



## **SDG 17: PARTNERSHIPS FOR THE GOALS**

*STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALISE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT*

The Indian Institute of Technology, Gandhinagar (IITGN) strives to develop a strong outreach programme of training, education, awareness and community engagement on sustainable development and promote collaboration among scholars, policy makers, industry, non-profit organisations and other stakeholders. The institute organises various events including an annual Sustainability Fair, a regular Sustainability Seminar Series, and collaborates with regional, national and global institutes to facilitate networking amongst a broad range of stakeholders.

### **Research**

Most of the research projects undertaken by the institute are sponsored by the State and National government departments and ministries including Ministry of Education, Ministry of Jal Shakti, Ministry of Earth Sciences, Ministry of Culture, Ministry of Environment, Forest and Climate Change, Department of Science and Technology, Department of Biotechnology, Science and Engineering Research Board, Gujarat Council of Science and Technology, Gujarat State Biotechnology Mission and Gujarat Energy Development Agency. Council of Scientific & Industrial Research, Defence Research and Development Organisation, Indian Institute of Tropical Meteorology, National Thermal Power Corporation, National Centre for Earth Science Studies, Board of Research in Nuclear Sciences are some of the national level organisations that provide funding support for the research activities.

Some of our research projects, including the domains of water, climate change, and wildlife are funded by non-profit organisations such as WIN Foundation, World Wide Fund for Nature, India, Biotechnology Industry Research Assistance Council, and UNICEF. Thus, the institute as a body collaborates with these NGOs to tackle the SDGs through various research programmes.

The institute also collaborates with international organisations to review comparative approaches and develop international best practice on tackling the SDGs. Examples include Duke University, Flinders University, Google, Social Science Research Council, Royal Academy of Engineering and programmes such as UK India Education Research Initiative and Indo-German Science and Technology Centre.

## Education

Sustainability education is becoming increasingly central to academic institutions. The institute announced a Minor in Sustainable Development focusing on various sustainability-related opportunities and challenges. It is an interdisciplinary programme including subjects from various fields such as water, climate change, pollution, energy and natural resources. In addition, the institute offers several courses to its students that relate to sustainability.

- Foundation Programme

The Foundation Programme, which is mandatory for all first year undergraduate students, includes sessions on social awareness (with NEEV, NYASA), gender sensitisation, mental health and well-being, physical fitness, waste management, etc. which relate to SDGs.

- Courses related to sustainable development

The institute offers core and elective courses that relate to sustainable development. The following graduate and undergraduate courses related to sustainability were offered in 2020-21:

**CE 201: Earth Materials and Processes** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 32

**CE 202: Sustainability and Environment** | No. of credits: 3 | Total no. of students who enrolled for the course (Semester II - 2020-21): 30

**CE 308: Water Resource Engineering** | No. of credits: 3 | Total no. of students who enrolled for the course (Semester I - 2020-21): 28

**CE 605: Remote Sensing of Land and Water Resources** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester II - 2020-21): 15

**CE 611: Advanced Engineering Hydrology** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 6

**CE 633: Water Resource Systems: Planning and Management** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 28

**EH 602: River Morphology and Ecology** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester II - 2020-21): 5

**EH 605: Modelling of Earth System and Sustainability** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 10

**EH 608: Biodiversity Conservation and Sustainable Development** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester II - 2020-21): 29

**ES 632: Energy Systems** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester II - 2020-21): 10

**ES 635: Water Quality Engineering** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 12

**HS 515: Politics of the Environment** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I - 2020-21): 38

**IN 304 : Ancient Indian Technology** | No. of credits: 4 | Total no. of students who enrolled for the course (Semester I 2020-21): 37

- Non degree programmes

A student who is registered for a degree in a recognized institute or university in India or abroad, and who is officially sponsored by that institute or university to complete part of their academic requirements at IITGN, can apply for admission to IITGN as a non-degree student. Such a student may carry out research, or take courses for credit or otherwise, or may use other academic facilities.

