SDG 9: Industry, Innovation and Infrastructure

Report 2023-24

9.1.1 Industry, Innovation and Infrastructure: Publications

K.R. Mangalam University demonstrates a strong commitment to advancing industry, innovation, and infrastructure through impactful and high-quality research. Over the past five years (2020–2024), the University has published 942 research papers, of which 334 involved international collaborations reflecting its dedication to global academic engagement and innovation-driven inquiry. Among these, 197 publications are directly aligned with the United Nations Sustainable Development Goals, focusing on themes such as clean energy, sustainable infrastructure, digital transformation, and industrial innovation.

In 2024 alone, the University achieved remarkable progress with 162 internationally co-authored publications, including 113 specifically addressing SDG-related issues such as sustainable cities, responsible consumption, quality education, and technological innovation. These research collaborations with reputed global institutions foster the exchange of ideas, technologies, and best practices that contribute to resilient industrial growth and sustainable infrastructure.

Through interdisciplinary research centres, incubation hubs, and innovation-led teaching practices, K.R. Mangalam University continues to bridge academia and industry. Its research outcomes under SDG 9 reflect the University's mission to promote sustainable industrialization, innovation ecosystems, and infrastructure development aligned with national priorities and global sustainability frameworks.

9.2.1 Number of patents citing research

K.R. Mangalam University demonstrates consistent progress in innovation and intellectual property creation, reflecting the growing relevance of its research to industry and society. Between 2019 and September 2025, the University achieved a total of 349 intellectual property

outputs, including 198 published patents, 112 design registrations, 34 awarded patents, and 5 copyrights.

The year 2024 marked a major leap, recording 109 patent activities, the highest single-year output. This includes 52 published patents and 50 design patents, indicating robust engagement of faculty and students in applied and industrially relevant research. The surge in patenting activity during 2024 correlates with expanded collaborations with technology-driven enterprises and increased funding for innovation under institutional research grants.

These patents are increasingly being cited by external inventors and organizations, underscoring the translational value of K R Mangalam University research in fields such as clean energy, healthcare technology, materials engineering, and sustainable infrastructure.

9.3.1 – Number of University Spin-offs

K.R. Mangalam University encourages innovation and entrepreneurship by incubating academics research into viable business solutions. In the 2024 reference year, The University does not have any new registered spin-off companies; however, it still reaps the rewards of successful previous ones and overall has a strong innovative culture as well as an effective partnership with industry.

Earlier, K.R. Mangalam University nurtured the efforts of innovators who created some spin-offs definitely still active and in action to maintain India's start-up ecosystem. These include Arivation Fashiontech Private Limited (2018) in the area of fashion technology and sustainable design solutions; Royal Guild Financial Services Private Limited (2021) operational in digital finance and financial inclusion; Innovationsatss Private Limited (2022) working for applied research and product innovation, as well as other companies such as Rentia Space Private Limited, Ambuquick Healthcare Private Limited and Ramrupee World Private Limited. Such initiatives display K.R. Mangalam University's adherence to promoting an entrepreneurial gestalt, intellectual property generation and enduring industry linkages pan India. The University further develops its Innovation and Incubation Centre to provide a fertile ground for upcoming spin-offs in line with SDG 9 Industry, Innovation and Infrastructure.

AMBUQUICK HEALTHCARE PRIVATE LIMITED --- Click Here
ARIVATION FASHIONTECH PRIVATE LIMITED --- Click Here
Innovationsatss Private Limited --- Click Here
RAMRUPEE WORLD PRIVATE LIMITED --- Click Here
RENTIA SPACE PRIVATE LIMITED --- Click Here
ROYAL GUILD FINANCIAL SERVICES PRIVATE LIMITED --- Click Here

9.4.1 – Research Income from Industry and Commerce per Academic Staff

K.R. Mangalam University is deeply committed to collaborating on research with industry, government and the community sector. The University undertook 12 externally funded projects during the year 2023-24 funded by different NGOs / government agencies to indicate its increasing participation in applied and socially relevant research. The overall research income earned by the faculty members from these projects was to the tune of ₹ 4,81,50,000 which testified UTF's capacity in tapping competitive funds and translating academic expertise into productive realizations.

