SDG 11: SUSTAINABLE CITIES AND COMMUNITIES

MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

Sustainable development is a critical component of IITGN campus' design and development processes. The institute has taken several measures to make an impact and improve its outreach concerning each of the three pillars of sustainable development (economic, environmental and social).
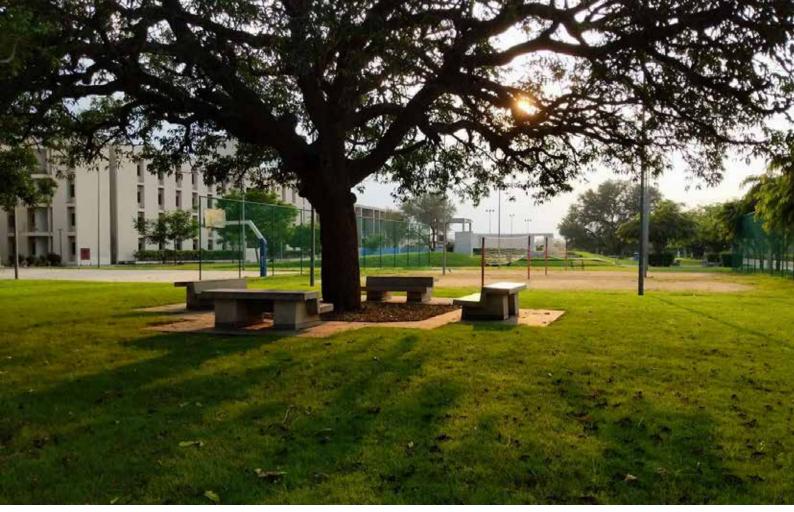
Many of the research projects and activities at the institute are focussed on sustainable cities and communities. The institute also offers educational courses and conducts events and community outreach programmes themed on the same.

Research

Extensive research activities are conducted at the institute to address challenges of urbanisation, including pollution, water quality and availability, among others. More than 10 researchers at the institute work in the areas of road dust in urban areas, emissions from landfill sites, wastewater treatment, microplastic contamination in tropical Indian rivers, lakes and sewage, etc. Some of the ongoing research projects in this sphere are mentioned below.

- AI and sensor networks for air-quality monitoring; SERB
- Assessing the concentration and sources of indoor VOCs and particulate matter (PM) in urban India and comparing to levels in China and the US; DUKE University
- Cultural heritage preservation and restoration using digital 3D models; Science and Engineering Research Board
- Development of low-cost, efficient and scalable materials for CO_2 capture using naturally available non-toxic stable materials and industrial solid waste; Department of Science and Technology (DST), Government of India
- Development of a sliding bearing for earthquake protection of structures; DST
- Gandhipedia: A one-stop AI-enabled portal for browsing Gandhian literature, life events and social network; National Council of Science Museum, Ministry of Culture
- Geosynthetic-reinforced soil walls and abutments for high-speed railway systems; High Speed Railways Innovation Centre
- High sensitive detection of atmospheric pollutant gases to monitor the effects of industrial emissions on urban air quality; Gujarat Council of Science and Technology
- Impact of air pollution on Covid-related secondary exacerbations; Google
- Impact of sea-level fluctuations, climate change or tectonic activity on the decline of the Harappan settlement of Dholavira, Kutch, India; DST
- Indigenous cultural heritage as a facilitator for SDGs; Flinders University
- Multi-sensor drone survey of Dholavira, Gujarat, Archaeological Survey of India
- Synthesis of magnetic catalyst-coated microbubbles for removal of trace pollutants; DST
- UAV-based laser spectroscopic monitoring of greenhouse gas emissions in urban and rural India;

Royal Academy of Engineering
- Water for change: Integrative and fit-for-purpose water sensitive design framework for fast-growing livable cities; DST

The project "Impact of sea level fluctuations, climate change or tectonic activity on the decline of the Harappan settlement of Dholavira, Kutch, India" funded by the DST under the Science & Heritage Research Initiative (SHRI) aims to understand whether and to what extent the sea base level changed during the existence of the Harappan city of Dholavira (Rann of Kutch). It will also study the impact of tectonics on Dholavira's vicinity and of seismic activity on the city's evolution. Besides these possible factors, it will look at evidence of the impact of climate change (with the monsoon weakening at ~4 ka) and abandonment of Dholavira.

