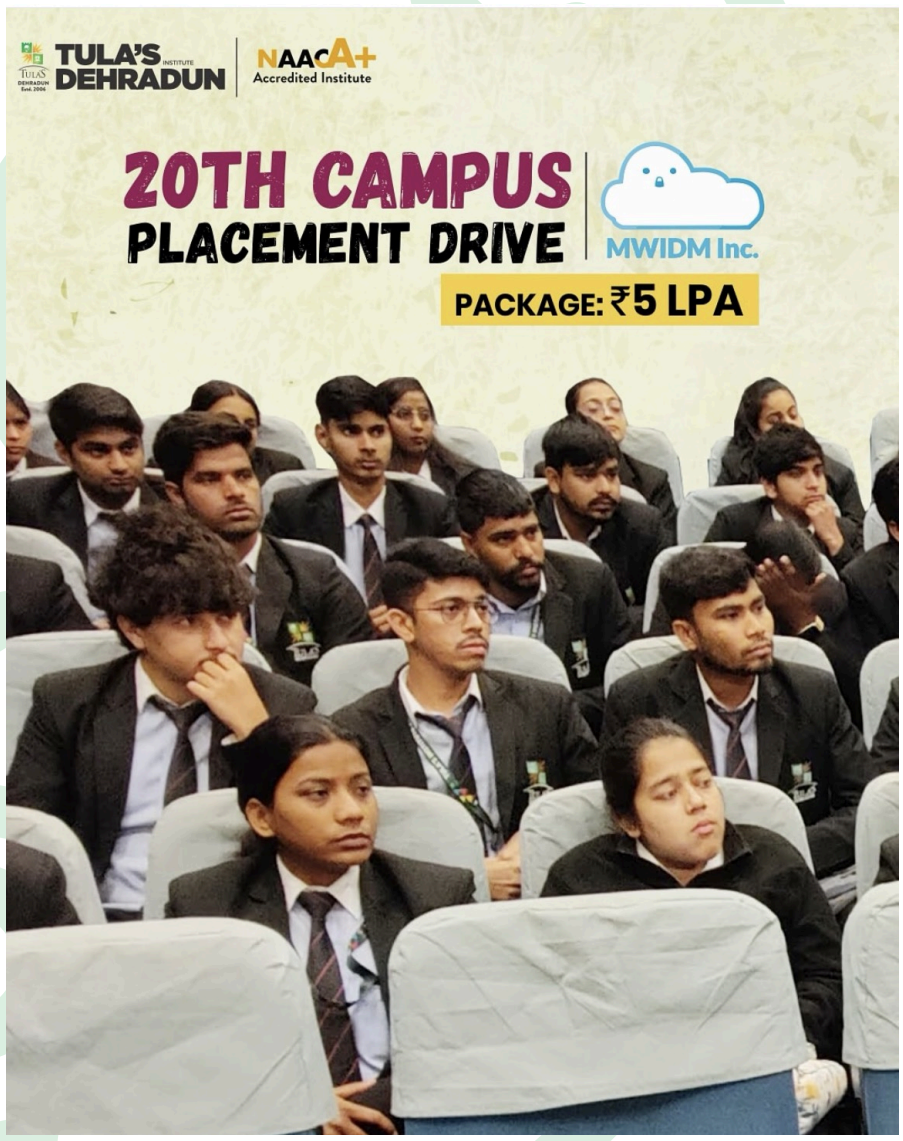
शिक्षा सबका है अधिकार, यह है जीवन का श्रृंगार।।
शिक्षा करती है, मन को पुलकित,
इसको पाकर, जीवन हो जाता हर्षित।।

