

स्वत्तेव प्रत्ने शिक्षा मंत्रालय MINISTRY OF EDUCATION GOVERNMENT OF INDIA



राष्ट्रीय प्रौद्योगिकी संस्थान पटना

National Institute of Technology Patna

An Institute of National Importance under Ministry of Education (Shiksha Mantralaya), Government of India

Heat Stress

Climate adaptation in different spatial and temporal scales



28th July – 1st August 2025



Patron Prof. Pradeep Kumar Jain Director, NIT Patna

Course Coordinator

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Organized By : Department of Architecture & Planning National Institute of Technology Patna https://www.nitp.ac.in/Department/Archi

National Institute of Technology Patna

National Institute of Technology (NIT) Patna is the 18th NIT created by the Ministry of H.R.D., Government of India after rechristening the erstwhile Bihar College of Engineering Patna on January 28, 2004. NIT Patna marked its humble beginning in 1886 with the establishment of pleaders survey training school which was subsequently promoted of Bihar College of Engineering Patna in 1924, which made this institute the 6th oldest Engineering Institute of India. The graduate level curriculum was initiated in 1979, which was elevated to the post-graduate level in 2012. Ph.D. commenced in the department in 2009. The institute is situated on the south bank of holy river Ganges behind Gandhi Ghat, one of the most important and reverential place of Patna. The Gandhi Ghat is associated with the Immersion of ashes of father of the Nation Mahatma Gandhi in the river Ganges. The campus has a picturesque river view with its historic main building presenting a spectacle of architectural delight and natural beauty.

National Institute of Technology Patna has been declared as an institute of National Importance and has been granted a fully Autonomous Status by MHRD, Government of India. The Institute has also been declared as a Centre of Excellence of impart high level education training, research and development in science, engineering technology and humanities. It is imparting high quality education & values at UG (B.Arch/B.Tech), PG (M.Arch/MURP/M.Tech) and Ph.D. programmes through its experienced faculty well versed in their respective field of engineering an technology with well equipped laboratories. At present the Institute has ten disciplines – Architecture and Planning, Chemical Engineering and Technology, Civil Engineering, Compute Science and Engineering, Electrical Engineering and Mechanical Engineering, and well established departments of Physics, Mathematics and Humanities and Social Science.

National Institute of Technology Patna aims at setting out very high education standards and holds long record of academic excellence. The pedagogical aspects have been formulated to suit not only the needs of the contemporary Industrial requirements but also to develop human potential to its fullest extent in a range of professions. Extra curricular activities are planed through games and sports, cultural programmes and NSS activities. Cultural activities provide a platform to know about the culture of various states and regions of the country and opportunity for national integration.

Ever since its rechristening, NIT Patna has been on the fast track of development and has undergone. numerous facelifts because of which placement records have witnessed unprecedented growth and is touching new heights as the graph of placement is increasing remarkably.

Department of Architecture and Planning

The Department of Architecture was established in Bihar College of Engineering (BCE) Patna in the year 1979 under Patna University. It was the first time that architectural education had commenced in Bihar. When BCE Patna was rechristened as National Institute of Technology Patna on January 28, 2004, it came under the control of Ministry of Human Resource Development (MHRD), Government of India. The Department of Architecture and Planning offers programmes in Bachelor of Architecture (B.Arch.), Master of Urban and Regional Planning (MURP), Master of Architecture (Sustainable Architecture) and Ph.D. in Architecture and Planning.

The B. Arch. course, apart from fulfilling the functional requirements, leads towards creativity, innovation and aesthetics in the approach for design of buildings and its environments. The post-graduate course in Master of Urban and Regional Planning, which commenced from 2012-13, imparts knowledge of urban and regional planning, green infrastructure, environment planning, sustainability and energy efficient aspects in urban and regional planning. It emphasizes on creating new ideas and innovative concepts of physical/spatial planning in the present scenario. The nomenclature of Department of Architecture was changed to Department of Architecture and Planning in the year 2020. This course is affiliated by Institute of Town Planners, India.

The M. Arch. programme stated in 2019-2020, the nomenclature of this post graduate programme was changed to Master of Architecture (Sustainable Architecture) from session 2022-23. The Course content focused more on environmental issues related to built environment, ecology, energy conscious built structure, artificial intelligence, building simulation and different means of passive architectural methods. The Ph.D. programme started in year 2009 with research areas in Architecture, Urban Planning, Regional Planning, Environmental Planning, Transport Planning, Architectural Conservation, Landscape, Housing, Healthcare Architecture and Construction Planning Management, etc.