- Centre for Creative Learning

Centre for Creative Learning (CCL) at IIT Gandhinagar is involved in STEM education. CCL came into being in April 2017, as a space that nurtures a scientific temper and the inherent creativity in students and teachers alike. The idea was, and remains, to immerse oneself in a subject in order to learn it, to do rather than read. We need to make our classes engaging, provide experiential learning, foster creativity and innovation with a sole focus on concepts. The Centre boasts of 1000+ unique STEM models and activities, including 100+ STEM and hands-on learning workshops for over 10,000 teachers and engineering college professors, and interaction with 100,000 students from all across the country. As per UNSDGs and UNESCO websites, "STEM education is a global prerequisite for individual development and participation in a technology-driven world, which is why we focus our education programme on science and technology. Additionally, skills such as critical thinking, problem solving, and the ability to innovate are increasingly important for openly embracing change and responsibly shaping the future."

- Teaching and learning exchange partnerships

During the academic year 2020-21, nearly 15 students undertook virtual internships and exchange programmes in international organisations including research centres, universities, private organisations for research activities and internships. Due to the outbreak of COVID-19, there was a restriction on international travel. No faculty members from the institute travelled abroad for teaching or to attend any events from July 2020 to June 2021.

- Student Leadership Conclave

The fourth edition of the Student Leadership Conclave was organised by IITGN students in a virtual mode on January 9-10, 2021. Students from all 23 IITs participated in the two-day conclave to discuss various emerging issues.

- Short courses

The Institute conducted a total of four online short courses under TEQIP-III from January to March 2021. The four short courses were titled as - 1) 'Data Science & Analytics'; 2) 'Frontiers in the Energy-Water Nexus'; 3) 'Design of CMOS Operational Amplifier ICs- A unique pedagogical approach'; and 4) 'Role of Power Electronics in Power Engineering'. About 100 engineering faculty of the country participated in these courses.

## **Community Outreach**

- ONLINE INSERVICE COURSES FOR KVS teachers

Centre for Creative Learning (CCL) conducted two 12-day online in-service courses for teachers of Kendriya Vidyalaya Sangathan (KVS). The objective was to train them about ways to engage students online. The online course was conducted from May 26 to June 6, 2020, and June 29 to July 10, 2020 for Mathematics and Science teachers respectively.

- ACM-W GRAD COHORT 2020

CM India Grad Cohort 2020, the third pan-India workshop for women in computing, was jointly organised by ACM-W India and the discipline of Computer Science Engineering at the Indian Institute of Technology Gandhinagar from July 24 to 26. The ACM-W India seeks to take forward the task of the ACM community, but with a special emphasis on women empowerment in computer-related fields and domains. It internationally advocates the complete engagement of women in all aspects of computing by providing a wide range of programs and services. The student chapters are created to help, recruit, and retain students in computer science. Professional chapter-sponsored activities educate girls and women about careers and provide networking opportunities. ACM-W India encourages girls to participate in computing studies and research. It also focuses on providing a platform for sharing information, resources, ideas, and experiences so that women can effectively face the challenges in their work environments. One of its goals is to promote computer literacy, particularly in rural India with the objective of empowering underprivileged women and children and in the process, enabling them towards being independent and self-reliant.

### **INDIAN SYMPOSIUM ON MACHINE LEARNING**

IITGN and IIT Kharagpur jointly organised the first Indian Symposium on Machine Learning (IndoML) on the theme "AI for Science and Science for AI" during December 16-18, 2020. More than 20 experts from all over the world discussed state-of-the-art Machine Learning research and related topics during the event. Around 3000 participants registered for the virtual event from across the globe.

### **31ST IAGRG MEETING**

The discipline of Physics organised the 31st meeting of Indian Association for General Relativity and Gravitation (IAGRG) as a web conference on December 19-20, 2020. The broad theme of the web conference was - 'Quasinormal Modes from Black Holes'. National and international scholars and subject experts were invited as speakers during the conference.

#### NIDHI SEED SUPPORT PROGRAMME IIT

Gandhinagar Innovation and Entrepreneurship Center (IIEC) has received a sanction of funds worth Rs 10.50 crores from the Department of Science and Technology, Government of India under the Nidhi Seed Support Programme. The funds can be utilised to support promising startups incubated at IIEC by providing them seed funding to the order of Rs 25 to 50 lakhs.

