STRATEGIC PLAN 2026-2031

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

FACULTY OF ENGINEERING AND TECHNOLOGY
RAMA UNIVERSITY, UTTAR PRADESH, KANPUR

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SECTION-I

KEY POLICY RECOMMENDATIONS AND INTERVENTIONS

With a renewed commitment to academic excellence and innovation, the Department of Computer Science & Engineering (CSE), Rama University, Kanpur, has embarked on an ambitious and transformative five-year Strategic Plan (2026 to 2031). This roadmap is aligned with NAAC and UGC directives, placing the Internal Quality Assurance Cell (IQAC) at the forefront of planning, guiding, and monitoring all Quality Assurance (QA) and Quality Enhancement (QE) initiatives.

This new phase of strategic development is energized by the introduction of the R-25 curriculum, a forward-thinking academic framework approved by the Board of Studies (BOS) in 2025–26. Designed to bridge the gap between academia and industry, R-25 integrates several cutting-edge, industry-oriented courses across all programs to ensure our graduates remain a step ahead in the competitive tech landscape. These curriculum reforms are geared to strengthen applied learning, project-based development, and prepare students for dynamic roles in fields such as AI, cybersecurity, blockchain, IoT, cloud, and full-stack development.
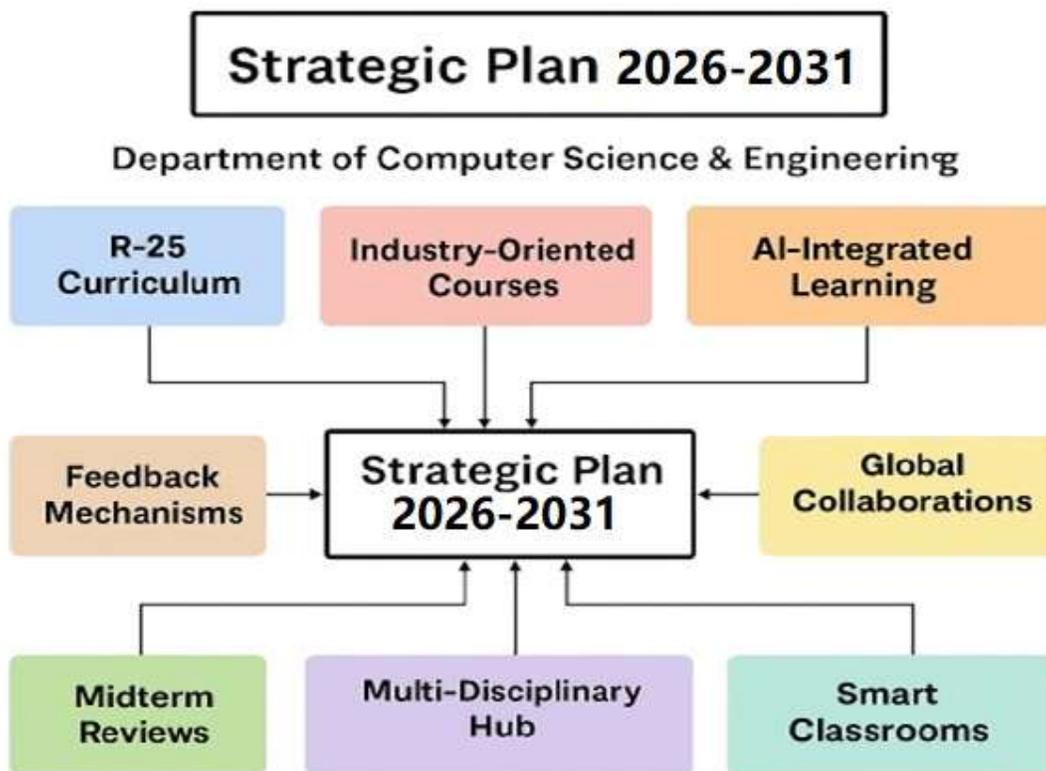
The formulation of this Strategic Plan has been highly inclusive. Inputs were gathered from a wide spectrum of stakeholders — university leadership, faculty, students, alumni, industry partners, and peer institutions. Guided by their expectations, along with evolving national policies, institutional vision-mission, and technological trends, the IQAC has crafted a roadmap aimed at academic excellence, research vibrancy, innovation, and global readiness.