- Total Research Income from Industry and Commerce (2024): ₹ 4,81,50,000
- Total Number of Academic Staff: 332
- Research Income per Academic Staff: ₹ 145030

These projects would encompass applicability across a wide range of fields in the IITM and include Science, Technology & Management, Social Sciences & Humanities promoting multidisciplinary innovation towards real-world problem-solving. The significant role of the University's full-time academic staff in implementing these initiatives forged closer relationships between academia, industry and the broader community. It has always been the commitment of K.R. Mangalam University to inculcate a culture where innovation and empirical development is celebrated, generating value for society and fostering sustainable growth through sustained partnership, participation and sharing of research.

K.R. Mangalam University is committed to promoting research excellence and building industry–academia collaboration through a range of structured faculty development programmes, workshops and conferences for the past few years. In 2023–24, the University

conducted several capacity-building activities in collaboration with renowned partners which included the ICT Academy, Computer Society of India and Amazon Web Services (AWS). The advanced skills of cloud computing (AWS Cloud Practitioner FDP, Azure DevDay– Cloud Native Tour), artificial intelligence (Generative AI in Teaching, Learning and Research Workshop), research design (Workshop on Scientific Writing using LaTeX) and academic writing acquired were key attributes.

Following which MRIE-2023 and Summer Internship Programme at NIT Hamirpur played a crucial part in practical learning experience while involving the research component between academics and industry support, where knowledge is taught and learned back. These initiatives cumulatively led to increased research productivity, digital innovation and skill diversification of both staff and students – all critical enablers for 9.4.1 on Research income, Industry collaboration. It is in the pursuit of these sustained efforts, K.R. Mangalam University is further steered to building a Research ecosystem that fosters innovation and integrates education, technology and sustainable industrial development.

List of Activities:

Title of the Activity	Nature of the Activity	Date of Activity	School	Link
AWS (CLOUD PRACTITIONER)"- By Ms. Kamatchi Devi, AWS Solutions – In Collaboration with ICT Academy	**FDP**	30 Jan 2023 to 3 Feb 2023		AWS CLOUD PRACTITIONER
International Conference on Multidisciplinary Research and Innovations in Engineering (MRIE-2023)	International Conference	28th July 2023 – 29th July 2023		International Conference on Multidisciplinary Research
Hackathon: Hack K R Mangalam University 3.0	Competation	5th to 7th March 2024		Hackathon Hack KRMU 3.0
AzureDevDay-Cloud Native Tour : "Building Cloud Native Application with Bellerina and	Workshop	21-Feb-24		AzureDevDay Cloud Native Tour

Choreo-Workshop" in collaboration with Computer Society of India				
Power Seminar on AI & Cloud Computing in collaboration with ICT Academy	Seminar	5th April 2024		Power Seminar on AI & Cloud
Research and Methodology	Workshop	18th July 2022		Research and Methodology
Generative AI Teaching Learning Processes and Research	Workshop	09th June 2023		Generative AI Teaching Learning Processes and Research
Workshop on Scientific Writing Using LATEX	Workshop	27th April 2024		Workshop on Scientific Writing Using Latex
Empowering Research Excellence: Tools for Effective Scientific Writing	Workshop	*11 May 2024*		Empowering Research Excellence
Summer Internships at NIT Hamirpur	Internships	July 2024-August 2024		Summer Internship at NIT

Faculty Development Programs - "AWS (CLOUD PRACTITIONER in Collaboration with ICT Academy

The **Faculty Development Programme (FDP) on AWS Cloud Practitioner**, conducted from **30th January to 3rd February 2023**, was organized by **K.R. Mangalam University** in collaboration with **ICT Academy**, under the coordination of **Dr. Shweta Bansal**. The resource person, **Ms. Kamatchi Devi**, AWS Solutions Architect, led an intensive five-day training focused on foundational and practical aspects of **Amazon Web Services (AWS)** cloud technologies. The FDP aimed to enhance faculty competence in cloud computing, enabling effective integration of AWS-based concepts into teaching and curriculum design.

The program structure combined **interactive lectures, guided labs, and certification preparation**, covering modules such as cloud fundamentals, service models, security, billing, and compliance. Faculty participants gained hands-on experience in deploying and managing cloud services, including EC2, S3, IAM, and Lambda. The sessions emphasized innovation-driven learning, application-based understanding, and upskilling for mentoring students in emerging technology domains. The FDP significantly improved participants' technical proficiency and pedagogical readiness in cloud computing. It also facilitated the inclusion of AWS-related projects and assignments in academic programs. Overall, the program successfully fostered an ecosystem of **continuous professional development, innovation, and research excellence** in cloud technologies.

Ms. Kamatchi Devi, AWS Solutions Architect, introducing participants to AWS Cloud Practitioner fundamentals during the FDP session.

International Conference on Multidisciplinary Research and Innovations in Engineering (MRIE-2023)

The **International Conference on Multidisciplinary Research and Innovations in Engineering (MRIE-2023),** held from **28–29 July 2023** at **K.R. Mangalam University**, served as a dynamic platform for global researchers, academicians, and professionals to exchange ideas and present technological advancements across diverse engineering disciplines. Coordinated by **Dr. Shweta Bansal** and **Dr. Vineet Dahiya**, the two-day event featured **keynote addresses, paper presentations, panel discussions**, and **interactive workshops**. Eminent speakers delivered insightful lectures on emerging trends such as

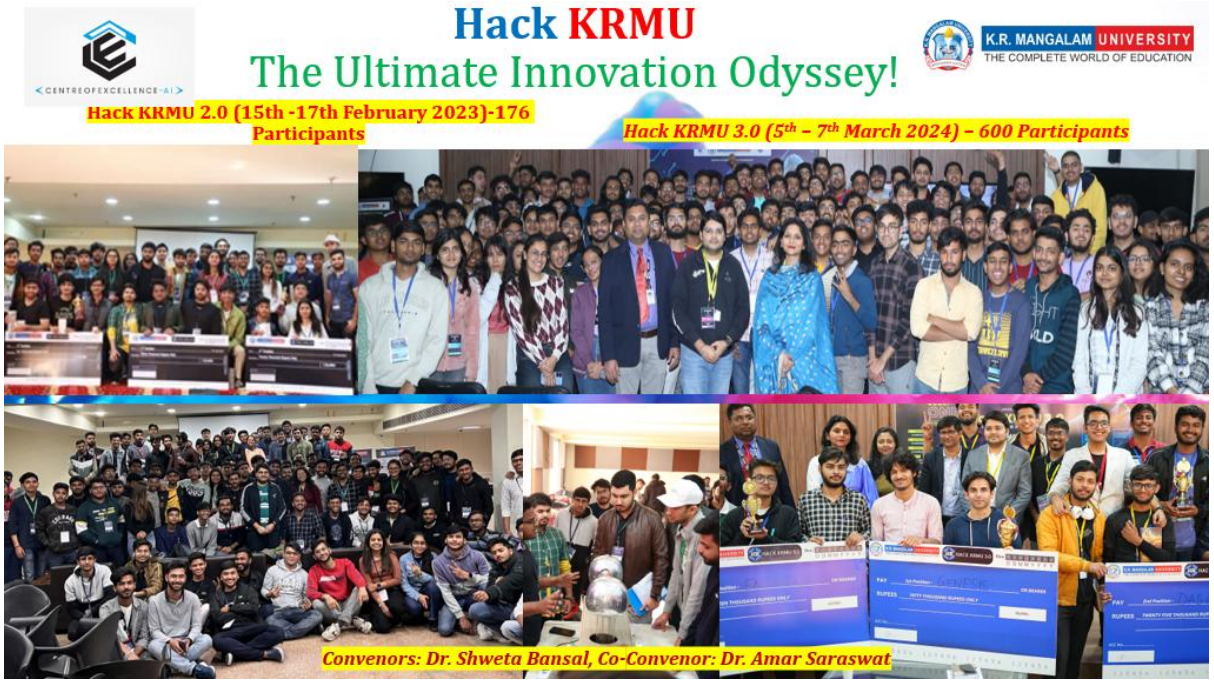
artificial intelligence, smart systems, and **sustainability**, emphasizing the integration of innovation with real-world applications. The conference encouraged **cross-disciplinary collaboration**, providing participants with opportunities for academic networking and knowledge sharing. Researchers and students showcased their work through posters and presentations that reflected innovation and applicability to contemporary global challenges. The sessions fostered dialogue between academia and industry, inspiring new perspectives on engineering research and development. MRIE-2023 significantly enhanced the university's academic reputation, promoted **international collaboration**, and enriched participants' understanding of multidisciplinary engineering advancements. The conference successfully achieved its goal of promoting innovation, learning, and the pursuit of excellence in engineering research and education.

