

CSE@GNIT Bulletin

2023 - 24

Department of Computer Science & Engineering

ISSUE	SEM
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MESSAGE FROM PRINCIPAL'S DESK



Guru Nanak Institute of Technology (GNIT), established in 2003 under the Guru Nanak Educational Trust, is a premier institution of the JIS Group Educational Initiatives. Affiliated with Maulana Abul Kalam Azad University of Technology (MAKAUT) and approved by AICTE, UGC, NAAC (A+), and NBA, GNIT offers undergraduate, postgraduate, and doctoral programmes in engineering and technology. The institute became autonomous in 2016 and is the first private engineering college in West Bengal to achieve NAAC A+ accreditation. Located in North Kolkata, GNIT provides a modern, student-friendly campus with advanced laboratories, smart classrooms, digital library facilities, sports infrastructure, and innovation centres. The institute promotes an eco-friendly, plastic-free, smoking-free, and ragging-free environment that supports the holistic development of students. With around 2,000 students, GNIT combines strong academic foundations with practical learning through project-based education, internships, industry collaborations, cloud computing, High Performance Computing (HPC), and state-of-the-art research facilities.GNIT actively promotes research and innovation through AICTE MODROB, DST, SERB, and MOFPI funded projects, along with entrepreneurship initiatives under the Institution's Innovation Council (IIC).

With its emphasis on academic excellence, research, innovation, and professional development, GNIT continues to prepare competent engineers, researchers, and future leaders capable of meeting global challenges.

Prof. (Dr.) Swarup Kumar Mitra

Principal, Guru Nanak Institute of Technology, Kolkata

MESSAGE FROM HOD'S DESK



It is my pleasure to present this edition of the **CSE@GNIT Bulletin**, highlighting the achievements, innovations, and academic activities of the Department of Computer Science & Engineering. This newsletter reflects our commitment to quality education, research, and the holistic development of our students.

Our department continuously strives to provide an excellent learning environment through modern teaching practices, technical events, industry interactions, research initiatives, and skill development programs. We are proud of the accomplishments of our students and faculty, whose dedication continues to bring recognition to the department.

I congratulate everyone who has contributed to these achievements and thank our faculty, students, alumni, and industry partners for their continued support. I hope this newsletter inspires all readers and encourages us to pursue greater heights of excellence.

Prof. (Dr.) Suman Bhattacharya

Head of the Department

Department of Computer Science & Engineering

Guru Nanak Institute of Technology

MESSAGE FROM EDITOR'S DESK



Welcome to the Editor's Desk of the **CSE@GNIT Bulletin**. It is a pleasure to present another edition highlighting the achievements, innovations, and vibrant activities of the Department of Computer Science and Engineering, Guru Nanak Institute of Technology. This newsletter reflects the department's continuous pursuit of academic excellence, research, innovation, and holistic student development.

Within these pages, you will discover highlights of technical workshops, seminars, conferences, faculty and student achievements, research contributions, industry collaborations, placement success, and various departmental events. Each accomplishment represents the dedication, creativity, and teamwork of our students and faculty members. We hope this edition inspires our readers, celebrates our collective journey, and strengthens the spirit of learning and innovation that defines the CSE department. We look forward to sharing many more milestones and success stories in the editions to come.

Ms. Debapriya Sengupta

Assistant Professor

Chief Editor, CSE@GNIT Bulletin

Department of Computer Science & Engineering

Guru Nanak Institute of Technology

DEPARTMENTAL VISION

To produce proficient professionals of global standard with respect to industry, academia, and entrepreneurship who can play a key role in their respective domain and become a responsible citizen for the society.

DEPARTMENTAL MISSION

DM-1: To impart quality education with holistic development to produce professionals with leadership traits.

DM-2: To impart knowledge on emerging technologies and entrepreneurship skills to produce technocrats of global standard and entrepreneurs.

DM-3: To promote interdisciplinary work culture and opportunity to work in a team through collaborative research and project work.

DM-4: To inculcate professional ethics and moral responsibility for a better society.

PEO

PEO 1: Our graduates will establish themselves as effective professionals in industry, academia and entrepreneurship.

PEO 2: Our graduates will become profound researchers in multiple domains.

PEO 3: Our graduates will act as a leader in society.

PROGRAMME SPECIFIC OUTCOMES (PSOS)

PSO 1: Ability to use efficient algorithm for designing and developing software applications and products.

PSO 2: Ability to correlate computer science and core engineering subjects to solve real life problems across multiple domains.

PSO 3: Ability to write code efficiently in competitive environment in national and international platform.

