


# SEANEWS



Centre of Excellence in Safety Engineering and Analytics  
(CoE-SEA)  
IIT Kharagpur

Volume 3  
2023

## CoE-SEA offers 2-years M.Tech. in 'Safety Engineering and Analytics'



### 2-year M.Tech in SAFETY ENGINEERING AND ANALYTICS

Offered by  
Centre of Excellence in Safety Engineering and Analytics (CoE-SEA)  
Indian Institute of Technology (IIT) Kharagpur

**Application Process**  
Applications are to be submitted only ONLINE by accessing the website  
<https://gateoffice.iitkgp.ac.in/jmp>  
All candidates are required to register in the Common Offer Acceptance Portal (COAP) before applying online.

**Contact us**  
[coesea@iitkgp.ac.in](mailto:coesea@iitkgp.ac.in)

Starting from  
AUTUMN 2024

#### Features

- ✓ Blend of concept development and hands on training
- ✓ Project based learning
- ✓ State of the art laboratory facility
- ✓ Skill development for both industry and research

#### Eligibility

- ✓ Regular: 4 years UG degree (in Engineering) + GATE qualification (in any of AE/AG/CE/CH/CS/EC/EE/ES/IN/ME/MN/MT/NM/PI/PE/BT/GG/NM/XE/TF)
- ✓ Sponsored: For eligible sponsored candidates, selection will be through written test and/or interview conducted based on guidelines/norms of the institute

#### Focus

- ✓ Process Safety Engg. & Mgmt.
- ✓ Occupational Safety & Health
- ✓ Human Factors & Ergonomics
- ✓ Reliability and Quality
- ✓ Safety Economics
- ✓ Data Analytics
- ✓ Leadership
- ✓ Industry/Real-life Projects

#### Course Structure

Semester	Subjects & Projects
I	Depth Core - Five (including Seminar) Depth Electives - Three
II	Depth Core - Three Depth/Breadth Electives - Four Project - I
III	Summer Internship Project - II
IV	Project-III

1<sup>st</sup> year classroom  
2<sup>nd</sup> year projects

The Centre is offering a new interdisciplinary 2-years M. Tech. program in 'Safety Engineering and Analytics'. This course will offer a pathway to diverse, high-demand safety and analytics careers. The objective of this course is to impart M. Tech students with a holistic view of safety engineering and analytics across an organization through engineering approaches, use of technologies, advanced analytics, and managerial insights. The primary focuses of this course are systems engineering, learning from data, predicting the future, taking data driven decisions, and developing smart engineering solutions. The course will accept 15 regular GATE qualified students and 10 sponsored candidates from industries and research laboratories.

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International Conference on  
Safety, Health, and Analytics-Driven  
Governance for Sustainable Development  
(SHADG 2024)

# International Conference on Safety, Health, and Analytics-Driven Governance for Sustainable Development (SHADG 2024)

CoE-SEA is organizing an International Conference on ‘*Safety, Health and Analytics-Driven Governance for Sustainable Development (SHADG 2024)*’ on January 29 & 30, 2024, in collaboration with national and international academic institutions and industry partners. SHADG 2024 aims to provide an inter and multi-disciplinary forum for knowledge sharing, dissemination, networking, and international collaboration in fields of safety, health, sustainability, human factors, and analytics-driven governance. The conference will be conducted in hybrid mode and the venue will be at IIT Kharagpur.

The conference aims to bring together academicians, industry professionals and experts to discuss the recent trends and advancements particularly on the following six tracks:

Track-I: Safety, Security and Analytics (SSA)

Track-II: Reliability, Maintenance and Analytics (RMA)

Track III: Health, Epidemiology and Analytics (HEA)

Track-IV: Risk, Resilience, Sustainability and Analytics (RRSA)

Track-V: Human Factors/Ergonomics and Analytics (HFEA)

Track VI: Analytics-Driven Governance (ADG)

We encourage submissions that offer new insights, novel methodologies, and practical applications in any tracks mentioned above to the international conference SHADG 2024. All submitted papers will undergo a review process, and accepted full papers will be published in the conference proceedings or as a book chapter in an edited book (based on further blind reviews and acceptance) and a few selected papers may be published in international journals of repute, subjected to further blind peer reviews and acceptance.

**CoE-SEA is organizing the conference SHADG 2024 in collaboration with the following:**



- Department of Industrial & Systems Engineering
- Subir Chowdhury School of Quality and Reliability
- Department of Mining Engineering
- Department of Chemical Engineering
- Department of Humanities and Social Sciences



Mary Kay O'Connor  
Process Safety Center



European  
University Cyprus



# Outreach

- 16 weeks certificate course on “*Logistics and Process Safety Engineering (LPSE)*” for the 3<sup>rd</sup> batch of officials from Adani Group is ongoing from September 25, 2023 to February 02, 2024
- One day workshop on ‘*Safety Economics*’ was organized on November 15, 2024 with 31 participants at CoE-SEA seminar hall.