Dignitaries releasing the conference proceedings during the inaugural ceremony of MRIE-2023 at K.R. Mangalam University.

Certificate and memento presentation to the keynote speaker in recognition of contribution to MRIE-2023.

Hackathon: Hack K R Mangalam University 3.0

The Hack K R **Mangalam University** 3.0 **hackathon, held in** March 2024**, was a flagship annual event organized by the** School of Engineering and Applied Sciences **under the guidance of** Dr. Shweta Bansal **and** Dr. Amar Saraswat**. The event served as a dynamic platform for students to demonstrate their** technical expertise, creativity, and problem-solving abilities **through collaborative, hands-on coding sessions. Designed to foster** innovation, teamwork, and mentorship**, the hackathon brought together multi-disciplinary teams to address real-world challenges through technology-driven solutions. The hackathon featured** continuous coding rounds**,** mentorship checkpoints**, and** evaluation sessions**, ensuring that participants received expert guidance throughout the competition. Project themes encompassed** social innovation, sustainability, smart campus applications, and AI-based solutions**, reflecting both academic relevance and societal impact. Teams were judged on their** innovation, functionality, and presentation skills**, with top performers receiving awards and recognition.** Hack K R **Mangalam University** 3.0 **significantly enhanced students' practical learning experience, technical competence, and collaborative approach. The event successfully promoted a culture of** innovation, experiential learning, and research orientation**, positioning the university as a hub for emerging technological talent and creativity.**



Hack K R Mangalam University – The Ultimate Innovation Odyssey served as a premier hackathon platform fostering creativity, collaboration, and technological excellence among students under the mentorship of Dr. Shweta Bansal and Dr. Amar Saraswat.

AzureDevDay-Cloud Native Tour : "Building Cloud Native Application with Bellerina and Choreo-Workshop" (21st February 2024) in collaboration with Computer Society of India

The **Workshop on "Building Cloud-Native Applications with Ballerina and Choreo"**, organized on **21st February 2024** in collaboration with the **Computer Society of India (CSI)**, provided participants with in-depth exposure to **cloud-native architecture, microservices design, and modern development practices**. The session aimed to enhance participants' technical competence by integrating theoretical understanding with practical implementation through **hands-on coding and live demonstrations.** Led by expert facilitators, the workshop introduced the **Ballerina programming language,** designed for cloud services, and **Choreo**, an integration platform used for automating cloud deployments. The participants engaged in interactive labs focused on **developing scalable, secure, and maintainable applications**, leveraging real-time examples and enterprise integration techniques. The program emphasized the adoption of **best practices in cloud-native application design**, promoting efficiency and adaptability in evolving technological environments. The event effectively enhanced the participants' proficiency in **cloud-native**

software development and **enterprise-level orchestration tools**, fostering stronger academia-industry collaboration. Overall, the workshop significantly contributed to aligning academic learning with **industry 4.0 innovations**, preparing students and faculty for future opportunities in **cloud computing and software engineering.**

Participants celebrating the successful completion of the AzureDevDay Cloud Native Tour workshop at K.R. Mangalam University.