ABOUT THE DEPARTMENT



The Department of Computer Science and Engineering, established in 2003, stands out as a premier destination for academic excellence and research-driven learning. Widely recognized as a B.Tech in Computer Science College in Kolkata, the department offers a vibrant environment where students receive top-tier technical education alongside holistic personal development through various co-curricular and extra-curricular activities.

Ranked among the Top B.Tech CSE Colleges in Kolkata, the department provides students with a strong foundation in both theoretical knowledge and practical skills. Focus areas include the latest technologies such as Artificial Intelligence, Machine Learning, Cybersecurity, Cloud Computing, and Data Science. Students benefit from advanced laboratories, live projects, and industry collaborations, ensuring hands-on learning experiences. The department also fosters a robust research culture, encouraging students to publish research papers, work on innovative projects, and participate in departmental newsletters and technical magazines to enhance their analytical and communication skills.

As one of the Top Computer Science Engineering Colleges in Kolkata and counted among the best colleges for B.Tech CSE in India, the department is committed to producing graduates who are not only academically proficient but also equipped with leadership qualities, entrepreneurial mindsets, and a global perspective. Whether you are searching for the best colleges for B.Tech CSE, reputable B.Tech CSE colleges near you, or simply looking for a college that combines academic rigor with industry relevance, this department stands as a trusted choice.

EDITORIAL TEAM

Editor

Ms. Debapriya Sengupta, Assistant Professor, Dept. of CSE

Student Editors

Krittika Mondal,3rd Year, CSE, Student Editor

Priyanshu Banerjee,3rd Year, CSE, Graphic Designer

Tanisha Talukdar,3rd Year, CSE, Technical Content Scrutinizers

Arpan Mondal,2nd Year, CSE, Technical Content Scrutinizers

Pramila Das,2nd Year, CSE, Technical Content Scrutinizers

Courses Offered (CAY: 2023-24)

Course Name	Duration	Intake
B.Tech	4 years	180
M.Tech	2 years	18

Contact us:

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Phone: +91 33 2523 3900
Email: info.gnit@jisgroup.org
Website: http://www.gnit.ac.in



SAMPAN 2K23: FRESHERS' WELCOME

The Department of Computer Science & Engineering, GNIT, welcomed its newest members with **SAMPAN 2K23**, a vibrant Freshers' Welcome celebration held on **3 November 2023**. The event brought together faculty members, seniors, and freshers in an atmosphere filled with enthusiasm, excitement, and camaraderie. Through music, cultural performances, interactions, and moments of celebration, the programme provided the new students with an opportunity to connect with their peers and become a part of the departmental community. **SAMPAN 2K23** marked a memorable beginning to their academic journey at GNIT, fostering friendship, confidence, and a strong sense of belonging.











STUDENT CHAPTER ACTIVITIES AND TECHNICAL EVENTS

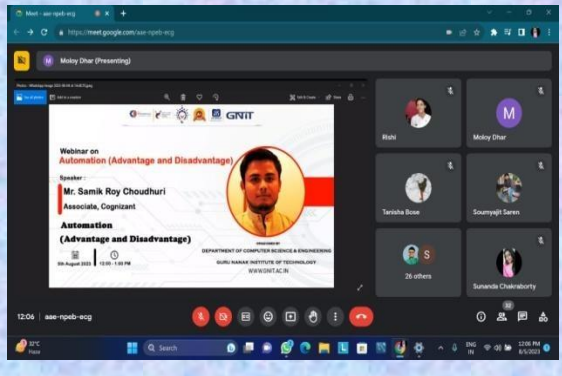
The Department of Computer Science and Engineering, through its active Professional Society Chapters, organized a series of seminars and workshops during the 2023–24 academic session to enrich students' technical knowledge and career awareness. These events provided a platform for students to interact with industry experts, academicians, and entrepreneurs while exploring emerging technologies and higher education opportunities.

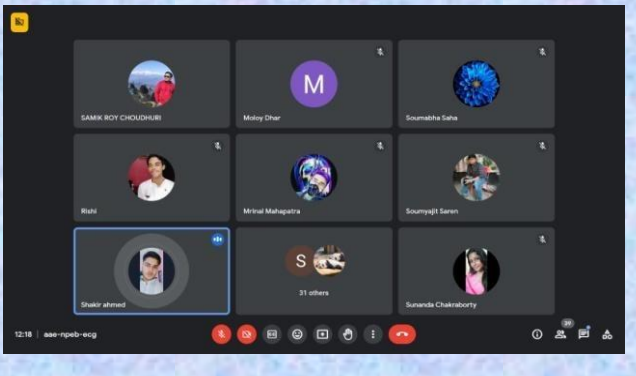
- On **3rd August 2023**, the **Institute of Engineers** organized an inspiring **Seminar on "Robot Man of India – Uncut by the Leading Entrepreneur"**, where students gained valuable insights into robotics, innovation, entrepreneurship, and the journey of a successful technology leader.





