

About the Institute

National Institute of Technology (NIT) Rourkela is an institution of national importance funded by Ministry of Human Resource Development. It is one of the premier national level institutions for technical education in the country. The main objective of the institute is to produce quality engineers and scientists in graduate, post-graduate and doctoral levels in various branches of Engineering and Science. NIT Rourkela was 13th among engineering colleges by the National Institutional Ranking Framework (NIRF) in 2025. For details about the institute please visit us at www.nitrkl.ac.in



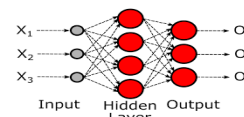
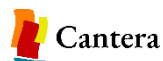
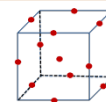
About the Department

The Department of Civil Engineering started its journey in 1961. Ever since the inception, it has been imparting quality education to under graduate students. The department presently fosters six PG courses. There are well established laboratories with various research and testing facilities. The faculty consists of eminent specialists from diverse fields and there is commendable research ambience in the department.

Course Overview

This **5-day short-term course** offers an integrated introduction to contemporary approaches in Environmental Engineering, combining sustainability-focused technologies, computational tools, and modern analytical methodologies. The course provides balanced coverage of carbon capture and emission mitigation techniques, GIS applications in water resources and environmental analysis, fundamentals of combustion and reacting system modeling, Life Cycle Analysis (LCA) for environmental impact assessment, and advanced data-driven methods such as Response Surface Methodology and Artificial Neural Networks for process optimization and predictive modeling. The program blends theoretical understanding with practical exposure to experimental setups, geospatial platforms, modeling tools, and analytical techniques relevant to present-day environmental challenges.

Through guided sessions, participants will be engaged in carbon capture experimentation and adsorption analysis, spatial environmental data interpretation, reactor modeling and simulation, life cycle assessment studies, and optimization using statistical and AI-based techniques. By the end of the course, participants will be able to apply computational and analytical approaches to environmental problems, interpret experimental and modeling results effectively, and develop sustainable engineering solutions with enhanced predictive capability and informed decision-making skills.



Five days Short Term Course (Online mode)

on

Applied Computational Tools for Sustainable Environmental Engineering

April 18th – 22th, 2026



Patron

Prof. K. Umamaheshwar Rao
Hon'ble Director, NIT Rourkela

Chairman

Prof. Suresh Prasad Singh
Head & Professor
Department of Civil Engineering
NIT Rourkela

Coordinators

Dr. Prateeksha Mahamallik
Dr. Rakhee Das
Dr. Raviteja Kurapati

Organised by

Department of Civil Engineering
National Institute of Technology
Rourkela
Rourkela -769008
Odisha, India

Course Objectives

- Introduce computational methods in environmental engineering applications
- Develop practical skills in GIS, modelling, and environmental data analysis
- Enhance understanding of sustainable engineering solutions
- Provide hands-on exposure to modern environmental computational tools

Important Dates

Registration Deadline 12th April 2026

Confirmation to Participants through Email 13th April 2026

Commencement of Course 18th April 2026 (Online)

Who should attend ?

- Faculty members of Engineering/Science institutions
- Research scholars and postgraduate students
- Industry professionals in environmental and related sectors
- Participants interested in computational environmental applications

E-certificates will be provided to participants who successfully complete the course.

Course Outline

Day-1

- *Theory: Fundamentals of carbon capture and environmental significance., sources of CO₂ emissions, carbon capture technologies, CO₂ capture using adsorption techniques.*

- *Key Learning : Demonstration of experimental setup for CO₂ capture and adsorption/desorption analysis, measurement of capture capture, data analysis and interpretation for carbon capture experiments.*

Day-2

- *Theory: Applications of GIS in Water Resources and Environmental Engineering*
- *Key Learning : Introduction to Google Earth Engine and GIS platforms such as QGIS/ArcGIS for environmental data visualization and spatial analysis.*

Day-3

- *Theory: Fundamentals of combustion, Thermodynamics of Reacting Systems, Chemical Kinetics concepts, Modelling of Batch Reactor and CSTR*
- *Key Learning : Modelling and simulation of reactor for environmental applications using Cantera(Python Library)*

Day-4

- *Life Cycle Analysis: systematic method to evaluate the environmental impacts of a product or process across all stages; from raw material extraction to disposal*
- *Key Learning: Holistic perspective, sustainability choices, systematic and transparent environmental evaluation*

Day-5

- *Response Surface Methodology: statistical and mathematical technique used to model and optimize processes by fitting polynomial equations to experimental data*
- *Artificial Neural Network: computational model to learn non-linear relationship from data through training*
- *Key learning: interaction between variables, process optimization, high predictive accuracy*

Registration Form

Name:

Designation :

Organization:

Address for Correspondence:

E-mail:

Phone:

Particulars of Registration Fee

DD/Transaction ID:

Date:

Amount:

Bank:

Branch:

Link for online registration:

<https://forms.gle/g1J8gNYcQz5XxmbeA>

Registration Type	Fees (incl. GST)
Student	INR 500
Faculty Members	INR 1000
Scientist from R&D	INR 2000
Organization/Industry Others	

Account Details

Bank Account Details for Registration:

Account number: 10138951784

Account name: Continuing Education, NIT Rourkela

Bank name: State Bank of India (SBI)

Branch name: NIT Rourkela campus

IFSC code: SBIN0002109

UPI ID: 01389517841@sbi
Merchant Name: Continuing Education NIT



Participants from NITRKL are exempted from paying registration fees.

Address for Communication

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