Power Seminar on AI & Cloud Computing in collaboration with ICT Academy

The **Power Seminar on AI and Cloud Computing**, held on **5th April 2024** in collaboration with the **ICT Academy**, aimed to enhance the technical understanding of students and faculty regarding the integration of **artificial intelligence (AI)** with **cloud computing technologies.** The seminar served as a platform to explore emerging trends, industry applications, and future opportunities in the AI-cloud ecosystem. The event featured **expert talks, case studies, and interactive sessions** that provided participants with insights into AI fundamentals, cloud architectures, and practical use cases such as **predictive analytics, natural language processing, and computer vision**. Discussions emphasized the growing role of **AI-driven automation, scalability, and innovation** in cloud platforms. Through real-world examples, participants gained clarity on how AI enhances the performance and efficiency of cloud systems. The seminar successfully **upskilled participants** in key AI and cloud computing concepts, enabling faculty to integrate these topics into academic curricula and motivating students to pursue research and projects in this domain. Overall, the program effectively bridged the gap between academic learning and **industry 4.0 technological advancements**, fostering a culture of continuous innovation and digital readiness.

Faculty members and students at the Power Seminar on AI & Cloud Computing organized in collaboration with ICT Academy.

WOEKSHOP ON RESEARCH AND METHODOLOGY

The **Workshop on Research and Methodology**, conducted under the guidance of **Dr. Kaushal Kumar**, aimed to strengthen participants' understanding of systematic and effective research practices. Targeting **faculty members and advanced students**, the workshop emphasized both **qualitative and quantitative research approaches**, focusing on sound research design, proposal development, data collection, and academic writing. Participants were introduced to strategies for **literature review, data management**, and **technical writing**, including practical training in **LaTeX typesetting, Mendeley**, and **JabRef** for bibliography management. The workshop also highlighted ethical research practices, peer-review processes, and the use of digital tools to enhance collaboration and documentation. Through interactive sessions and practical demonstrations, participants gained the skills necessary to design rigorous studies, prepare publishable manuscripts, and uphold research integrity. Overall, the workshop effectively enhanced research competence, writing proficiency, and methodological awareness, thereby fostering a culture of **academic excellence and integrity** within the university's research community.

Dr. Kaushal Kumar addressing participants during the Research and Methodology Workshop at K.R. Mangalam University.

Generative AI Teaching Learning Processes and Research - Workshop*" (09 June 2023)*- Resource Person: Dr C.S Dubey

The **Workshop on Generative AI in Teaching, Learning, and Research**, conducted by **Dr. C.S. Dubey**, focused on the transformative role of **generative artificial intelligence** in enhancing educational and research practices. The session aimed to familiarize participants with AI-driven tools that support **curriculum design, personalized learning**, and **academic content creation**, while also emphasizing **ethical and responsible AI integration**. Through **interactive demonstrations** and hands-on activities, participants explored practical applications of **GPT-based tools** for lesson planning, quiz generation, content summarization, and adaptive learning. The workshop also highlighted the use of AI in **research support**, including literature review automation, data analysis, and manuscript drafting. In addition, discussions addressed challenges related to **academic integrity, transparency**, and the importance of maintaining critical thinking alongside AI use. The program effectively enhanced participants' understanding of **AI's potential in education and research**, fostering digital readiness, innovation, and ethical awareness for integrating generative AI within academic ecosystems.

Poster highlighting the Workshop on Generative AI: Teaching, Learning Processes, and Research organized by K.R. Mangalam University & Centre of Excellence–AI.

Faculty participants attending the workshop on Generative AI for Teaching, Learning, and Research at K.R. Mangalam University.