#### 30-30 STEM PROGRAMME

The Centre for Creative Learning (CCL) at IITGN, in collaboration with the Central Board of Secondary Education (CBSE) and IISER Pune, launched '30-30 STEM', a 30-week online education programme for teachers as well as students and their parents. Its objective was to unlock the beauty, mystery and magic of Science and Math around us and make STEM learning more engaging. Since its launch on August 16, 2020, the Sunday-weekly programme has received an overwhelming response from all over the country, with each episode's viewership touching lakhs.

#### FIRST DNA NANOTECHNOLOGY INDIA VIRTUAL SYMPOSIUM

A virtual Symposium on DNA Nanotechnology India, co-organised by IITGN and IISc Bangalore, was held on September 4-5, 2020. More than 3,000 participants virtually attended the two-day programme. Several eminent speakers and scholars shared their knowledge and expertise with the audience. The meeting provided participants a platform to connect with each other and collaborate for scientific exchanges.

#### WEBINAR SERIES ON TRANSLATIONAL RESEARCH IN NEUROENGINEERING AND NEUROREHABILITATION

In association with the University at Buffalo (SUNY) USA, IITGN is organising a webinar series on Translational Research in Neuroengineering and Neurorehabilitation. During this quarter, the series has hosted ten webinars delivered by eminent speakers from USA, UK, France and India. The webinar series concentrates on emerging applications of Neuroengineering with focus on rehabilitation. Experts on cerebrovascular and neurological disease and neurological disability from different countries have been disseminating their research during these webinars. The ongoing webinar series has lined up a few more interesting talks in coming weeks.

#### INDO-UK VIRTUAL CONFERENCE

IITGN hosted 'Indo-UK Virtual Conference on the 5C's of Water Vulnerability: Climate Change, Contaminants, Co-occurrence, Conflicts, and COVID-19' from December 14-16, 2020. The three-day event attracted more than 200 participants from all over the world. The conference was co-organised by the discipline of Earth Sciences, KPCSD, UKIERI, Newcastle University, British Council, and the Department of Science and Technology, Government of India.

#### KVS AND JNV IN-SERVICE WORKSHOPS

The Centre for Creative Learning (CCL) conducted their second spell of online in-service workshops in November and December 2020. About 400 high school teachers of Kendriya Vidyalaya Sangathan (KVS) and Jawahar Navodaya Vidyalaya (JNV) from across the country participated in the workshops on Math, Science, Computer Science, and Chemistry.

#### JOY OF ENGINEERING

CCL-IITGN conducted two online sessions on ‘The Joy of Engineering’ for about 65,000 first-year students of nearly 150 engineering colleges of the APJ Abdul Kalam Technological University, Kerala, on November 30 and December 2, 2020. Both sessions were conducted as a part of the training for the newly-inducted engineering batch of the University. The sessions aimed to motivate students about engineering by focusing on problem-solving, algorithmic and critical thinking. The team conducted two similar sessions for the students of IIT Gandhinagar and IIT Jammu as well.

#### NPSC 2020

The 21st edition of National Power System Conference (NPSC 2020) was hosted online by the Electrical Engineering discipline during December 17-19, 2020, on the theme ‘Sustainable Energy and Resilient Future Grid’. The conference featured 14 Keynote talks, two industry-academia panel sessions, four tutorial sessions, and 132 technical paper presentations. More than 200 participants from India and abroad participated.

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#### WEBINAR ON GANDHI AND THE ADIVASI QUESTION (SDG 1, 17)

IITGN and Flinders University, Australia, with support from SPARC, Ministry of Education, Government of India, organised a one-day international webinar on ‘Gandhi and the Adivasi Question’, on October 1, 2020. Many Gandhian experts, scholars and Adivasi activists participated in the webinar.