The Central Public Works Department (CPWD) has set up a Research & Development (R&D) Cell at IITGN Research Park to undertake R&D for its projects of interest. The Cell, aimed at finding efficient solutions to real problems faced by the construction industry, will work closely with IITGN for cutting-edge research in the housing and urban-development sector. IITGN and CPWD will collaborate on various academic, research, training and capacity-building programmes.

The new R&D Cell at IITGN will enable active dialogue between academia and the industry implementers and help CPWD become technologically advanced and ready to address practical challenges on the field. The R&D undertaken will help in prioritising the field problems, devising the most appropriate technological solutions for them and, ultimately, in executing the projects faster to meet the growing housing and urban development demand in the country.

MICOB is a start-up supported by IIEC that provides products related to the construction industry. It develops 3D concrete printing blocks that use least energy and material, and minimises waste reduction thus leading to substantial decrease in the carbon footprint and emissions.

Operations

The institute encourages public access to its buildings. However, at present, as a relatively new institution (established in 2008), we do not have spaces such as museums, exhibition spaces/ galleries and/or works of arts and artifacts or natural heritage landscapes of cultural significance.

Library

The university as a body provides public access to the library. There are no charges for using the library and on-site. However, there are nominal charges for lending books and delivering articles to external (academic institutions and individual - researchers and academicians) members.

Pedestrian-friendly campus

The institute has been designed to be pedestrian and cycle-friendly and offers public transportation community members both on campus and outside (covering areas up to a distance of approximately 20 km toward the nearest city of Gandhinagar).

Possession and use of personal motor vehicles by the students is not permitted. Regular emails are sent to the students regarding no vehicle use on campus. Any student needing to park a personal vehicle for unforeseeable situations must place a request to the Dean (Student Affairs) with the reasons detailing the need behind the same.

Affordable housing for employees and students

IITGN has a residential campus with approximately 65% of its employees (including faculty and staff) staying inside. About 270 apartments are available and construction for the next phase of housing is ongoing currently. Hence, it reduces the need for a longer commute and gives flexibility to the employees for work.

The institute provides state-of-the-art residential facilities to all its students at an affordable fee. No student is denied hostel accommodation on account of non-availability.

Sustainable campus

The master plan had accounted for "environment and energy response" as one of its major components. It attempted to make the campus an exemplary project for sustainable development and the buildings were built to Green Rating for Integrated Habitat Assessment (GRIHA) and Energy Conservation Building Code (ECBC) standards. The master plan complied with the National Building Code 2009 of India, including the 'Approach to Sustainability'. The guiding principles included the following: a) complete and absolute respect for the environment at both micro and macro levels, and b) respect, conserve and, wherever possible, recycle resources. IITGN became the first campus in India to be awarded a five-star rating by Green Rating for Integrated Habitat Assessment for Large Developments (GRIHA LD) in 2016.

Education

Courses related to cities and environment offered at the institute are:
CE 401: Comprehensive Project - 1
CE 403: Construction Technology and Management
CE 404: Transportation Engineering
CE 605: Remote Sensing of Land and Water Resources
CE 613: Analysis and Design of Masonry Buildings
CE 629: Geosynthetics
CE 633: Water Resource Systems: Planning and Management
EE 426: Electric Vehicle Technology
EH 605: Modeling of Earth System and Sustainability
EH 610: Engineering Seismology and Seismic Hazard Analysis
ES 403: Introduction to Fire Engineering
ES 635: Water Quality Engineering

ES 652: Introduction to Electrical Systems
FP 100: Foundation Programme
IN 304: Ancient Indian Technology
IN 402: Human Evolution

The Humanities and Social Sciences discipline at the institute offers several courses for learning languages such as French, Sanskrit, Chinese, Urdu, Japanese, and Gujarati, and the students are encouraged to take these courses. Moreover, the institute has established four endowed chairs in Sanskrit, Urdu, Classical Indian Music and Indian Performing Arts to promote Indian cultural traditions in its curriculum.