Participants and co-ordinators of ‘Safety Economics’ workshop organized by CoE-SEA

## 16-week certificate course for the officials of Adani Group

CoE-SEA is organizing a 16-week certificate course on “*Logistics and Process Safety Engineering (LPSE)*” for the officials from different business units of Adani Group. The course for the 1<sup>st</sup> batch was successfully completed with 25 participants from the Adani Group, which commenced on August 1, 2022 and ended on November 18, 2022.

The course for 2<sup>nd</sup> batch, spanned from January 16, 2023 to May 12, 2023, was inaugurated by Prof. V K Tewari, Director, IIT Kharagpur, along with Mr. Anil Sardana, MD & CEO (Energy Business), Group Service Head (Safety & BE), Co-Chair, Apex Safety Council, Mr. Birendra Kumar Verma, Joint President & Head of Group Safety, Adani Group and Prof. Debjani Chakraborty, Associate Dean, Outreach, IIT Kharagpur as the guests of honor, on January 16, 2023. The course was concluded with the certificate distribution and valedictory ceremony on May 12, 2023.

The LPSE course for the 3<sup>rd</sup> batch is ongoing, which commenced on September 25, 2023 and will be held for 16 weeks. The course was inaugurated and is being conducted at the CoE-SEA Seminar Room, 2<sup>nd</sup> floor, J C Bose Annex Building, Ramanujan Complex, IIT Kharagpur.



Inauguration of the course on LPSE by the Chief Guest Prof. V K Tewari, Director, IIT Kharagpur



Lamp-lighting ceremony during the inaugural ceremony of the course on LPSE



Mr. Anil Sardana, MD & CEO (Energy Business) Group Service Head (Safety & BE), Co-Chair, Apex Safety Council addressing the gathering during the inaugural ceremony of the course LPSE



## Success story of 2<sup>nd</sup> batch of LPSE

The course was successful in imparting the concepts, principles and procedures of design for safety, integrated safety management, and safety analytics. The sessions were highly interactive and was well appreciated by the participants. The course structure and conduct were appreciated by IIT professors, other academicians, guest lecturers, and Adani leadership.

The course was designed on “Project-Based Learning Methodology (PBLM)” where the participants were given inputs in the classroom through lectures, tabletop exercises, and case studies on various topics like process safety, logistics safety, safety analytics, hazard identification and control, quantitative risk management, micro-hazard mapping and bow-tie management, energy control, Prevention through Design (PtD), ergonomics, etc. These learnings were then implemented at the company sites through project works by the participants with the help of mentors and review by the Course Coordinators.

The project works presented by the participants were submitted to the Adani leadership for taking their recommendations and interventions forward to put to action. The participants’ feedback indicated that they were motivated by the course that they could pursue their career in the field of safety engineering and bring out more analytics driven solutions to improve safety at their workplace.



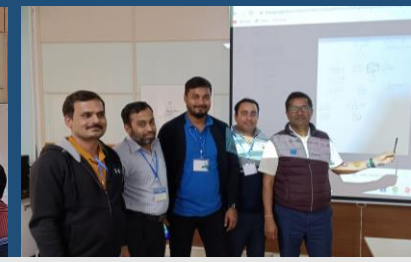
Adani group nominated participants of 2<sup>nd</sup> batch of LPSE along with IIT professors and scholars of CoE-SEA



Participants of 2<sup>nd</sup> batch of LPSE receiving course completion certificate from the Chief Guest of the closing event, Prof. Jayanta Mukhopadhyay, Dean (Outreach), IIT Kharagpur



Participants of 2<sup>nd</sup> batch of LPSE sharing their experience and feedback about the course



Few snapshots during the classroom lectures, group discussions and presentations

# Achievements

- Prof. Jhareswar Maiti is recognized in the 'World's top 2% scientists list by Stanford University' for the year 2023.
- Prof. Jhareswar Maiti was conferred as the 'Outstanding Professor in Occupational Safety & Health' by the Industrial Engineering and Operations Management (IEOM) Society International on 28.12.2023.
- Dr. Richa Ahuja was nominated as a Member for Managed Lanes Committee, Transportation Research Board, NASEM, US, for a second consecutive 3-year tenure.
- Dr. Harshad Hemantrao Shrigondekar was nominated as a nodal officer for IIT Kharagpur as a member of 'India Universities and Institutions Network for Disaster Risk Reduction (IUIINDRR-NIDM)'.