- The **SESI Student Chapter** conducted another engaging webinar on **"Automation: Advantage and Disadvantage"** on **5th August 2023**. The session explored the impact of automation across various industries, discussing both its benefits and the challenges it presents in the modern workforce.

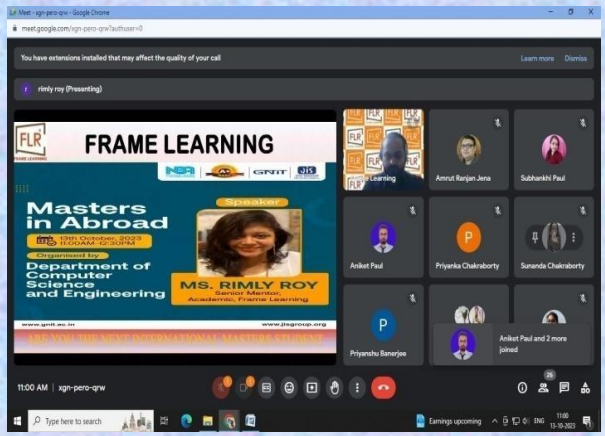


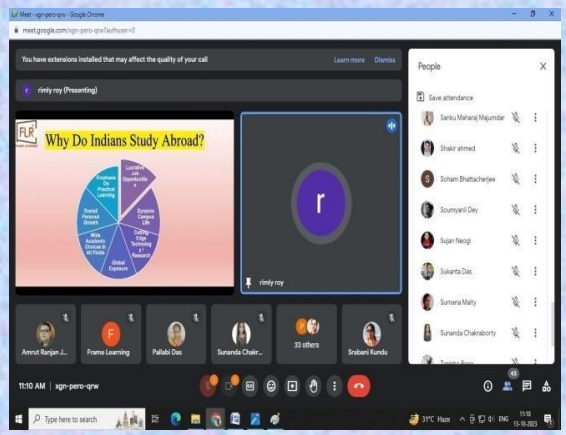


- A **One-Day Technical Workshop on "AI-Enabled Enterprise Resource Planning (ERP): Intelligent Business Process Automation and Analytics"** was organized by **Thinkagain Educational Services LLP (Thinkagain Lab)** on **26th August 2023**. The workshop provided students with valuable insights into the applications of Artificial Intelligence in ERP systems, intelligent business process automation, and data-driven analytics. The event offered an interactive platform for students to enhance their technical knowledge and understand the practical applications of emerging technologies in modern business environments.



To guide students aspiring for international education, the **ISTE Student Chapter** organized a **Seminar on "Masters in Abroad"** on **13th October 2023**. The seminar covered higher education opportunities, admission procedures, scholarships, and career prospects in foreign universities.





- The series concluded with a hands-on **Workshop on "Machine Learning & Data Science with Python"**, organized by the **Institute of Engineers** on **20th November 2023**. The workshop provided practical exposure to Python programming and machine learning techniques, enabling participants to strengthen their programming skills and understand real-world applications of data science.





These professional society initiatives significantly contributed to enhancing students' technical competencies, promoting innovation, and preparing them for academic excellence and successful professional careers.

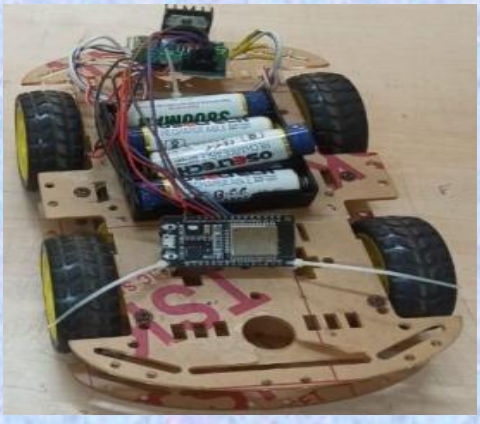
FACULTY INNOVATIONS: WORKING MODELS AND PROTOTYPES

1. IoT-Based Energy-Efficient Smart and Hybrid Cold Storage for Preserving Daily Perishables

Faculty Name: Sourish Mitra

The *IoT-Based Energy-Efficient Smart and Hybrid Cold Storage for Preserving Daily Perishables* project focuses on developing an intelligent storage system for preserving vegetables using IoT and AI technologies. The system can automatically identify different vegetables and allocate them to partitioned storage compartments while maintaining optimal temperature and humidity levels. Unlike conventional refrigerators, it dynamically adjusts the cooling process to reduce unnecessary energy consumption. A zeolite-based passive absorption mechanism effectively controls moisture, carbon dioxide (CO_2), and volatile organic compounds (VOCs) without requiring additional power. As a result, the

system maintains hygienic air quality, ensures stable humidity, extends the shelf life of vegetables, and provides an eco-friendly, energy-efficient alternative to traditional cold storage methods. The project has also resulted in the publication of an IEEE conference paper titled "*IoT-Based Energy-Efficient Smart and Hybrid Cold Storage for Preserving Daily Perishables*" with DOI: 10.1109/STEPCon66008.2025.11473447.



