Five Day National Workshop on

# Computational Tools in Urban Planning

## During 9<sup>th</sup> June to 13<sup>th</sup> June, 2025 [Online Mode]





Department of Planning and Architecture National Institute of Technology Rourkela, Odisha – 769008

## ELIGIBILITY

The workshop is open for faculty members, research scholars, UG/ PG students, Industry professionals, and student/ faculty/ staff members of NIT Rourkela, interested/ associated with the domain of urban planning or allied fields of study.

## **REGISTRATION DETAILS**

## **Registration Fee (Including GST)**

Rs. 1200/- (Rupees One thousand and two hundred only)

• No registration fee for any staff/ student of NIT Rourkela

### **Registration process**

Registration fees is to be paid in online mode in favor of: Account Name: Continuing Education, NIT Rourkela Bank name: State Bank of India (SBI) Branch name: NIT Rourkela Campus Account No.: 10138951784 IFSC Code: SBIN0002109

Either options can be opted for the **registration process:** Option1: Google form (https://forms.gle/ZWx1r6T9mjb59FEQ6) to be filled up and

payment details along with a copy of payment receipt\* to be provided in the form, by interested participants.

#### OR

## Option 2:

Interested participants may send a scanned filled up copy of the Registration Form along with a copy of the payment receipt\* through e-mail to sahasu@nitrkl.ac.in or baghela@nitrkl.ac.in.

## \*Payment details not required for staff/ students of NIT Rourkela

#### Please Note

- Incomplete registration-form (without proof/ details of online transaction) will not be considered.
- Registration fee is non-refundable.
- E-Certificate will be provided for the candidates attending all the sessions, including the MCQ test.
- There is no registration fee for any staff/ student of NIT Rourkela.
- Online joining link(s) through *Google-meet/ MS-Team* will be shared in due course.

Last Date of Online Registration: June 2, 2025

Patron Prof. K Umamaheshwar Rao Director, NIT Rourkela

> **Co-Patron**  *Prof. Swadesh Kumar Pratihar* Dean (SRICCE), NIT Rourkela

#### Chairman Dr. Soumi Muhuri

Head, Department of Planning and Architecture, NIT Rourkela

## **Principal Coordinator**

Dr. Suparna Saha Assistant Professor Department of Planning and Architecture, NIT Rourkela sahasu@nitrkl.ac.in

#### Coordinator Ankur Baghel

Assistant Professor Department of Planning and Architecture, NIT Rourkela baghela@nitrkl.ac.in

### **Student Coordinators**

Varun Kathuria Padmaja Chakravarty Gaurav Kumar Besra (Ph.D. students, NIT Rourkela)

## **ABOUT THE INSTITUTE**

National Institute of Technology Rourkela is one of the premier national level institutions for technical education in the country. The Government of India had elevated the Regional Engineering College, Rourkela to a university under the name of National Institute of Technology, Rourkela. NIT Rourkela is a highly prestigious institute with a reputation for excellence in research, consultancy and education at undergraduate, postgraduate and doctoral levels. The Institute offers distinct programs across various disciplines in order to meet the demands of contemporary times.

The institute strives to become an internationally acclaimed institution of higher learning that shall serve as a centre for knowledge and expertise for the society. With varied inclusive initiatives and the introduction of a standardized education policy, over the years, the Institute's graduates have been great performers at professional fronts across the world.

## **ABOUT THE DEPTARTMENT**

The Department of Planning and Architecture (PA) was established in 2013 with the objective of amalgamating the aesthetics and technology together into a piece of art, in a creative way, not only to fulfil the societal need of shelter and to solve the infrastructure problem but also to take care of the emerging concern of energy and environmental issues. The department is providing multidisciplinary research and teaching programs in the field of architecture and planning. The faculty members have diverse research interests and they conduct basic and applied research in the area of Sustainable Architecture, Energy Efficient Architecture, Green Architecture, Acoustics, Illumination, Landscape Architecture, Interior Design, Urban Planning, Transportation Planning, Infrastructure Planning, Environmental Planning and Housing.

## **ABOUT THE WORKSHOP**

The recent advances in the field of urban planning have contributed to a significant transformation in approaches to problem solving, along with an upsurge in research studies that are evolving new approaches and methods to deal with the management and design of cities. Computational tools, combining the knowledge of multidisciplinary fields of mathematics and computer sciences with civil engineering, transportation, economics, energy engineering, environmental sciences, ecology, and sociology, are aiding in the development of solutions that can help cities to adapt to the evolving needs of the modern society.

Technological tools and software can help in the representation and understanding, as well as in the analysis, evaluation, and development of solutions for urban studies. With the rise in complexities of urban planning problems, the evolution of the needs and requirements of the society, the need for use of tools both for qualitative and quantitative studies, such as Analytical Hierarchical Process (AHP), Quantitative content analysis, Structural Equation Modelling and programming languages such as Python, R, etc. are increasing.

Broad workshop outcomes

- Gain knowledge about the computational tools used in solving urban planning problems.
- Develop an understanding of tools such as Quantitative Content Analysis, Analytical Hierarchical Process (AHP) for Environmental Impact Assessment and other urban planning applications, and Structural Equation Modelling.
- Develop an understanding of the use of programming languages such as **R** and Python and their application in urban planning.
- Explore and experience hands-on training sessions on R, Python, and Structural Equation Modelling.