Prof. C.S. Dubey delivering an expert session on integrating Generative AI in teaching and research methodologies.

Workshop on Scientific Writing Using LATEX- Workshop" (27 April 2024)

The **Workshop on Scientific Writing Using LaTeX**, conducted on **27th April 2024** under the guidance of **Dr. Riman Mandal**, provided an intensive hands-on training session aimed at enhancing participants' proficiency in **academic writing and document preparation** using the **LaTeX typesetting system**. Designed for researchers, faculty members, and students, the workshop emphasized the creation of **professionally formatted research papers, theses, and technical reports** in line with international academic standards. Participants were introduced to the **fundamentals of LaTeX**, including installation, environment setup, and document structuring. The sessions covered **mathematical equation writing, table and figure insertion, cross-referencing, citation management using BibTeX**, and the use of **Beamer** for academic presentations. Practical exercises enabled attendees to develop sample documents and refine their formatting and troubleshooting skills. The workshop significantly improved participants' ability to produce **technically accurate, well-structured, and aesthetically consistent academic documents**. It also enhanced research dissemination quality by promoting clarity, precision, and professionalism in scientific communication. Overall, the program effectively equipped participants with **essential LaTeX skills** vital for advancing research documentation and publication excellence.

Felicitation of the resource person, Dr. Riman Mandal, during the Workshop on Scientific Writing Using LaTeX at K.R. Mangalam University.

Empowering Research Excellence: Tools for Effective Scientific Writing

The **Workshop on "Empowering Research Excellence: Tools for Effective Scientific Writing"**, conducted on **11th May 2024** by **Dr. Rupesh Kumar**, aimed to enhance researchers', faculty members', and students' proficiency in **scientific writing and research communication**. The workshop provided comprehensive training on integrating **digital tools and conceptual strategies** to improve the quality, efficiency, and originality of academic manuscripts. Participants were introduced to **AI-based writing assistants** such as *Writefull* and *Ref-n-Write*, which support language refinement, paraphrasing, and coherence. The sessions also covered the use of **reference management software, plagiarism detection tools**, and effective methods for **literature review, data presentation**, and **peer-review responses**. Hands-on exercises enabled attendees to apply these tools practically while mastering the structure and formatting of scientific papers in line with journal standards. The workshop significantly improved participants' competence in managing complex writing tasks and maintaining research integrity. Overall, it successfully fostered a **culture of academic excellence**, equipping scholars with advanced digital writing skills and conceptual clarity essential for impactful research publication and professional growth.

Group photograph of participants with Dr. Rupesh Kumar during the Workshop on "Empowering Research Excellence: Tools for Effective Scientific Writing."

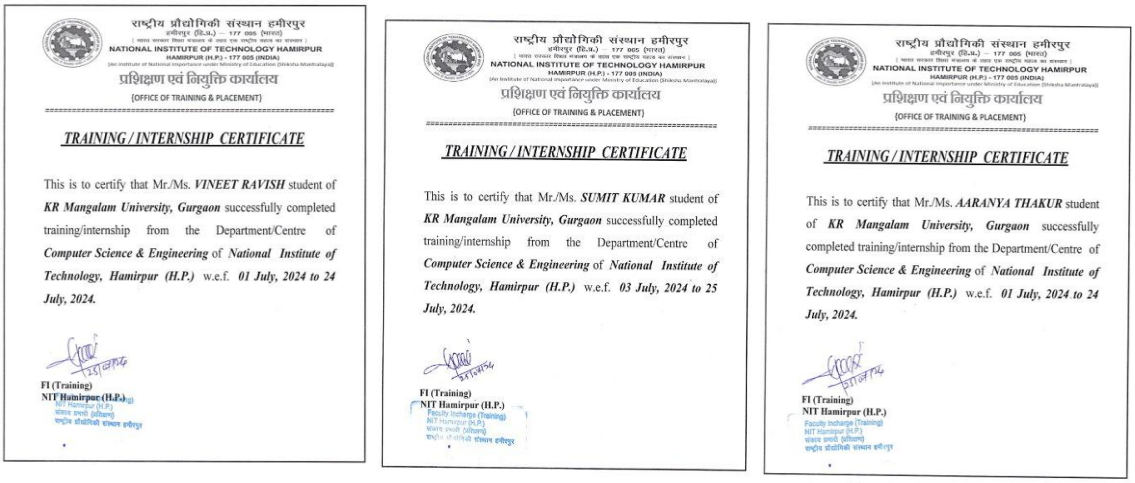
Participants engaging in a hands-on session on digital tools for enhancing scientific writing and research documentation.