#### JAIST-IITGN INT’L WORKSHOP

The Japan Advanced Institute of Science and Technology (JAIST) and IITGN jointly organised an online international workshop on ‘Education under the Pandemic and Post-pandemic Era’ during March 8-9, 2021. The inaugural ceremony was attended by Prof Sudhir K Jain, Director, IITGN, and Prof Terano Minoru, President, JAIST. Prof Shungo Kawanishi, Research Professor, Global Communication Centre, JAIST, delivered the keynote lecture. A total of eight faculty members, eight staff members, and 16 students from both the institutions took part in the two-day workshop.

#### SUSTAINABILITY FAIR

The Dr Kiran C Patel Centre for Sustainable Development hosted its third annual Sustainability Fair online on March 26, 2021, on the theme of “Renewable Energy and Water Resources” which has a significant linkage with climate change. The Fair was inaugurated by Shri Vijay Rupani, Chief Minister of Gujarat. The event featured keynote addresses by Dr Kalanithy Vairavamoorthy, Executive Director,

International Water Association; Dr Ashok Das, Founder CEO, SunMoksha; and Dr Rajendra Singh, Chairman, Tarun Bharat Sangh, on topics related to challenges and opportunities in the international water sector, sustainable energy for rural development and community decentralised water management respectively. Online interactive networking sessions and nearly 50 virtual exhibition stalls by industries and organisations working on renewable energy, water and other sustainability issues were hosted at the event. More than 600 participants attended the Fair from India and across the globe, including Singapore, Thailand, United Arab Emirates, Bangladesh, Germany, United States, Pakistan, Malaysia, Nigeria, Indonesia, Egypt and Sri Lanka.

#### SUSTAINABILITY SEMINAR SERIES

The Centre organised 14 webinars between September 2020 through March 2021 under the series. Speakers from world-renowned organisations covered topics related to climate change including water, pollution, energy and natural resources, wildlife and ecosystems at the webinars. More than 1,000 people from India, as well as Australia, Austria, Brazil, Ecuador, France, Gambia, Germany, Hong Kong SAR, Indonesia, Italy, Japan, Kyrgyzstan, Saudi Arabia, Spain, Sri Lanka, Switzerland, UAE, UK, and USA, attended the series.

#### INTERNATIONAL WORKSHOP ON ADVANCED CELL CULTURE, MICROSCOPY AND BIOIMAGING

IITGN, in association with Gujarat State Biotechnology Mission (GSBTM), hosted the first phase of an International Workshop on Advanced Cell Culture, Microscopy, and Bioimaging on February 20, 2021. Nearly 50 participants from various colleges in Gujarat attended the workshop.

#### WORKSHOP ON CAPTIVE MIND

The discipline of Humanities and Social Sciences, in collaboration with the Centre for Southeast Asian Studies, Kyoto University, Japan, organised an online workshop on ‘Revisiting the “Captive Mind”: Intellectual Imperialism in the Contemporary Asian Academy’ on September 25, 2021.

#### WORKSHOP BY JAIST AND IITGN

The Japan Advanced Institute of Science and Technology (JAIST) and IITGN jointly organised an online international workshop on ‘Education under the Pandemic and Post-pandemic Era’ during March 8-9, 2021.

#### WEBINAR SERIES ON ROBOTICS FOR REHABILITATION

The Human-centered Robotics Lab at the Institute initiated a Spring'21 webinar series on the subject ‘Robotics for Rehabilitation and Elderly Care’. The series hosted five webinars with national and international experts from medical, social science, and engineering domains to cover a variety of topics like biomechanics, dynamics of human-robot cooperation, movement disorders, robotic exoskeletons, etc. About 600 students, professionals, and researchers attended these webinars.

#### WORLD WATER DAY 2021

The Dr Kiran C Patel Centre for Sustainable Development, in collaboration with the International Association of Hydrogeologists - Indian National Chapter, organised an event to celebrate World Water

Day 2021, on March 22, 2021. The event included two fascinating keynote talks by domain experts. A total of 91 people attended the session.