2. Solar-Based Cell Phone Charger

Faculty Name: Sumit Kumar Banerjee

The *Solar-Based Cell Phone Charger* project aims to develop a portable and environmentally friendly charging system that utilizes solar energy to power mobile devices. The system efficiently converts sunlight into electrical energy, stores it, and delivers a stable power supply for safe mobile charging even under varying sunlight conditions. This project demonstrates the practical application of renewable energy technologies, promoting sustainable and off-grid power solutions while reducing dependence on conventional electricity sources.



3. Voice-Controlled IoT-Based Vehicle for Lawn Mowing

Faculty Name: Sayani Chandra

The *Voice-Controlled IoT-Based Vehicle for Lawn Mowing* project presents the development of an intelligent lawn-mowing vehicle that can be operated through voice commands using IoT-enabled devices. The system integrates a microcontroller, voice recognition module, and wireless communication technology to control the vehicle's movement and automate lawn-mowing operations efficiently. This project enhances the understanding of IoT-based automation, voice-controlled human–machine interaction, and smart outdoor applications, demonstrating the practical implementation of intelligent automation in everyday tasks.



STUDENT AND MENTORS ACHIEVEMENT



SMART INDIA HACKATHON 2023 (Software Edition)

Description: Participated in a national-level hackathon, collaborating within a team to design and develop an innovative software solution for a real-world problem statement. Engaged in problem analysis, system design, and rapid prototyping. Enhanced skills in teamwork, problem-solving, and technical implementation.

Award: **Participating at Grand-Finale**

Faculty Mentor: Dr. Ananjan Maiti

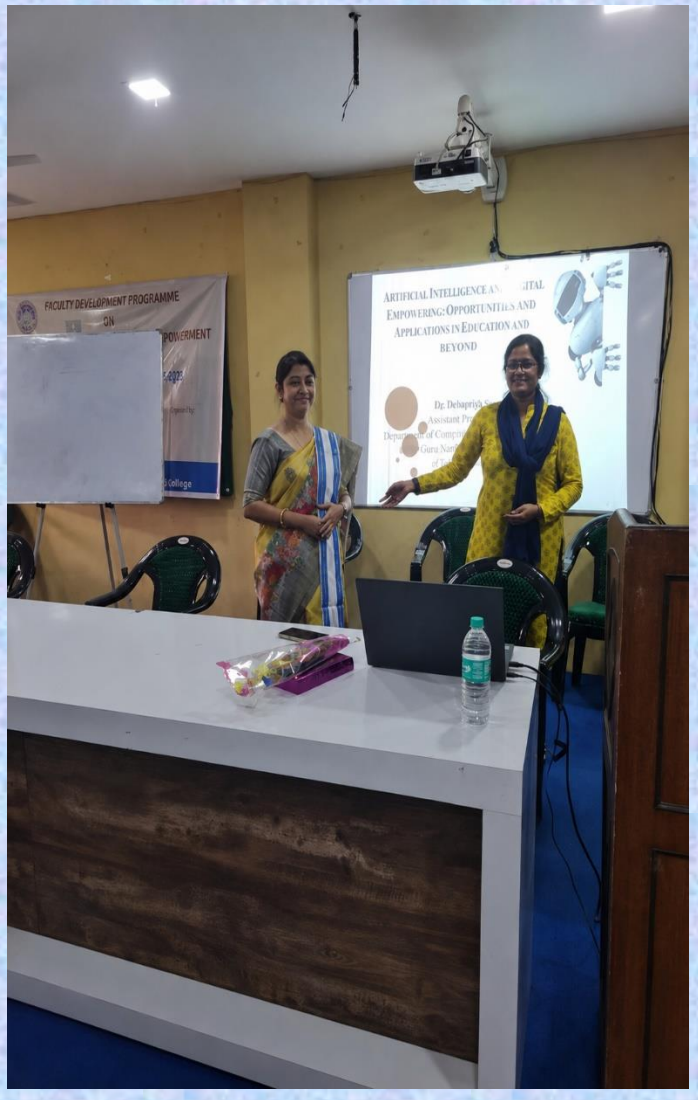
Place: Amravati, Nagpur

Date: 19th-20th December, 2023



FACULTY CONTRIBUTIONS AS RESOURCE PERSONS IN FACULTY DEVELOPMENT PROGRAMMES (FDPS)