#### List of speakers Dr. Shreya Banerjee **Prof. Debapratim Pandit** Dr. Roshmi Sen Assistant Professor Professor Assistant Professor Sustainable Urban Planning Group Department of Architecture and Regional Department of Planning and Center for Emerging Technologies for Planning Architecture IIT Kharagpur Sustainable Development NIT Rourkela IIT Jodhpur Mr. Annam Sai Kiran Dr. Suparna Saha Dr. Bikash Ranjan Mishra Assistant Professor Associate Professor Lecturer School of Human Settlements Department of Humanities and Social Department of Planning and XIM University, Bhubaneswar Architecture Sciences

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## WORKSHOP SCHEDULE

	Date				
Day 1	09.06.2025	08:00 - 09:00	Inauguration		
			Introduction to the workshop	1	
			Break	1	
		Time	Session details	Speakers	Session outline
		duration			
		09:00 - 12:00	Data analysis with R Programming (lecture and instruction)	Dr. Shreya Banerjee	This module will look into how R Studio and R programming can be used for quantitative data
				Assistant Professor	analytics related to urban studies, data types, descriptive and inferential statistics, and basic
		12:00-14:00	Lunch break	Sustainable Urban Planning Group	prediction modelling. Further, this module will look into how to generate effective graphs, plots
		14:00 - 17:00	Data analysis with R Programming	Center for Emerging Technologies for	and charts for visualization.
			(hands-on training: instruction and assignment)	Sustainable Development	
		17:00 - 17:30	Compilation of work output from sessions of Day 1	IIT Jodhpur	
Day 2	10.06.2025	09:00 - 12:00	Introduction to Python for Urban Planning (lecture and instruction)	Mr. Annam Sai Kiran	Participants will gain hands-on experience in using Python for basic data analysis and GIS
		12:00-14:00	Lunch break	Lecturer	integration, building a strong foundation for applying advanced techniques like machine learning
		14:00 - 17:00	Introduction to Python for Lirban Planning (hands-on training: instruction and	School of Human Settlements	to solve real-world urban planning challenges
		11100 11100	assignment)	XIM University, Bhubaneswar	
		17:00 - 17:30	Compilation of work output from sessions of Day 2	4	
Day 3	11.06.2025	09:00 - 12:00	ML with Python for urban applications (lecture and instruction)	Prof. Debapratim Pandit	Machine learning (ML) is increasingly being applied in both urban planning and design,
		12:00-14:00	Lunch break	Professor	particularly for optimizing and improving the development and day to day operation of urban
		14:00 - 17:00	MI with Python for urban applications (hands-on training: instruction and	Department of Architecture and Regional	areas. This session will explore the foundational basics, broad categories of machine learning
		14.00 - 17.00	assignment)	Planning	techniques and specific examples from the urban planning domain where we try to develop
		17:00 - 17:30	Compilation of work output from sessions of Day 3	IIT Kharagpur	predictive models using specific machine learning algorithms and approaches.
				assisted by Natasha Saraswati and Swaraj	
				Bose	
Day 4	12.06.2025	09:00 - 12:00	Structural Equation Modelling (lecture and instruction)	Dr. Bikash Ranjan Mishra	Structural Equation Modelling (SEM) is a multivariate technique used in Health care, Education,
				Associate Professor	Social Sciences, Business studies and analysis related to planning and architecture. SEM is a
		12:00-14:00	Lunch break	Department of Humanities and Social	powerful tool for testing and estimating causal relationships between variables, both
		14:00 - 17:00	Structural Equation Modelling (hands-on training: instruction and assignment)	Sciences	observed and latent. This session will explore the application of SEM in urban studies.
				NIT Rourkela	
		17:00 - 17:30	Compilation of work output from sessions of Day 4	assisted by Akshita Patnaik and Ankit	
				Mohapatra	
Day 5	13.06.2025	09:30 - 12:30	Analytical Hierarchical Process (AHP) for Environmental	Dr. Roshmi Sen	This module will train the attendees about methodology of the computational tool AHP and how
			Impact Assessment and other Urban Planning Applications	Assistant Professor	to conduct an AHP on problems that have application in urban and environmental
			(lecture, instruction and assignment)	Department of Planning and Architecture	planning problems.
				NIT Rourkela	
		12:30-13:30	Lunch break		
		13:30-16:30	Introduction to Quantitative content analysis (lecture, instruction	Dr. Suparna Saha	This module will introduce participants to quantitative content analysis, the use of the same in
			and assignment)	Assistant Professor	research related to urban studies and the application process.
				Department of Planning and Architecture	
		16.00 17.00		N11 Rourkela	
		16:30 - 17:00	Compliation of work output from Day 1 - Day 5		
		17:30-18:30	Online test dased on MCQs		
		18:50 - 19:00	Online reedback submission by participants		

#### Workshop

**On** Computational Tools in Urban Planning (Online Mode)

> 9th June – 13th June 2025 Department of Planning and Architecture National Institute of Technology Rourkela, Odisha-769008

#### **REGISTRATION FORM**

## **PARTICIPANT DETAILS**

Name (in BLOCK LETTERS)

Designation

Department

Organisation

**Email address** 

Phone number (preferably

WhatsApp number)

## **PAYMENT DETAILS**

**Transaction Reference Number** 

Date of payment

**Bank/ Branch details** 

Amount paid

Signature of participant: Date:

For staff/ students of NIT Rourkela, mention NA in the payment details