National Institute of Technology

The **Three-Week Summer Internship Programme at the National Institute of Technology (NIT) Hamirpur**, conducted from **July to August 2024**, provided engineering students with an immersive experience in **research and development (R&D)** across multiple disciplines. Designed for B.Tech, M.Tech, and M.Sc. students with strong academic performance, the program offered structured mentorship and exposure to **cutting-edge technologies** under the supervision of NIT Hamirpur's distinguished faculty. Interns were assigned to specialized projects within various academic departments and research centers, covering domains such as **artificial intelligence, machine learning, wireless networks, material science, chemical, and civil engineering**. The internship emphasized guided research, experimental design, and simulation-based problem-solving. Through collaborative learning and continuous evaluation, participants developed **practical expertise, innovation capability, and analytical thinking** relevant to modern engineering challenges. The initiative notably enhanced participants' **industry readiness and research aptitude**, bridging the gap between theoretical education and applied technological practice. It also strengthened academia–industry linkages, fostering a culture of inquiry, innovation, and professional development. Overall, the internship program at NIT Hamirpur served as a

transformative platform that cultivated **technical competence, independent learning, and research excellence** among aspiring engineers.

Students of K.R. Mangalam University at the National Institute of Technology Hamirpur during the 2024 Summer Internship Programme.



राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर
NATIONAL INSTITUTE OF TECHNOLOGY HAMIRPUR
HAMIRPUR (H.P.) - 177 005 (INDIA)
प्रशिक्षण एवं नियुक्ति कार्यालय
(OFFICE OF TRAINING & PLACEMENT)

TRAINING / INTERNSHIP CERTIFICATE

This is to certify that Mr./Ms. ***VINEET RAVISH*** student of ***KR Mangalam University, Gurgaon*** successfully completed training/internship from the Department/Centre of ***Computer Science & Engineering*** of ***National Institute of Technology, Hamirpur (H.P.)*** w.e.f. ***01 July, 2024 to 24 July, 2024.***

FI (Training)
NIT Hamirpur (H.P.)

राष्ट्रीय प्रौद्योगिकी संस्थान हमीरपुर
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प्रशिक्षण एवं नियुक्ति कार्यालय
(OFFICE OF TRAINING & PLACEMENT)

TRAINING / INTERNSHIP CERTIFICATE

This is to certify that Mr./Ms. ***SUMIT KUMAR*** student of ***KR Mangalam University, Gurgaon*** successfully completed training/internship from the Department/Centre of ***Computer Science & Engineering*** of ***National Institute of Technology, Hamirpur (H.P.)*** w.e.f. ***03 July, 2024 to 25 July, 2024.***

FI (Training)
NIT Hamirpur (H.P.)

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प्रशिक्षण एवं नियुक्ति कार्यालय
(OFFICE OF TRAINING & PLACEMENT)

TRAINING / INTERNSHIP CERTIFICATE

This is to certify that Mr./Ms. ***AARANYA THAKUR*** student of ***KR Mangalam University, Gurgaon*** successfully completed training/internship from the Department/Centre of ***Computer Science & Engineering*** of ***National Institute of Technology, Hamirpur (H.P.)*** w.e.f. ***01 July, 2024 to 24 July, 2024.***

FI (Training)
NIT Hamirpur (H.P.)

Certificates of completion of the NIT Hamirpur Summer Internship 2024.