The IQAC has prioritized several initiatives in this plan:

- Enhanced feedback mechanisms and continuous curriculum review
- Faculty empowerment through structured self-appraisal and research incentives
- Job satisfaction through recognition, training, and academic freedom
- Establishment of a dedicated Departmental Research & Innovation Committee

To ensure agility and responsiveness, midterm reviews are scheduled at the close of 2025–26 and 2026–27, enabling timely reflection and course correction. These checkpoints will allow the department to evaluate its progress, re-calibrate its action plan, and double down on emerging opportunities.

Looking forward, the department envisions the creation of AI-integrated smart classrooms, deployment of Learning Analytics for personalized student development, and global academic collaborations with top institutions. Plans are underway to establish a multi-disciplinary innovation and incubation hub, empowering students to transform research into real-world solutions. Faculty exchange programs, sabbaticals in industry, and international dual-degree pathways will be promoted to position the department on a global pedestal. In addition, green computing and ethical tech development will be made core components of the academic culture, making the department a leader not just in technological competence but in sustainable and socially responsible innovation.

Strategic Plan 2026-2031

Department of Computer Science & Engineering

R-25 Curriculum · Industry-Oriented Courses · AI-Integrated Learning · Feedback Mechanisms · Strategic Plan 2026-2031 · Global Collaborations · Midterm Reviews · Multi-Disciplinary Hub · Smart Classrooms

1.1 VISION

To be recognized for academic excellence in the field of education and research and to make a recognizable contribution to the engineering community by our research centres, competency, and proficiency.

1.2 MISSION

- To grant excellent expert preparation at the postgraduate and undergrad level with an accentuation on essential standards of software engineering and designing.
- To build up broadly and globally perceived exploration habitats and open the understudies to wide research insight.
- To confer good and moral qualities and relational abilities to the understudies.
- To enable the understudies with the necessary abilities to take care of the complex innovative issues of current culture and furthermore give them a structure for advancing community and multidisciplinary exercises.

   @CORE VALUES

   Excellence, Innovation, Integrity, Leadership, Professionalism

1.3 OBJECTIVES

- Equip students with strong theoretical foundations and practical skills.
- Promote research and innovation in Artificial Intelligence, Cybersecurity, IoT, Cloud Computing, and Data Science.
- Encourage students to pursue higher education and competitive careers.
- Foster responsible and ethical computing practices.
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1.4 ACTION PLAN

- Update curriculum in line with NEP 2020 and industry demands.
- Encourage inquiry-based and project-based learning in labs.
- Promote inter-departmental and cross-institutional research.
- Strengthen industry-institute interaction via MoUs and internships.
- Improve infrastructure for emerging areas like AI, Blockchain, and Quantum Computing.

1.5 RESEARCH DEVELOPMENT STRATEGY

- Establish dedicated research labs and secure funding through AICTE, DST, and UGC.
- Focus on interdisciplinary research: AI + Healthcare, IoT + Smart Cities, etc.
- Motivate faculty to publish in high-impact journals and file patents.
- Integrate undergraduate students into research projects.

1.6 CENTRE OF EXCELLENCE IN COMPUTING RESEARCH & TRAINING (CECRT)

- Setup a Centre focused on research and training in cutting-edge areas such as:
- Artificial Intelligence & Machine Learning
- Cybersecurity and Blockchain
- Cloud and Edge Computing
- Advanced Algorithms and Software Systems
- Organize workshops, training programs, and expert lectures with industry and research bodies like DRDO, ISRO, TCS, Infosys.

1.7 ADMISSION STRATEGY

- Outreach to schools and +2 students through coding camps and tech fests.
- Publicity of academic and placement achievements on digital platforms.
- Organize seminars and demos showcasing CSE labs and student innovations.