# Invited Talks

- Prof. J Maiti was invited to deliver a speech at the 39<sup>th</sup> DAE Safety and Occupational Health Professionals Meet jointly organized by AERB & UCIL on 28<sup>th</sup> December 2023 on the topic 'Safety analytics for accident prediction and prevention'.
- Dr. O B Krishna was invited for an inaugural speech at the Division level seminar on 'Safety and Health in Steel and Power sectors' organised by Directorate of factories and boilers, Angul Division, Odisha on July 26, 2023.
- Dr. O B Krishna was invited as a session moderator and speaker on the topic 'Leadership Role in Defining ESG Goals' at the 17th edition of Safety Symposium & Exposition 2023 for the Session on "Leadership Role in Defining ESG Goals" scheduled on 22 August 2023 at ITC Sonar, Kolkata.
- Dr. O B Krishna was invited as a guest speaker to the symposium on the theme 'Strategic approach towards safety' organized by the Tata Network Forum (TNF) East on December 22, 2023 at Jamshedpur.
- Dr. Richa Ahuja was invited for an oral presentation at World Road Congress-2023, PIARC, in Prague, Czech Republic and we are honoured that she was the only Indian Academician at the event alongside Indian Government Ministerial Delegates. She presented a research work on the topic "Channelizing global evidence for mainstreaming of resilient road infrastructure through standards".
- Dr. Richa Ahuja was invited as Road Safety Expert for the World Bank and Indian Road Congress workshop towards road safety standards.



Prof. J Maiti receiving the memento for his keynote speech at the 39th DAE Safety and Occupational Health Professionals Meet



Dr. O B Krishna receiving the memento for his inaugural speech at the Division level seminar on 'Safety and Health in Steel and Power sectors'



Dr. Richa Ahuja along with other delegates from World Bank and Indian Road Congress at the workshop for revision on road safety standards



## Key Projects

- AI and virtual reality modeling and collaborative learning of risk and situational awareness in the socio-technical system under disruptions (*DST*).
- Evaluation of District Skill Development Planning (*DSDP*) awards, Ministry of Skill Development and Entrepreneurship (*MSDE*).
- Evaluation of human factors and safety in the submersible platform for acoustic characterization and evaluation, *Naval Physical Oceanographic Laboratory (NPOL), DRDO, Kochi*.
- Centre of Excellence in Safety Engineering and Analytics, (*Institute*).
- Development of prediction-based OSMS and Virtual accident modeling, *Haldia Petrochemicals Limited*.

## Upcoming

- International Conference on ‘*Safety, Health and Analytics-Driven Governance for Sustainable Development (SHADG 2024)*’ on January 29 & 30, 2024 in hybrid mode, venue at IIT Kharagpur.
- 6 months certificate course on “*Industrial and Fire Safety Engineering and Management for the officials of Indian Armed Forces*” will commence from February 2024.

## Our New Faculties

Two new faculty members have joined the Centre as Assistant Professor Grade – II. They are developing two verticals of CoE-SEA: Transportation Safety and Fire Safety

### Dr. Harshad Hemantrao Shrigondekar

Ph.D., Fire Safety, IIT Bombay

Research areas: Fire Safety Engineering; Experimental Heat Transfer & Fluid Dynamics; Safety Engineering, Management, & Analytics; Spray Dynamics; Engineering Education



### Dr. Richa Ahuja

Ph.D., Transportation Safety, IIT Delhi

Research areas: Transportation Safety, Emergency Response Systems, AI, ML, Cognitive Science; Transport Resilience & Sustainability; Logistics Safety; Spatial Informatics, Traffic Management



## Publication Watch

- Forecasting occupational safety performance and mining text-based association rules for incident occurrences  
<https://doi.org/10.1016/j.ssci.2022.106014>
- Machine Learning and Data Analysis Based Breast Cancer Classification  
*In Machine Learning Algorithms and Applications in Engineering* (pp. 117-129). CRC Press
- A Comparative Study of Distance-Based Clustering Algorithms in Fuzzy Failure Modes and Effects Analysis  
DOI: [10.1007/978-981-99-1414-2\\_45](https://doi.org/10.1007/978-981-99-1414-2_45)
- An integrated approach using rough set theory, ANFIS, and Z-number in occupational risk prediction  
<https://doi.org/10.1016/j.engappai.2022.105515>
- Effective fall detection and post-fall breath rate tracking using a low-cost CW Doppler radar sensor  
<https://doi.org/10.1016/j.combiomed.2023.107315>
- A Novel Graph Neural Network based Approach for Human Activity Recognition  
<https://doi.org/10.23919/EUSIPCO58844.2023.10289905>
- Influence of inclined unconfined circular air jet impingement on local heat transfer characteristics of smooth flat plate  
<https://doi.org/10.1016/j.ijthermalsci.2023.108848>

## Reach us

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