- Dr. Ipsita Saha served as a Resource Person in the Faculty Development Programme (FDP) on "Artificial Intelligence and Digital Empowering", organized by Prabhu Jagatbandhu College, Howrah, from 21st November 2023 to 25th November 2023. During the programme, she delivered expert sessions on emerging trends in Artificial Intelligence and digital technologies, providing valuable insights to faculty members and participants. Her contributions significantly enriched the programme by promoting knowledge sharing, academic excellence, and the effective integration of AI-driven technologies in higher education.







PRABHU JAGATBANDHU COLLEGE

(Affiliated to University of Calcutta)

Andul Road, Baikul, P.O. – Jagatbandhu Pukur, Howrah – 711 109, West Bengal, India

Certificate of Recognition

This is to recognize and acknowledge the valuable contribution of

Dr. Ipsita Saha

as

RESOURCE PERSON

in the Faculty Development Programme (FDP) on

'Artificial Intelligence and Digital Empowering'

held from 21st November, 2023 to 25th November, 2023

by Prabhu Jagatbandhu College, Howrah.

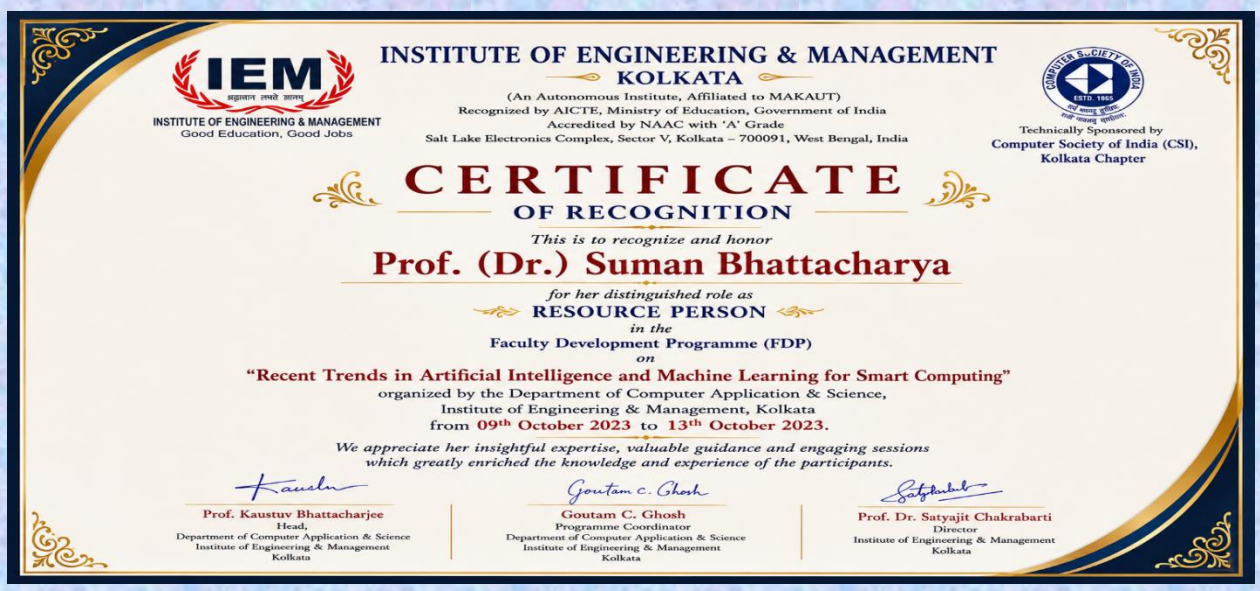
Her expertise, insightful sessions and inspiring guidance greatly enriched the programme and benefitted the participants.

Suchismita Saha
Programme Coordinator
Faculty Development Programme
Prabhu Jagatbandhu College
Howrah

Ruma Saha
IQAC Coordinator
Prabhu Jagatbandhu College
Howrah

Subrata Kumar Ray
Dr. Subrata Kumar Ray
Principal
Prabhu Jagatbandhu College
Howrah

- Prof. (Dr.) Suman Bhattacharya was invited as a Resource Person in the Faculty Development Programme (FDP) on "Recent Trends in Artificial Intelligence and Machine Learning for Smart Computing", organized by the Department of Computer Application & Science, Institute of Engineering & Management (IEM), Kolkata, from 9th October 2023 to 13th October 2023. She delivered expert lectures on the latest developments in Artificial Intelligence, Machine Learning, and Smart Computing, enabling participants to gain a deeper understanding of advanced computational technologies. Her sessions were highly appreciated for their practical relevance, technical depth, and contribution to enhancing the professional competencies of faculty members and researchers.