## Operations

- Explorer Fellowship

The IITGN Explorer Fellowship, introduced in 2015, is an annual summer programme that enables students, organised in small teams, to undertake a six-week adventure across the country. Fellows must travel to at least six states with at least one in the Northern, North-Eastern and Southern parts of the nation on a budget. They are required to plan their trip frugally, travelling by sleeper class on trains or by state government buses, and staying at low-cost accommodations such as youth hostels, homestays, and dharamshalas. The programme empowers students to set off on a journey of discovery, wherein they encounter diverse cultures and lifestyles.

- Sharing of resources with nearby communities

NEEV conducts various programmes including entrepreneurship development workshops, entrepreneurship awareness sessions, vocational skills training courses, stitching skills training courses, training courses on spoken English and computer skills, which are all aimed to enhance the employability and entrepreneurship mindset of the nearby communities. More than 2000 beneficiaries in about 15 villages have been supported through 50 projects and activities.

NEEV IITGN had taught stitching to more than 100 women in the two neighbouring villages of Palaj and Basan through a 2-month training. The pandemic situation provided an opportunity to NEEV to engage the village ladies in making cloth masks in the comforts of their homes in their free time and earn some money. A total of 25 women in the age group of 18-40 years from the villages of Palaj and Basan were trained to stitch products such as reusable cloth masks, curtains, cushion covers, tote bags, laptop bags, pouches, palazzos etc. The training enabled the women to achieve cumulative earnings of around Rs 3.7 lakhs. Also, close to 3800 masks made by village women trained by NEEV IITGN being distributed in the neighbouring villages on Palaj and Basan. Ten women from Basan village in the age group of 17-37 years were provided training in making 15+ variations of chocolate-based confectionery through the 'Chocolate Confectionery Making Workshop' conducted in the campus during October 12-16, 2020. Notably, eight women collectively sold products worth around Rs 34,000 through stalls put up at IITGN and through orders facilitated by NEEV during the Diwali festival season. A 'Decorative Candle Making Workshop' was conducted for 10 women from Palaj during October 21-23, 2020, and for seven women from Basan during November 3-5, 2020. NEEV organised a 'Dry-Snacks Making Workshop' on campus for 11 women from Basan village, in the age group of 18-45 years, during October 26-30, 2020. The trainer was Ms Geetaben Katva from Ahmedabad. The participants were taught to make dry-snacks such as shakarpara, mathri, besan ladoos and chakli. The trained village women collectively sold products worth around Rs 8,000 through stalls put up at IITGN campus and through pre-orders facilitated by NEEV during the Diwali festival season. The computer skills training course aimed to increase computer literacy among youth and women from the JANvillages surrounding IITGN. Through this course, the participants were taught basic computer operation, MS Word, MS Excel, MS PowerPoint, logging into the network, use of the internet, email basics, search engines, etc. Nearly 25 participants from the villages of Palaj and

Basan, in the age group of 18 - 37 years were provided training in basic computer skills for four weeks in the computer lab at IITGN.

- Memorandum of Understanding

Nearly 25 MoUs were signed between IITGN and the government, educational institutes (both national and international) and private organisations in the academic year 2020-21. Some of the areas covered by these MoUs include collaborative research, education and training in interdisciplinary areas, and promoting interaction and collaboration between faculty, staff and students through student, and faculty exchanges and academic and research programmes. The MoUs were signed with organisations located across the globe, such as Curtin University, Australia, Universidade Federal de Goiás, Brazil, and NSU, Bangladesh.

- 650 TF Supercomputing System

The Indian Institute of Technology Gandhinagar (IITGN) signed a Memorandum of Understanding (MoU) in October, 2020 with the Centre for Development of Advanced Computing (C-DAC), a premier R&D organisation of the Ministry of Electronics and Information Technology (MeitY), Government of India, to install a Supercomputing System at IITGN under the National Supercomputing Mission (NSM). As a part of this MoU, IITGN will work with C-DAC to install 650 TF Supercomputing System (70:30 CPU & GPU), with appropriate data centres with storage capacity at the Institute. The National Supercomputing Mission supports the government's vision of 'Digital India' and 'Make in India' initiatives and aims to consolidate efforts for achieving self-reliance in supercomputing for India.