

ABOUT THE WORKSHOP

This workshop focuses on applying AI techniques to process and analyse biomedical signals (ECG, EEG, PCG) and medical images (MRI, CT scans, ultrasound). Participants will engage in hands-on projects, learning advanced topics like neural networks, transfer learning, and regularisation. By the end, they will have practical experience in building deep learning models, making the course valuable for beginners and professionals seeking to master the fundamentals of deep learning for real-world data analysis.

COURSE OBJECTIVE

Understand the Fundamentals of Biomedical Signal and Image Processing: Equip students with a solid understanding of the key concepts of ECG, PGC, Lung Sounds, and MRI images.

AI Techniques for Digital Healthcare: Enable students to explore and implement ML and DL algorithms to classify and analyse biomedical signals and images.

Develop Skills in Preprocessing and Denoising Biomedical Signals and Images: Teach students effective preprocessing techniques, including noise reduction, normalisation, and artefact removal, to enhance the quality and interpretability of biomedical data for AI applications.

Design AI-based Solutions for Real-world Biomedical Challenges: Guide students in developing AI-driven solutions to real-world problems in healthcare.

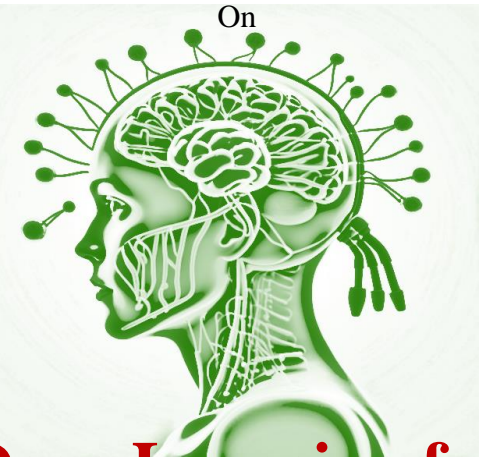
COURSE CONTENT

- 1. Introduction to Biomedical Signal and Image Processing:** Provide an overview of common biomedical signals (ECG, EEG, PCG, etc.) and medical imaging modalities (MRI, CT, X-ray, ultrasound) used in clinical practice.
- 2. AI Techniques in Biomedical Signal Processing**
Explore how AI techniques like machine learning, deep learning, and neural networks are being applied to process complex signals like ECG, EEG, and SCG.
Discuss applications in signal noise reduction, feature extraction, and classification to improve the accuracy of medical diagnoses.
- 3. AI for Medical Image Processing:** Highlight the use of AI, particularly deep learning models for image segmentation, enhancement, and classification.
- 4. Challenges and Limitations of AI in Healthcare:** Address the challenges related to AI implementation, including the need for high-quality labelled data, training on diverse datasets, and ensuring the generalisation of AI models across patient populations.
- 5. Hands-on Sessions:** Offer practical sessions where participants can learn how to apply AI models to biomedical signal datasets and medical images using platforms such as Python, TensorFlow, or MATLAB.



Department of Computer Science and
Engineering
**National Institute of Technology
Rourkela**

Short-term Course



**Deep Learning for
Healthcare**

(DLH-2025)

(Hybrid Mode)

02nd–06th June 2025

Chairman

Prof. Bibhudutta Sahoo, HoD (CS)

Convener

Dr. Puneet Kumar Jain

ABOUT NIT ROURKELA

National Institute of Technology (NIT) Rourkela is an institution of national importance funded by the Ministry of Education. NIT Rourkela was established as Regional Engineering College (REC) on August 15, 1961. In India, it was ranked 19th among engineering colleges by the National Institutional Ranking Framework (NIRF) in 2024. For details about the institute, please visit us at www.nitrkl.ac.in.



ABOUT DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Department of Computer Science & Engineering, NIT Rourkela, was established in 1982. Since its inception, the Department has been under dynamic progress and has been able to develop a reputation for imparting quality education both in undergraduate and graduate programs. The department also offers Ph. D. for regular and sponsored candidates. Please visit <https://website.nitrkl.ac.in/CS/> to learn more about the Department of CSE. The department has well-equipped modern laboratories such as Software Engineering, Distributed Object Systems, Information Security & Data Communication, Image Processing & Cluster Computing and Advanced Database Engineering Labs for pursuing research while keeping in view of technological advancement.



TARGET PARTICIPANTS

The short-term course is of immense interest for UG/ PG students, research scholars/professionals, staff/ faculty members and industry professionals working in the area of Data Science. The participants from different Science and Engineering (Computer Science and Engineering, Electronics and Communication Engineering, Electrical Engineering, etc.) background will be benefitted with this course.

IMPORTANT DATES

Registration Starts	01st March 2025
Registration Ends	31st April 2025
Maximum Offline Participants (First Come First Serve Basis)	60
Registration Confirmation	01st May 2025
Course Schedule	02-06th June 2025

PREREQUISITES

1. The offline participants should bring their laptop.
2. Basics of programming language and data structure will be a plus.

TOURIST PLACES NEARBY



Khandadhar Waterfall



Pitamahal Dam



Vedvyas Temple



Mandira Dam

REGISTRATION & FEE PARTICULARS

Registration Fee

Students	Rs. 1180/- (online) Rs. 2,360/- (offline)
Faculty from Academic Institutions	Rs. 2,360/-
Employees from Industry and R&D Organizations	Rs. 2,360/-

Accommodation Charges

Guest house (South / North block) Hostel (for students)	As Per Institute Norms
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(Lodging, boarding, lunch and dinner facility can be availed on separate payment basis and based on availability.)

BANK ACCOUNT DETAILS FOR REGISTRATION

Account Name:	CONTINUING EDUCATION NIT ROURKELA
Account No.:	10138951784
Bank Name	State Bank of India (002109)
Branch:	NIT Rourkela Campus
IFSC Code	SBIN0002109

REGISTRATION FORM

To complete the online registration, the participants need to fill the following google form:
[Click here for the Google Form Registration Link](#)

Patron	Prof. K. Umamaheswar Rao, Director, NIT Rourkela
Chairman	Prof. Bibhudatta Sahoo
Convener	Dr. Puneet Kumar Jain

Correspondence

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STUDENT COORDINATORS

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