IEM
INSTITUTE OF ENGINEERING & MANAGEMENT
Good Education, Good Jobs

INSTITUTE OF ENGINEERING & MANAGEMENT
KOLKATA

(An Autonomous Institute, Affiliated to MAKAUT)
Recognized by AICTE, Ministry of Education, Government of India
Accredited by NAAC with 'A' Grade
Salt Lake Electronics Complex, Sector V, Kolkata – 700091, West Bengal, India

Technically Sponsored by
Computer Society of India (CSI),
Kolkata Chapter

CERTIFICATE
OF RECOGNITION

This is to recognize and honor

Prof. (Dr.) Suman Bhattacharya

for her distinguished role as

RESOURCE PERSON

in the

Faculty Development Programme (FDP)

on

"Recent Trends in Artificial Intelligence and Machine Learning for Smart Computing"

organized by the Department of Computer Application & Science,
Institute of Engineering & Management, Kolkata
from 09th October 2023 to 13th October 2023.

We appreciate her insightful expertise, valuable guidance and engaging sessions which greatly enriched the knowledge and experience of the participants.

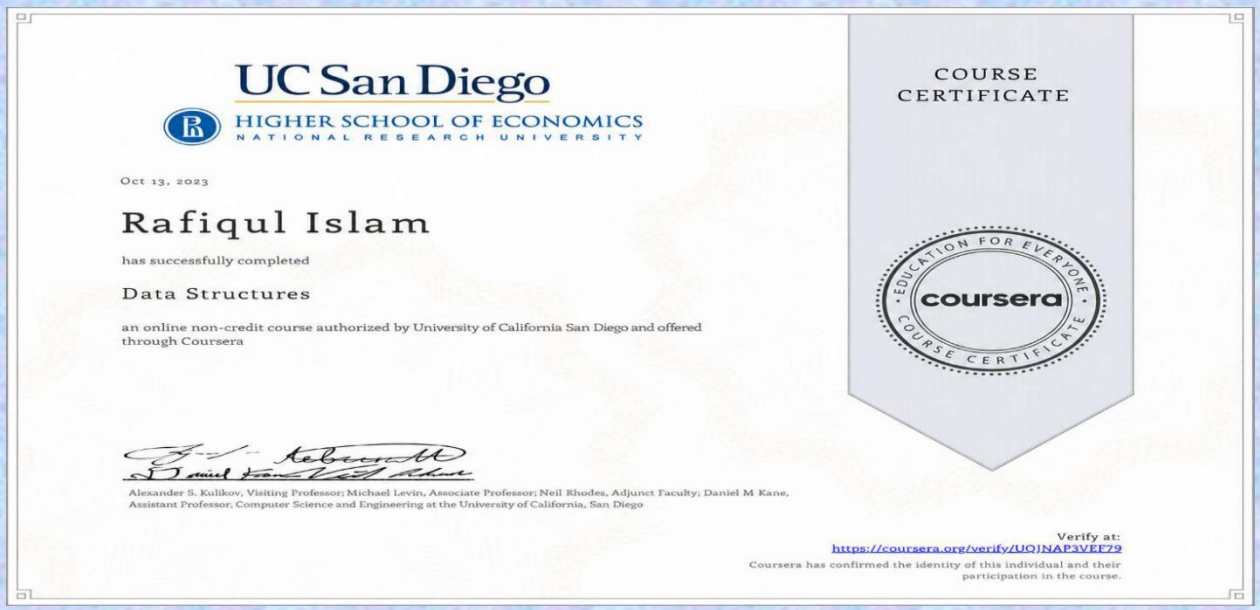
Prof. Kaustuv Bhattacharjee
Head,
Department of Computer Application & Science
Institute of Engineering & Management
Kolkata

Goutam C. Ghosh
Programme Coordinator
Department of Computer Application & Science
Institute of Engineering & Management
Kolkata

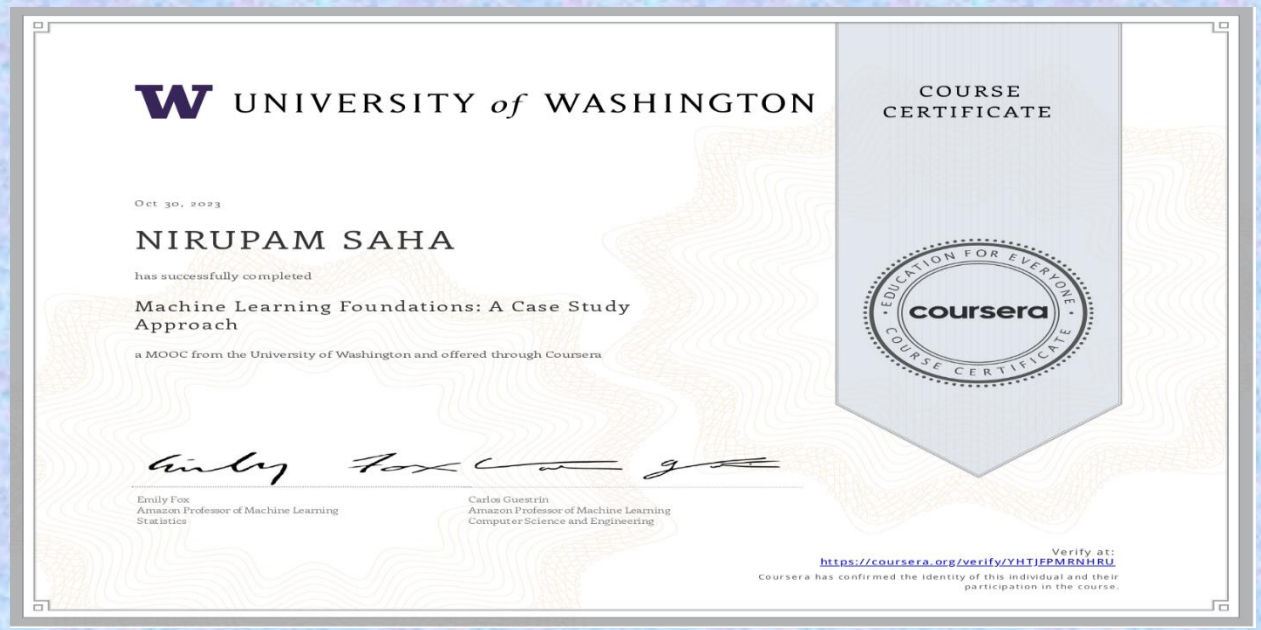
Prof. Dr. Satyajit Chakrabarti
Director
Institute of Engineering & Management
Kolkata

FACULTY PROFESSIONAL DEVELOPMENT

- Rafiqul Islam successfully completed the "Data Structures" course from the University of California San Diego through Coursera, demonstrating his commitment to continuous professional learning and technical skill enhancement.



- Ms. Nirupam Saha successfully earned a Coursera certification in "Machine Learning Foundations: A Case Study Approach," offered by the University of Washington, reflecting her commitment to continuous professional development and strengthening her expertise in Machine Learning.



- Ms. Priyanka Chakraborty successfully earned a Coursera Course Certificate in "Data Structures," an online non-credit course authorized by the University of California San Diego (UC San Diego). This achievement reflects her commitment to continuous professional learning and enhancement of technical expertise in Computer Science.



- Md. Tausif Mallick successfully earned a Coursera Course Certificate in "Data Structures," an online non-credit course authorized by the University of California San Diego (UC San Diego) and offered through Coursera. This achievement demonstrates his commitment to continuous professional learning and strengthening his technical expertise in Computer Science and Engineering.



- Ms. Sayani Chandra successfully earned a Coursera Course Certificate in "Machine Learning Foundations: A Case Study Approach," a MOOC offered by the University of Washington through Coursera. This achievement highlights her commitment to continuous learning and professional development in the field of Machine Learning, strengthening her knowledge of fundamental concepts and practical applications.



- Ms. Mandira Banik successfully earned a Coursera Course Certificate in "Machine Learning Foundations: A Case Study Approach," a MOOC offered by the University of Washington through Coursera. This achievement reflects her commitment to continuous professional learning and enhancing her knowledge and expertise in Machine Learning and its practical applications.



FACULTY RESEARCH & SCHOLARLY PUBLICATIONS

Publication Highlights | July–December 2023

International Journal Publications — 3
International Conference Publications — 12
Book Chapters / Proceedings — 1

International Journal Publications

01 | Srabani Kundu
A Study on Boundary Detection in Wireless Sensor Networks | *Innovations in Systems and Software Engineering, Springer* | September 2023 | DOI: 10.1007/s11334-022-00488-w

02 | Mandira Banik, Sanjay Kumar
Blockchain-Based Public Key Encryption with Keyword Search for Medical Data Sharing in Cloud Environment | *Journal of Information Security and Applications* | November 2023 | DOI: 10.1016/j.jisa.2023.103626

03 | Sourish Mitra, Rafiqul Islam, Bidyutmala Saha
IoT Based Suitable Crop Identification Technique after Analyzing Soil and Predicting Local Weather | *Gradiva Review Journal* | November 2023

