



A Five-Day Workshop on
ENVIRONOMETRICS using AI & ML

15th December – 19th December 2025

[Hybrid Mode]



Organised by
Department of Humanities and Social Sciences
National Institute of Technology Rourkela

Information Brochure

About the Program

ENVIRONOMETRICS merges two significant disciplines – Environmental Economics and Applied Econometrics. It basically uses research methods of mathematical statistics to understand the economic aspects of environmental issues using the Artificial Intelligence (AI) and Machine Learning (ML) techniques. This program aims to provide frameworks to optimize the use of natural resources, impact assessments of environmental changes, such as climate change, and evaluate environmental regulations. Datasets may not be limited to include only air, water quality measurements, GHG emissions, energy consumption statistics and economic parameters like national income, employment and market valuations. It will encompass cross-section, time series and panel modeling along with spatial analysis, endogeneity redress to tackle complex environment and economy trade-off. Environmental variables, by their nature being characterized by spatial and temporal structure, are subject to verifications of measurement errors, missing observations, functional misfits, diagnostic checks for their reliability and that is why they need sophisticated treatments with advanced research tools used in AI and ML. The workshop will redefine the field of investigation through critical enquiry, interdisciplinary integration, advanced causal inference methods and discourse complex challenges from local to global.

Objective of the Workshop

The Short-term Course aims to provide researchers with the necessary skills to apply environmental data and econometric techniques with advanced computational software practices effectively used in the dynamic fields of Economics and other branches of Social Sciences, emphasizing the importance of data-driven decision-making for impactful policymaking. This training program will aim:

1. Through hands-on sessions and applications to recent databases, the workshop will cover fundamental, intermediate and advanced modelling techniques and modus operandi of multi-media, cross-section, time series and panel data analysis.
2. Researchers in this field, including those in academia, industries, research bodies, and Government agencies will have a solid understanding of the econometric techniques best suited for analysis of environmental data.
3. To introduce participants to the major databases in Ecological Economics, Natural Resource Management and Environmental Economics and other similar Social Science research, EPA, NOAA, USGS, UNEP, EEA, World Bank, IUCN, WRI, EDI, OGC, ecoinvent etc.

Broad overview of the course

Module I:	Carbon, Ecological Footprint and GHG Emissions Analysis
Module II:	Energy Consumption, Efficiency, and Transition
Module III:	Environmental Policy, Regulation, and Institutional Quality
Module IV:	Climate Risk, Energy Security, and Load Shedding
Module V:	Data Visualization and Quantitative Impact Evaluation for Sustainability and Environment Protection Programs

Detailed Syllabus*:

- A) Cross-sectional Data Analysis (CSDA): Beyond OLS, Discrete Dependent and Independent Variable Regression, Quantile Regression (emissions inequality), STIRPAT model, Structural Equation Modelling (SEM).
- B) Time-Series Data Analysis (TSDA): Introducing Dynamics, Multivariate Time Series Models, Testing for Non-stationarity, Modelling Non-stationary Variables, Structural and Non-linear Time-series Models, Forecasting (Environmental Kuznets Curve testing, energy–growth–emissions dynamics), GARCH family models (volatility in energy prices),
- C) Panel Data Analysis (PDA): Fixed and Random Effects, Panel Cointegration (Pedroni, Kao, Westerlund), Panel ARDL (PMG, MG, DFE) (energy—growth—environment—emissions nexus), FMOLS / DOLS (long-run equilibrium), IV Regression Techniques and Generalized Methods of Moments, Panel Threshold Regression (income or energy as thresholds), Heterogeneous Panel Causality.
- D) Miscellaneous Environmental Econometrics Analysis (MEEA): DEA and SFA (efficiency estimation), Club Convergence Analysis, Spatial Panel Models for energy, and regional spill overs, and to capture regional dependence, Difference-in-Differences (DID), Regression Discontinuity Design (RDD).

**Completion of the entire syllabus is subject to time constraints. 100% efforts can be assured to complete it.*

Participants

The short-term course is of immense interest for UG/PG students, research scholars/professionals, staff/ faculty members in the state / central universities and colleges and industry professionals working in the area of Environmental Economics and Applied Econometrics in Climate Change, Ecological Economics, Natural Resource Management. Maximum of 80 participants in total (20 in physical / offline mode and 60 in online mode of participation). Participants are requested to bring their own laptops for the practical sessions and research practice. Prior working knowledge in some of the statistical or econometrics software is recommended. However, foundation level knowledge of basic statistics and/or econometrics is essential.