Course Overview

Heat is one of the most important adaptations possibilities, which will not only be helpful for the reduction of mortality and morbidity but also an issue in term of work productivity and in general for quality of life worldwide. Climate change is mostly visible and eminent in cities, because of the high density of population and action taken are not only as adaptation but also for mitigation. For the guantification of heat and heat stress, methods from urban climatology and human biometeorology can provide results and information which can be directly applied for combatting/assessing climate impact and for the development of strategies and action against heat. Heat action plans are a comprehensive tool, which focuses on short-, medium-, and long-term goals/aims and are relevant for the protection of vulnerable and risk groups. They consider factors, such as coordination and responsibilities of the plans, heat health early warning system, information ways and plans, possibilities of reduction of indoor heat, specific actions for the protection of vulnerable people (mostly elderly), education options for health sectors, urban planning options for reduction of heat and finally the monitoring of actions and their evaluation. The mitigation of heat and the implication on human health bring several disciplines together and the application and implementation of actions require scientific results and analysis based not only on measurements but also the application of micro scale models, under consideration for validation of results. In addition, the knowledge of quantification of heat implications and the use of heat health warning systems are crucial for the protection of human life from extreme heat and heat waves.



Course Objectives

- Understanding of implications of extreme heat and heat stress.
- Understanding of human biometeorological assessment of urban heat islands during extreme heat.
- Human energy balance and thermal indices, micro scale models, heat health warning systems.
- Worldwide and regional examples are how to mitigate and adapt to extreme heat.
- **4** Creation and configuration of open spaces, heat action plans.

Topics to be covered during the course

- Urban climate and formation of urban heat islands
- Basics of human biometeorology
- Human energy balance
- Thermal indices
- RayMan model
- SkyHelios model
- Heat health warning systems
- Heat action plans
- Urban bioclimate examples worldwide
- Climate change and human health

- Importance of climate adaptation in urban areas and health sectors and how to apply
- Calculations and simulations with RayMan model (sunshine duration, thermal indices for long term data)
- Calculations and simulations with RayMan model (advanced) and own results
- Climate resilient cities in India in 2050
- Podium discussion about the climate resilient cities in India in 2050



Prof. Andreas Matzarakis Professor University of Freiburg, Germany



Prof. Manoj Kumar, Professor National Institute of Technology Patna, India

Resource Person

Prof. Andreas Matzarakis, is a globally renowned expert in human biometeorology, urban climatology and climate impact research. He served from 2015 to 2024 as the Head of the Research Centre for Human Biometeorology at Deutscher Wetterdienst in Freiburg, Germany, and is a Professor at the University of Freiburg. With an academic career spanning over three decades, his contributions include pioneering research in thermal comfort, urban heat islands, micro-scale modelling and climate adaptation strategies. He has authored more than 350 peer-reviewed journal papers, with an H-index of 80, and is a recipient of multiple awards for his groundbreaking work on climate, climate change and human health.

Prof. Manoj Kumar is a distinguished academician in Architecture and Planning, affiliated with the Department of Architecture and Planning at National Institute of Technology Patna. Specializing in urban and regional planning, he contributes significantly to advancing knowledge in urban planning and its intersection with environmental adaptation. He actively engages in teaching and mentoring, emphasizing practical applications and interdisciplinary approaches to urban challenges.

Who may attend

- Students at all levels (B. Arch./B. Plan./B. Tech./B. Sc./M.Sc./M. Tech./MURP/M. Plan./M. Arch./ PhD) and faculty from reputed academic institutions and technical institutions.
- Architects, Engineers, Planners, Designers, Decision-Makers, Staff from private and government organizations, including local and regional planning, sustainability and disaster risk management.

Course Registration Details

Registration fees details are as follows:

Research Scholar/PG/UG Students: INR 1,000 Academician /faculty: INR 2,000 R&D/Industry/Corporate: INR 3,000

Last date for registration is June 16th, 2025

Account details are as follows:

:	50399114681
:	IDIB000B810
:	Indian Bank
:	NIT Patna
	: : :

Please transfer the required amount of fees for the course before filling Google Registration :



https://forms.gle/9aCLHfDrLZfnPUjg7

Registration has to be done through this link or QR code given above.

The course has limited enrolment capacity of 50 participants, divided equally between the host institute & external applicants. Registration will be processed on a first-come, first-served basis, subject to availability. Interested candidates are encouraged to enrol promptly to secure their spot.

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