1.8 PLACEMENT STRATEGY

- Tie-ups with IT firms and startups for internship and placement drives.
- Train students on certifications like AWS, Cisco, Microsoft, Google Cloud.
- Offer pre-placement training including aptitude, communication, and technical tests.

1.9 SOCIETAL BENEFIT

- Encourage projects aligned with social impact: smart villages, health apps, e-governance tools.
- Promote participation in hackathons and open-source contributions for community development.

SECTION-II

STRATEGIC FOCUS AREAS

The Department of Computer Science & Engineering (CSE) at Rama University offers a range of undergraduate and postgraduate programs aimed at preparing students for leadership roles in the evolving world of technology. At the undergraduate level, the department offers Bachelor of Technology (B.Tech) with specializations in Artificial Intelligence, Data Science, Cyber Security, Cloud Computing, and Internet of Things (IoT), along with Bachelor of Computer Applications (BCA). At the postgraduate level, the department offers Master of Computer Applications (MCA), Master of Technology (M.Tech), and M.Tech (Part-Time) to support both full-time learners and working professionals seeking advanced technical qualifications.

The department is committed to producing highly skilled, innovative, and ethically grounded computing professionals. It integrates research and teaching to harness students' full potential and has established itself as a center of excellence in computer science education. The dynamic curriculum focuses on both foundational knowledge and industry-driven specializations, equipping students with the skills needed for research, employment, entrepreneurship, and lifelong learning.

With state-of-the-art laboratories, modern computing infrastructure, and a team of dedicated faculty, the department offers hands-on exposure to real-world challenges. Over the next five years, the department will focus strategically on five core domains: Artificial Intelligence & Data Science, Cyber Security & Blockchain, Cloud & Edge Computing, IoT & Embedded Systems, and Quantum & High-Performance Computing, ensuring its graduates are future-ready and globally competent.

2.1 ARTIFICIAL INTELLIGENCE & DATA SCIENCE

The exponential growth of data and intelligent systems necessitates a strong foundation in AI and data science. These areas are now core to every industry—from healthcare and agriculture to finance and logistics. The department will introduce specialized electives, hands-on labs with Python, TensorFlow, and Scikit-learn, and promote interdisciplinary projects with other departments to ensure students master applied AI. Faculty will also be encouraged to undertake sponsored AI research projects and publish in reputed journals.

2.2 CYBERSECURITY & BLOCKCHAIN

With increasing cyber threats, cybersecurity is no longer optional. Similarly, blockchain technology is transforming secure digital transactions. The department will establish **a** Cybersecurity Lab, offer certifications in ethical hacking, and launch blockchain development modules in collaboration with industry partners. Workshops and simulation environments will prepare students for national/international cyber challenges.

2.3 CLOUD & EDGE COMPUTING

Modern computing relies heavily on cloud infrastructure and decentralized edge systems for real-time processing. To support this, the department will set up virtualized lab environments using platforms like AWS Educate and Microsoft Azure. Cloud architecture and deployment, containerization (Docker, Kubernetes), and serverless models will be embedded into UG and PG courses.

2.4 INTERNET OF THINGS (IOT) & EMBEDDED SYSTEMS

IoT is pivotal to smart cities, homes, and industries. The department will integrate IoT kits (e.g., Arduino, Raspberry Pi), sensor programming, and data analytics into project-based learning. Collaborative projects with civil, mechanical, and electrical engineering departments will enable the development of smart prototypes.

2.5 QUANTUM COMPUTING & HIGH-PERFORMANCE COMPUTING

Quantum computing is redefining problem-solving in cryptography, optimization, and simulation. HPC supports research in large-scale analytics and modeling. The department will introduce foundational courses in quantum logic and programming (using simulators like IBM Qiskit) and provide cloud access to quantum labs for hands-on experimentation.

2.6 INTELLECTUAL PROPERTY & TECHNOLOGY COMMERCIALIZATION

To create innovation with impact, students and faculty need awareness of IP protection and technology transfer. IPR and patenting will be introduced as part of the curriculum. The department will conduct awareness drives, workshops in collaboration with IPR Cell, and provide mentorship for patent drafting, filing, and licensing processes.

2.7 e-GOVERNANCE & SMART SYSTEMS

Digitizing governance improves transparency and service delivery. Students will be encouraged to design e-Governance applications using open-source stacks. Real-world projects like grievance portals, digital ID verifications, and GIS-based utilities will be developed in association with local civic bodies.

2.8 INDUSTRY 4.0 & AUTOMATION

To prepare students for future-ready manufacturing and production systems, Industry 4.0 concepts like robotics, AI-enabled automation, and digital twins will be introduced. The department will establish collaborations with industries and set up a pilot automation cell for simulation-based learning.

The Department of Computer Science & Engineering is proactively preparing to meet the forthcoming challenges of the ever-evolving global tech landscape. As computing technologies continue to reshape industries and societies, we are committed to equipping our students with cutting-edge skills, futuristic mindsets, and research-oriented perspectives. We are integrating advancements such as into our curriculum and research focus to align with global innovation trajectories Generative Artificial Intelligence**,** Robotics**,** Quantum Computing**, and** Human-Computer Interaction. With the exponential rise of tools like ChatGPT, DALL·E, autonomous systems, and collaborative robots (cobots), we recognize the urgent need to develop professionals who can both build and responsibly manage these transformative technologies. Our programs emphasize interdisciplinary learning, ethical computing, and global readiness—enabling students to work on projects that incorporate machine creativity, natural language processing, autonomous decision-making, and intelligent automation. The department is also fostering collaborations with international institutions and industries to bring in world-class exposure in Augmented Reality**,** Metaverse applications, and Next-Gen computing architectures**.** Through our updated curriculum, advanced labs, and innovation ecosystems, we aim to not just follow global trends, but lead the way in solving the technological challenges of tomorrow—preparing graduates who are ready to shape the future, not just fit into it.

To realize its vision of becoming a future-ready academic hub, the Department of Computer Science & Engineering (CSE) at Rama University is undertaking a series of well-defined strategic actions that align with upcoming global technological advancements. Recognizing the growing influence of Generative AI, Robotics, Quantum Computing, and Emerging Digital Ecosystems, the department is actively redesigning its academic structure, infrastructure, and collaborative networks to ensure graduates are equipped for the next decade of computing innovations.

One of the core actions is the integration of R-25, a newly introduced curriculum framework that emphasizes industry-oriented, project-based, and interdisciplinary learning. It includes specialized electives in AI-driven automation, robotic control systems, natural language generation, and ethics in AI, ensuring students gain relevant, future-centric expertise. The department is establishing dedicated AI & Robotics Research Labs with simulation platforms like ROS (Robot Operating System), OpenAI Gym, and NVIDIA Jetson kits to facilitate hands-on innovation.

SECTION III

STRATEGIC PLANNING GOALS

The department has identified key goals for the five-year period:

3.1 GOAL 1: QUALITY RESEARCH & CONSULTANCY

Strategies:

- Establish 3 Centers of Excellence by 2031.
- Attain 100% faculty with PhD qualification.
- Ensure 2+ publications per faculty annually in reputed journals.
- Increase patents filed per faculty per year (target: 3).
- Generate external research funding (target ₹60+ lakhs by 2031).
- Support start-up incubation (target: 3 start-ups).

Actions:

- Upgrade labs with support from AICTE, DST, etc.
- Restructure faculty workload to enhance research productivity.
- Organize an annual *Open Day* to showcase research and attract collaborators.

Metric	2026	2028	2031
Centers of Excellence	1	2	3
PhD Faculty	50%	70%	100%
Research Publications (per faculty/year)	2	2	2
Patents (per faculty/year)	1	2	3
Industry Grants (₹ Lakh)	10	30	60
Startups Incubated	1	2	3
% of research publications through international collaborations	5%	10%	20%

Strategic Plan Metrics Growth (2026–2031)
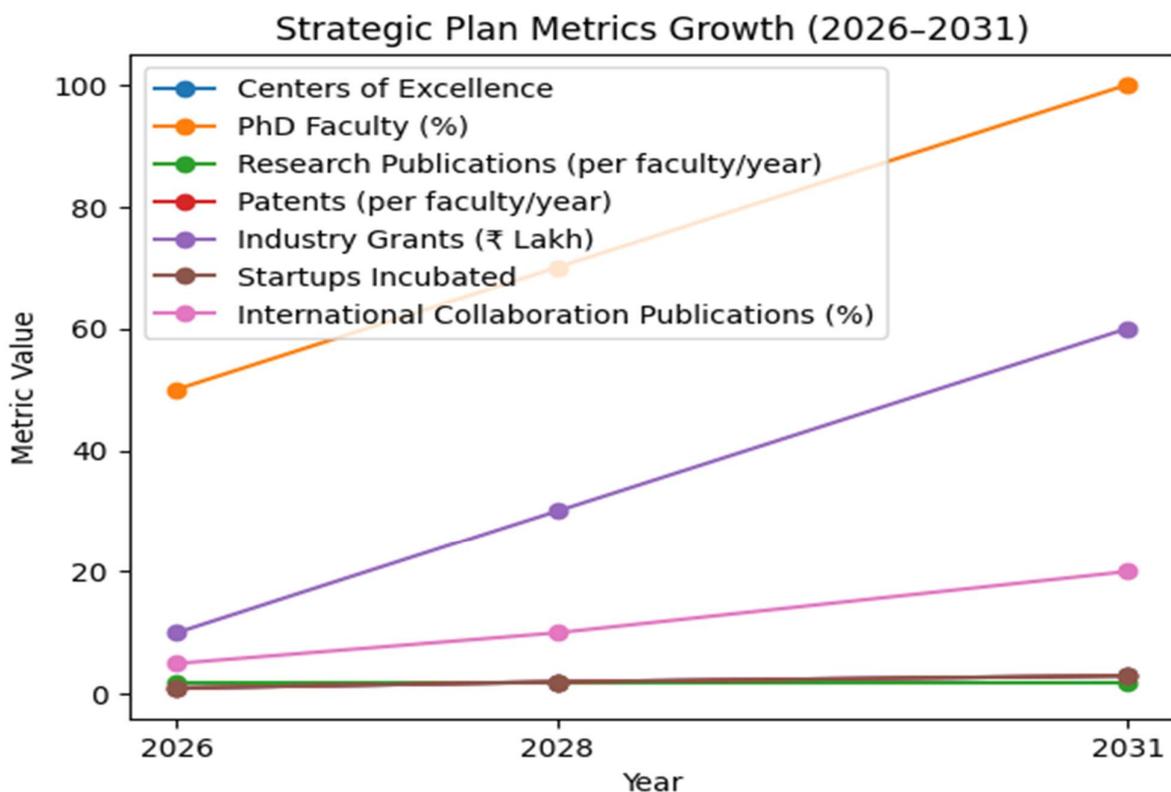
3.2 GOAL 2: QUALITY TEACHING

Strategies:

- Establish a Teaching-Learning Cell for innovation and mentorship.
- Launch virtual labs and e-content repository (*ePrayogshala*).
- Align teaching with industry needs through certifications and value-added courses.

Actions:

- Introduce mini-projects and MOOCs.
- Include student feedback in teaching evaluation.
- Regular faculty development programs on pedagogy and curriculum design.

3.3 GOAL 3: STUDENT SATISFACTION AND SUCCESS

Strategies:

- Improve communication and coding skills across all programs.
- Promote individual mentoring, especially for weak performers.

- Enable students to participate in national competitions and industry hackathons.

Actions:

- Set up *Skill & Career Development Cell* to guide on jobs, GATE, GRE, etc.
- Establish *Entrepreneurship & Innovation Cell*.
- Track success through placement records, start-ups, patents, and social impact.