Semester Course on "The Ancient Idea of India": The 4th edition of IITGN's unique semester elective course, Introduction to Indian Knowledge Systems (IKS), offered by the HSS started in January 2020. The theme for this year was 'The Ancient Idea of India' and offered a wide-ranging introduction to ancient India's intellectual, scientific and artistic knowledge, traditions, and early Indian society. Eight eminent scholars from various parts of India and overseas collectively taught the course along with course coordinators Prof Michel Danino and Mana Shah from IITGN.

The following short courses and lectures were organised at the institute relating to SDG11:

- Welcome Entanglements: Tracing Social Relations and 'Latent Commons' in PostEarthquake Kachchh by Prof Hanna Kim, Adelphi University, New York, on 18 July, 2019
- Anthropology and Human Rights by Dr Rosa Maria Perez, IITGN, on 26-30 August, 2019
- High-Speed Rail (HSR) & Related Research Projects by Dr Norimichi Kumagai, Railway Technical Research Institute (RTRI), Japan, and Shri Achal Khare, National High-Speed Rail Corporation Ltd (NHSRCL), on 27 August, 2019
- Complexity, Design, and Culture: Where Are the Next Indian Inventions? by Prof Nuno Guimarães, ISCTE-University Institute of Lisbon, on 4 September, 2019
- Composing Actor Networks and Collective Action for Community Based Climate Change Adaptations in Coastal India by Prof Thomson Kaleekal, Cochin University of Science and Technology (CUSAT), on 13 September, 2019
- Filling the Knowledge Gap on Air Quality in Indian Cities by Dr Sarath Guttikunda, UrbanEmissions,on 24 September, 2019
- (Re)locating Early Kashmir: From Unique History to Connected Histories by Dr Shonaleeka Kaul, Jawaharlal Nehru University, New Delhi, on 30 October, 2019
- 'Why is Indian Traditional Technology Relevant Today?' by Prof D P Mishra, IIT Kanpur, on 14 December, 2019
- Swami Vivekanand's Principles and their Relevance in the Current Era and Youth by Dr Maunas Thaker, Vivekanand Kendra, Kanyakumari, on 12 January, 2020
- Of Mosaic, Hybrids, and Braids - Seminar on Human Evolution' by Dr Yann-Pierre Montelle, a behavioral archaeologist, on 20-28 January, 2020
- Progressive Urdu Poetry by Prof Mohd Mubashshir Ahsan, IITGN, on 29 January, 2020
- Promoting French Language and Culture Across India by Sir Gael De Kerguenec, Alliance Française of Ahmedabad, on 11 February, 2020
- Reflections on the Languages of Coaching by Dr Chaise Ladousa, Hamilton College in New York, on 12 February, 2020
- SPARC project

As part of the SPARC project 'Cultural Heritage as a Facilitator for the Sustainable Development Goals', Prof Claire Smith of Flinders University, Australia visited IITGN during January-February 2020. She was accompanied by a distinguished cultural anthropologist, Dr Gary Jackson, an archaeology scholar Dr Ralph Jordan and her RA, Mr Luke Rooney. Prof Smith, an anthropological archaeologist of repute, taught a half-semester credited course titled 'Indigenous Archaeology and Digital Repatriation'. It covered the experiences of Indigenous peoples around the world with focus on the indigenous people and ancient science of Australia. Two IITGN faculty members, Prof Alok Kumar Kanungo and Prof Nishaant Choksi took lectures on Naga artifacts and repatriation and Community museums run by Adivasi Bhil communities in Gujarat, respectively.

Community outreach

Event on high speed rail in India

Shri Achal Khare, Managing Director, National High-Speed Rail Corporation (NHSRCL) and Dr Norimichi Kumagai, President, Railway Technical Research Institute (RTRI), Japan addressed researchers, faculty and students of IITGN and discussed about the maiden Mumbai-Ahmedabad high-speed rail (MAHSR) project.

NHSRCL held an advisory council meeting of High Speed Rail (HSR) Innovation Centre Trust and organised a seminar on High Speed Rail & Related Research Projects at the institute on 27 August, 2019. Shri Khare provided an overview and highlights of the MAHSR project, aimed at saving travel time, facilitating comfort, reducing conventional traffic and boosting the movement of goods and services between the cities. He also discussed some of the challenges and research opportunities in the project. Emphasis was laid on environmental considerations and challenges by exploring innovative ways to recycle/reuse

construction waste generated from the project, use of polythene waste as a cost-effective construction material like paver blocks, tree transplantation to minimise environmental impact and extensive use of rain water harvesting in the project.