International Conference Publications

01 | Sayani Chandra, Sangeeta Bhattacharya
Depression Inducing Emotion Detector in Online Social Networks | *International Conference on Innovations in Software Architecture and Computational Systems (ISACS 2022), AIP Conference Proceedings, Vol. 2876* | September 2023 | DOI: 10.1063/5.0166616

02 | Sangeeta Bhattacharya, Sayani Chandra
Customer Behaviour Forecasting Using Predictive Analysis of Sales Data | *ISACS 2022, AIP Conference Proceedings, Vol. 2876* | September 2023 | DOI: 10.1063/5.0166610

03 | Madhusmita Mishra, Amrut Ranjan Jena, Snehashis Chakraborty, Subhajit Pati, Subarna Guin
An Intelligent Model for Predicting Human Diseases by Using Machine Learning Techniques | *ISACS 2022, AIP Conference Proceedings, Vol. 2876* | September 2023 | DOI: 10.1063/5.0166581

04 | Amrut Ranjan Jena, Ipsita Saha
A Comparative Analysis of Financial Fraud Detection in Credit Card by Decision Tree and

Random Forest Techniques | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166542

05 | Ananjan Maiti, Dola Saha, Chiranjib Dutta, Karnapali Mukhopadhyay, Rooprekha Baksi
Detection of Skin Cancer Through Shape Features and Grid Search Machine Learning Approach | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166715

06 | Moloy Dhar, Amrut Ranjan Jena, Paramita Saha
Caption an Object using the Pre-trained Deep Learning Model for Single Shot Multi-Box Detector | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166620

07 | Amrut Ranjan Jena, Moloy Dhar, Mandira Banik
A Study on Predictive Analysis Through Machine Learning for Data Security | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166544

08 | Ayushman Hait, Bappaditiya Roy, Arup Bhattacharjee, Dibyendu Kumar Das, Ainik Sarkar, Ipsita Saha
A Technique towards Disease Prediction: An Approach of Machine Learning | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166779

09 | Rupak Chakraborty, Sourish Mitra, Rafiqul Islam, Bidyutmala Saha, Nirupam Saha
A New Composite Kernel-Based Classification Approach of Hyperspectral Images | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0170589

10 | Mandira Banik, Amrut Ranjan Jena
Recognizing Chemical Structures Drawn by Hand Using Deep Learning Algorithms and Predict Probable Chemical Structure | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0167028

11 | Pallabi Das, Rajashree Nayak
Preprocessing Retinal Fundus Images to Localize Lesions for Identification of Diabetic Eye Diseases | ISACS 2022, AIP Conference Proceedings, Vol. 2876 | September 2023 | DOI: 10.1063/5.0166533

12 | Ipsita Saha, Amit Kundu, Sadhan Kumar Ghosh
AI Based Interpretive Structural Modeling Analysis for Risk Management Integration of ERP

Implementation | *ISACS 2022, AIP Conference Proceedings, Vol. 2876* | September 2023 | DOI: 10.1063/5.0166774

Book Chapters

01 | Pallabi Das, Rajashree Nayak
Explainable CAD System for Early Detection of Diabetic Eye Diseases: A Review | *Lecture Notes in Electrical Engineering, Vol. 1066* | Springer | November 2023 | DOI: 10.1007/978-981-99-4634-1_50

FACULTY PATENTS & INNOVATIONS

01 | Dr. Kakali Bandyopadhyay, Dr. Santanu Kr. Sen, Sourish Mitra, Soumya Brata Saha, Trina Dutta
Automated Lemon Processing Device | Patent No.: 202331060310 | Published: 13 October 2023 | Status: Published | Assignee: Guru Nanak Institute of Technology

02 | Dr. Sangeeta Bhattacharya, Tridib Chakraborty, Suparna Karmakar, Partha Sarkar, Bikramjit Sarkar
Automated Nail Designing Device | Patent No.: 202331060312 | Published: 20 October 2023 | Status: Published | Assignee: Guru Nanak Institute of Technology

03 | Karabi Ganguly, Sandip Ghosh, Dr. Barnali Kundu, Dr. Mahamuda Sultana, Avali Banerjee
Automated Nail Art Device | Patent No.: 202331060311 | Published: 24 November 2023 | Status: Published | Assignee: Guru Nanak Institute of Technology

04 | Dr. Debasree Saha, Dr. Mahamuda Sultana, Dr. Suman Bhattacharya
AI-Optimized Portable Solar and Renewable Energy EV Charger | Patent No.: 202331075382 | Published: 24 November 2023 | Status: Published | Assignee: Guru Nanak Institute of Technology