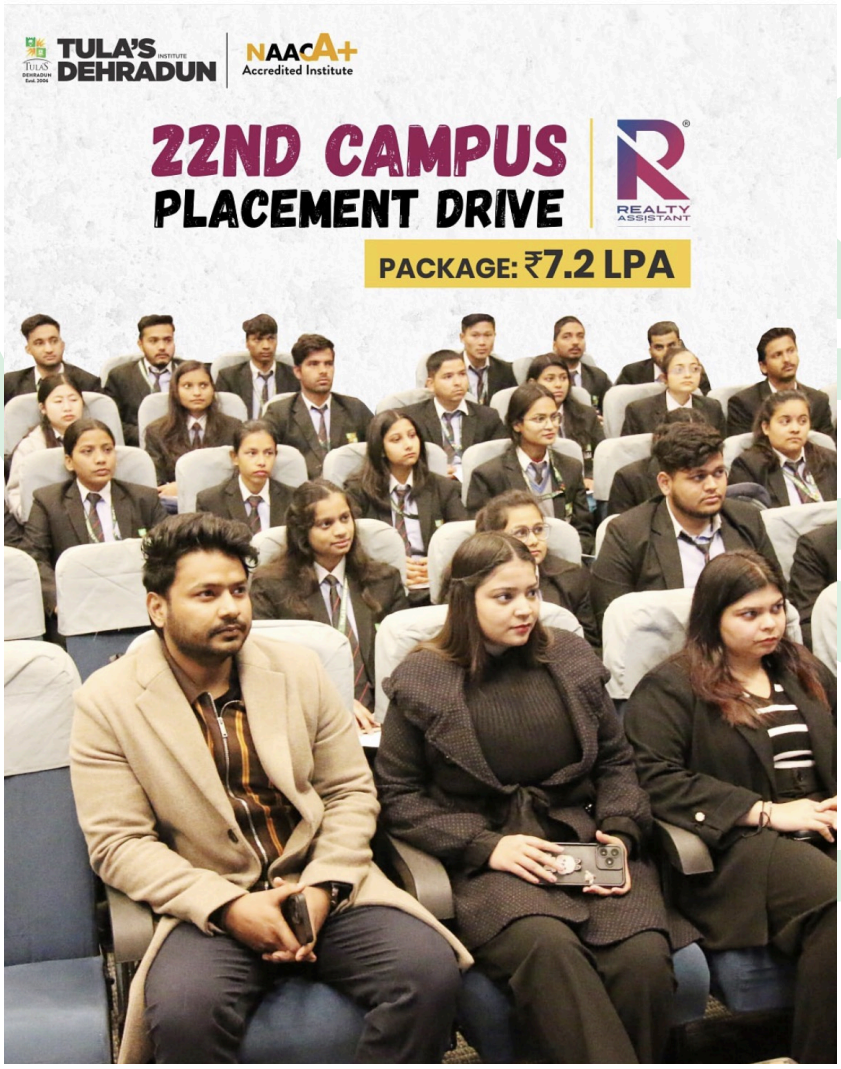
यह विद्यार्थी जीवन होगा सफल,
करो शिक्षा का जीवन में सृजन।।
उठो जागो हे! शिक्षा की सृजनहारो,
वीर बनो, और शिक्षा का सम्मान करो।।

ज्ञान की रोशनी फैलाओ दूर-दूर तक,
अंधकार मिटाओ, हर दिल के सुर तक।।
शिक्षा से ही बढ़ेगा संस्कार,
यही है प्रगति का सच्चा आधार।।

शिक्षा से सजता है जीवन का हर रंग,
यही है खुशियों का सबसे मधुर संग।।
मिलकर करें हम सब ये प्रण,
शिक्षा से रोशन हो हर जन-जन।।

Placement Drives





Achievers


TULA'S INSTITUTE DEHRADUN
NAAC A+ Accredited Institute
NBA B.TECH CSE | 2024-2027
Relinns Technologies
CONGRATULATIONS
Dheeraj Kumar
MCA
₹3 LPA
PACKAGE


TULA'S INSTITUTE DEHRADUN
NBA
NAAC A+
LEARNING ROUTES
Priyanka Kumari - MCA
₹6.06 LPA
PACKAGE

Future Announcements

Future Announcements