Shri Khare invited young researchers and students to come up with innovative, cost-effective and sustainable research solutions for the development and implementation of the project in order to create a difference.

Kala Samanvay by Spic Macay

The Cultural Council at IITGN and the SPIC MACAY IITGN chapter organised Kala Samanvay, a series of live online cultural events during 12-14 September, 2020. Renowned artists and Padma Shri recipients Geeta Chandran performed BharatanatyamPrahlad Tipaniya presented Kabeer Sangeet, on 12 and 13 September, respectively. Besides, an acclaimed Japanese movie, Kumonosu-jō (Throne of Blood) by Akira Kurosawa was screened and discussed on 14 September.

Explorer and Gram Fellowship

Explorer Fellowship at IITGN is a unique annual summer programme which allows its students to discover India's cultural diversity by exploring the length and breadth of the country on a very limited budget. This year, a total of 84 students in 27 different teams undertook the fellowship. The students shared their experiences from the journey of discovery through short video documentaries on 21 September, 2019.

Gram Fellowship is an initiative by the institute that provides the students with an opportunity to spend three to six weeks to experience the nuanced rural/peri-urban life in various parts of India and understand its problems. The students may also take up a project to address the issues through product/ service or any other solutions. The projects are funded by the institute, up to INR 25,000.

India ki Khoj

IITGN's week-long cultural immersion programme, India Ki Khoj, had 22 students from the California Institute of Technology (Caltech) and IITGN, to understand and appreciate multiple facets of India. The 8th edition of the programme was conducted from 16 to 22 December, 2019. Dr Rajmohan Gandhi delivered the inaugural lecture. The event was coordinated by Prof Mona Mehta and Prof Jaison Manjaly.

Cyclone Amphan and Covid-19 relief work

The institute faculty members, staff and students donated INR 2, 25, 411 to the West Bengal Chief Minister's Relief Fund for relief and reconstruction activities of those affected by Cyclone Amphan. Earlier, the community had

contributed an amount of INR 11, 91, 921 to the PM CARES Fund in the wake of Covid-19 pandemic.

Expressing solidarity with fellow Indian citizens affected by the onslaught of the pandemic and natural calamities, the IITGN community has contributed a total amount of INR 14, 17, 332 in the span of about two and a half months towards relief and reconstruction work in India.
This amount has been collected on different occasions under the auspices of an institute level committee formed for generating support during natural calamities, and the contributions have been sent to central government and state government relief and crisis management avenues to help people affected by Covid-19 and Cyclone Amphan.

Languages of India

India is one of the most linguistically diverse nations (fourth largest) of the world. Our country has four major language families. The biggest one is Indo-European. Next, follow the Dravidian languages, which are spoken mostly in the Southern parts of India. The Austro-Asiatic (Munda) is the third family and the fourth one is the Tibeto-Burman. Moreover, there are several languages that do not fit into any of these families. Unlike many other places in the world, the people of India write these languages in multiple scripts, making our nation one of the most graphically diverse nations across the globe.
A glimpse of the different languages, scripts, and practices of multilingualism in our country was delivered by Nishaant Choksi, faculty in the Humanities and Social Sciences discipline) in the Virtual Seminar Series by IIT Gandhinagar.

BLITHCHRON 2020

The tenth edition of Blithchron had its opening ceremony on 1 February, 2020 and received a massive footfall of 12,000. The student body of IITGN worked hard to successfully bring the fun and entertainment that Blithchron is known for, with amazing cultural performances and events.

JASHN 9.0

The ninth edition of Jashn, the intra cultural fest of IITGN, was held during 9-12 January, 2020. The four-day event was full of fun and enjoyment for the community.

SPIC MACAY

The programmes related to culture and local arts take place on a regular basis at different times of the academic year. The Society for the Promotion of Indian Classical Music And Culture Amongst Youth (SPIC MACAY) events also take place at the institute, for instance, performance by Sarangi player, Ustad Murad Ali Khan on 21 February, 2019. Blithcron (annual fest) also includes public performances related to local arts.