Resource persons

Eminent and accomplished faculty members from premier institutions in India and faculty members of NIT Rourkela (including HS, CE, CS and EA Departments) will deliver the lectures, followed by interactive sessions and hands – on training on the subject.

Hospitality

Limited accommodation facilities for a 5-day ENVIRONOMETRICS workshop is available at the NITR campus Hostels and can be availed on a payment basis. The facility would be provided at first come first serve. Below is the Hostel room tariff. **Payment for accommodation can be done upon arrival**

- Approx. INR 200/- (per day per person in a 2-seater room)
- Approx. INR 450/- (per day per person- single room)

Certification

Certificates of completion will be given to the registered participants after successful completion of the course. Full attendance is compulsory for the participation certificates.

How to reach NIT Rourkela

En route Howrah-Mumbai main line of South Eastern Railway, the city is well connected to all major cities of India by railway network and inter- and intra-state bus services. It takes around 2 hours from Jharsuguda, 6 hours from Kolkata and around 3 hours from Ranchi airport by train. Rourkela railway station is approximately 6 kms from NIT Campus. Rourkela airport is also functional, with connecting flights available to and from Bhubaneswar and Kolkata.

Registration fee

There is Rs 2500/- registration fee for online participants of this Environometrics workshop. The offline participants have to pay Rs. 3500/- (if Research Scholars), Rs. 4000 (if faculty members) and Rs. 5000/- (if participant is from corporates or industries). The offline participants will be provided food (breakfast, lunch and dinner in the hostel mess) and local conveyances (add and drop twice from hostel to workshop venue).

Venue

It is primarily the Department of Humanities and Social Sciences, NIT Rourkela. The classes will be held at the CSE Department Laboratory.

About NIT Rourkela

National Institute of Technology Rourkela, an institute of national importance, is one of the premier national level institutions for technical education in the country and is funded by the Government of India. With a vision to become an internationally acclaimed institution of higher learning that will serve as a source of knowledge and expertise for the society and be a preferred destination for undergraduate and graduate studies, NIT Rourkela has been constantly striving to serve the society since its very inception in 1961. At present, it ranks #317 in QS ASIA University Rankings (2025), 30 in NIRF Research (2025), and is steadily progressing to achieve all the epitomes of world level recognitions.

About the Department

The Department of Humanities and Social Sciences has been functioning as a full-fledged department catering to both undergraduate and postgraduate students. The faculty has wide experience in teaching and research and in communicating with students of diverse backgrounds. The Department offers a full-time PhD program in the disciplines of Economics, Anthropology, Sociology, Psychology, and English; an MA Program in Development Studies; and also offers compulsory open electives to undergraduate and postgraduate students of the institute.

Important dates

- Duration of the workshop:
15 December 2025 (Monday) – 19 December 2025 (Friday)
- Last date to receive applications from participants:
28 November 2025 (5.00 PM)
- Confirmation to selected candidates:
29 November 2025
- Confirmation from participants along with the payment receipt:
02 December 2025

The Registration Fee can be paid to following bank account.

Bank Name	:	State Bank of India
Branch	:	NIT Rourkela
Branch Address	:	NIT Rourkela, Rourkela 769008
Account Number	:	10138951784
IFSC Code	:	SBIN0002109
Account name	:	CONTINUING EDUCATION NIT ROURLKELA
MICR Code	:	769002007
SWIFT Code	:	SBININBBI37

Organizing Committee

Chief Patron

Prof. K. Umamaheswar Rao,
Director, National Institute of Technology Rourkela, Odisha

Chairperson

Prof. Jalandhar Pradhan,
Professor and Head, Department of Humanities and Social Sciences
National Institute of Technology Rourkela, Odisha

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Associate Professor, Department of Humanities and Social Sciences
National Institute of Technology Rourkela, Odisha

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Assistant Professor, Department of Computer Sciences
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Dr. Sibarama Panigrahi
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APPLICATION FORM

(Please fill the form in Capital Letters and strike out whichever is not applicable)

1. Full Name:
2. Gender:
3. Date of Birth:
4. Correspondence Address:
5. Email:
6. Mobile/Phone:
7. Highest Educational Degree/highest qualification:
8. Position held:
9. Name of the University/Institute/College:
10. Discipline/Subject:
11. Are you familiar with any basic statistics/econometrics? Yes/No
12. Are you familiar with any AI or ML tool or techniques? Yes/No
13. Have you attached a CV (max 3 pages) along with the publication details? Yes/No
14. Accommodation Required (in Hostels and on payment basis): Yes/No

Declaration:

I hereby declare that the above information is true to the best of my knowledge and belief.

Date:

Signature of the Applicant

Recommended by:

Name and

Designation:

Organisation:

Signature: