



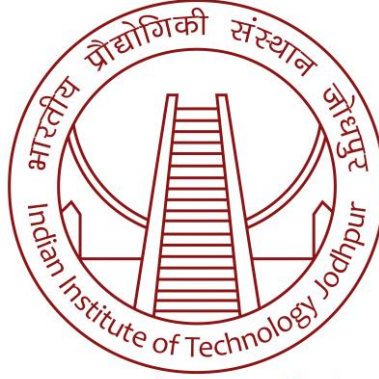
॥ त्वं ज्ञानमयो विद्वानमयोऽसि ॥

# Indian Institute of Technology Jodhpur

## भारतीय प्रौद्योगिकी संस्थान जोधपुर

6<sup>th</sup> दीक्षान्त समारोह  
**Convocation**  
Sunday, December 6, 2020





॥ त्वं ज्ञानमयो विज्ञानमयोऽसि ॥

# **Indian Institute of Technology Jodhpur**

**Sixth Convocation**

*December 6, 2020*



# Convocations of IIT Jodhpur

The Institute has hosted five convocations so far. They are:

<i>Convocation</i>	<i>Date</i>	<i>Venue</i>	<i>Chief Guest</i>
First Convocation	July 10, 2013	IIT Jodhpur Permanent Campus premises	<i>Shri Pranab Mukherjee,</i> Former Hon'ble President of India
Second Convocation	July 16, 2014	Town Hall, Jodhpur	<i>Dr. V. K. Saraswat,</i> Former Director General, DRDO
Third Convocation	December 8, 2016	Auditorium, AIIMS, Jodhpur	<i>Dr. Arvind Panagariya,</i> Vice Chairman, NITI Aayog, Government of India
Fourth Convocation	August 25, 2018	Lecture Hall 110, IIT Jodhpur	<i>Dr. Srikumar Banerjee,</i> DAE Homi Bhabha Chair Professor, Bhabha Atomic Research Centre, Mumbai
Fifth Convocation	December 17, 2020	Lecture Hall 110, IIT Jodhpur	<i>Prof. S. C. Dutta Roy</i> INSA Honorary Scientist Formerly Professor and Head, Department of Electrical Engineering, IIT Delhi



**Professor Geoffrey Hinton**  
*Chief Guest, 6<sup>th</sup> Convocation, IIT Jodhpur*

*Professor Geoffrey Hinton* received his BA in Experimental Psychology from Cambridge in 1970 and his PhD in Artificial Intelligence from Edinburgh in 1978. He did postdoctoral work at Sussex University and the University of California San Diego and spent five years as a faculty member in the Computer Science department at Carnegie-Mellon University. He then became a fellow of the Canadian Institute for Advanced Research and moved to the Department of Computer Science at the University of Toronto. From 1998 until 2001, he set up the Gatsby Computational Neuroscience Unit at University College London and then returned to the University of Toronto where he is now *an emeritus distinguished professor of Computer Science*. From 2004 until 2013 he was the Director of the program on “Neural Computation and Adaptive Perception,” funded by the Canadian Institute for Advanced Research. In 2013, Google acquired Hinton’s neural networks startup, DNNresearch, which was developed out of his research at the University of Toronto. He is a *Vice President and Engineering Fellow at Google* where he manages Brain Team Toronto, which is a new part of the Google Brain Team. He is also *Chief Scientific Advisor, Vector institute, Canada*.

He is also a fellow of the Royal Society, the Royal Society of Canada, and the Association for the Advancement of Artificial Intelligence. He is an honorary foreign member of the American Academy of Arts and Sciences and the National Academy of Engineering, and a former president of

the Cognitive Science Society. He has received honorary doctorates from the University of Edinburgh, the University of Sussex, and the University of Sherbrooke. He was awarded with the first David E. Rumelhart prize (2001), the IJCAI award for research excellence (2005), the NSERC Herzberg Gold Medal (2010), the Killam prize for Engineering (2012), and The IEEE James Clerk Maxwell Gold medal (2016), and the NSERC Herzberg Gold Medal (2010) which is Canada's top award in Science and Engineering, the NEC C&C award (2016), The BBVA Frontiers of Knowledge Award (2017), and the Honda prize (2019). University of Toronto faculty member and Google Brain Researcher Geoffrey Hinton was honoured with the **“Turing Award 2018”**, as one of the three pioneers in AI- an annual prize given by the Association for Computing Machinery (ACM) to individuals who’ve made contributions of lasting and major technical importance to the computer field.

He designs machine-learning algorithms. His aim is to discover a learning procedure that is efficient at finding complex structure in large, high-dimensional datasets and to show that this is how the brain learns to see. He was one of the researchers who introduced the back-propagation algorithm and the first to use backpropagation for learning word embeddings. His other contributions to neural network research include Boltzmann machines, distributed representations, time-delay neural nets, mixtures of experts, variational learning, products of experts and deep belief nets. His research group in Toronto made major breakthroughs in deep learning that have revolutionized speech recognition and object classification.

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# Convocation Program

Program		कार्यक्रम
Invocation	09.00 am	आवाहन
Arrival of the Academic Procession	09.03 am	शैक्षणिक शोभायात्रा का आगमन
Vande Mataram	09.03 am	वंदेमातरम
Declaring the Convocation Open	09.05 am	दीक्षान्त समारोह के प्रारम्भ की घोषणा
Welcome Address and Institute Report	09.06 am	स्वागत एवं संस्थान प्रतिवेदन प्रस्तुति
Chairman's Address	09.20 am	अध्यक्षीय संबोधन
Inauguration of the School of Artificial Intelligence and Data Science	09.30 am	स्कूल ऑफ आर्टिफिशियल इंटेलिजेंस एवं डेटा साइंस का उद्घाटन
Convocation Address	09.35 am	दीक्षान्त अभिभाषण
Award of Degrees	10.05 am	उपाधि प्रदान
Signing Register of Degrees	10.45 am	उपाधि पंजिका में हस्ताक्षर
Oath Taking by Graduates	10.47 am	स्नातक शपथ ग्रहण
Presentation of Medals and Prizes	10.50 am	पदक व प्रमाणपत्र वितरण
Declaring the Convocation Closed	11.05 am	दीक्षान्त समारोह के समापन की घोषणा
National Anthem	11.06 am	राष्ट्रगान
Departure of Academic Procession	11.07 am	शैक्षणिक शोभायात्रा का प्रस्थान
Program Ends	11.10 am	कार्यक्रम समापन

## **Director's Report**





**Professor Santanu Chaudhury**

Director, IIT Jodhpur

Respected Dr. R. Chidambaram, Chairman of Board of Governors, Prof. Geoffrey Hinton, Chief Guest of today's Convocation Ceremony, Members of the Board, and Members of the Senate, Distinguished Guests, Dear Parents & Graduands, my faculty and staff colleagues, members of the press, Ladies & Gentlemen:

IIT Jodhpur has completed 12 years since its existence. This journey has been a journey of accomplishment, challenges, learning and opportunities. The Institute is located at a sprawling residential Permanent Campus of 852 acres on National Highway 62, North-Northwest of Jodhpur. This campus is meticulously planned and designed with the highest concern for green and sustainable living. IIT Jodhpur, this year, has made significant progress in academics, research and physical infrastructure despite disruptions due to CoVID-19 pandemic.

It gives me immense pleasure to congratulate the 117 B.Tech., 51 M.Sc., 33 M.Tech., and 33 Ph.D. students (total 232) who are graduating today. Also, for the first time, a total of 57 B.Tech. students will also be conferred with *specialization/minor area certificates* in Artificial Intelligence, Engineering Innovation, VLSI Design, and Thermofluids Engineering, and *minors* in Entrepreneurship and Management along with their degrees.

## Academics

Towards repositioning and revamping the under-graduate and post-graduate education along with the research a range of new UG, PG and doctoral programmes have been introduced for the first time. To meet the present-day challenges, the institute has introduced new programmes with an appropriate blend of fundamentals and application-oriented skill sets needed by the industry. IIT Jodhpur has started four new B.Tech. Programmes from A.Y 2020-21 namely B.Tech. in AI and Data Science, Civil and Infrastructure Engineering, Chemical Engineering and Materials engineering with a new curriculum for future ready engineers. IIT Jodhpur also completed thorough revision of undergraduate curriculum in August 2020. The new UG curriculum provides opportunity for the students to tailor their programme based upon their interest and capability while remaining anchored in their core branch. With the rapid change in the contours of engineering education due to the emergence of Miniaturization, Parallelism, Smart Materials, Bio-mimetic Systems and AI, IIT Jodhpur has designed a curriculum to enable students to pursue these emerging areas in the broad context of their parent disciplines through specialisation or minor area certification. At the end of seven semesters, a student can also opt for a 5-year B.Tech.-M.Tech./MBA Dual degree.

To kindle the spirit of imagination and creativity IIT Jodhpur has introduced design thinking as a core component in the curriculum from the first year itself. Students can pursue their design ideas and improve upon them as they learn more about engineering. In their final year they can take up these ideas for possible product development by opting for Entrepreneurship as a minor. Furthermore, they can pursue product development at the IITJ incubator and credit relevant courses in their fifth year to get an M.Tech. degree in Entrepreneurship. Students will also have the opportunity to pursue their ideas by opting for Engineering Innovation as a minor through which they are expected to get initiated in Engineering Research in close collaboration with industry or research institutions. Students can also opt for a number of other minor areas and specializations.

The institute has also started four new M.Tech. and M.Tech.-Ph.D. dual degree programmes respectively in Chemical Engineering, Infrastructure Engineering with specialization in Environmental Engineering, Infrastructure Engineering with specialization in Energy and Materials

Engineering. These programs will not only provide basic foundation in core branches of the respective disciplines, also aimed to encourage the candidates to develop new technological solutions. The program covers a wide range of upcoming topics with strong industry focus. The institute has also started dual degree in M.Sc. in Physics and M.Tech. in Materials Engineering for providing industry-oriented career opportunities to science graduates.

The newly established school of management and entrepreneurship has started functioning from the academic year 2020-21 with a focus on Tech-MBA. The institute has started offering an MBA programme at its full capacity of 76 students admitted this year. The unique programme offers a nice blend of international exposure and experiential learning.

As first of its kind, the institute has started a joint Master's programme, a joint Master's-Ph.D. dual degree programme and a doctoral programme with AIIMS Jodhpur from September 2020 with a batch of 28 students. The joint programmes in Medical Technologies, jointly offered by IIT Jodhpur and AIIMS Jodhpur, are uniquely placed wherein one of the major objectives is to produce a pool of Medical Technologists in the country who shall develop need based and competitive Medical and Healthcare Technologies to address the current as well as emerging challenges of the future. These programs will also have a desired emphasis on translational R&D, innovation, technology management and entrepreneurship aspects to work upon for realizing the deployable techniques, technologies, devices and systems in medical and healthcare domains.

The institute has started new doctoral programmes in Chemical Engineering, Civil and Infrastructure Engineering, and Management and entrepreneurship from the academic year 2020-21.

To provide an impetus to inter disciplinary research and education on campus, the institute has created a division of interdisciplinary research to offer interdisciplinary postgraduate programmes. IIT Jodhpur is one of the pioneering institutes in the country currently to offer interdisciplinary M.Sc. programme in Digital Humanities with a unique and futuristic curriculum.

Even well before the onset of CoVID-19, the institute had equipped itself with adequate infrastructure to offer an online post-graduate programme. The institute has started an executive M.Tech. programme in Artificial Intelligence with 132 students which is being conducted in

synchronized online mode. The institute is also in the process to offer more such programmes in near future independently and in collaboration with industry partners.

IIT Jodhpur collaborated with AIIMS, Jodhpur, to formulate and offer a unique entrepreneurship oriented joint Masters and Ph.D. programmes in Medical Technology. These students are expected to identify gaps in the space of patient care and/or medical interventions through intensive immersion in IPD and OPD of AIIMS, before they make a choice of their problem to pursue for possible technology development.

With the significant development and improvement in the infrastructural facility, in a giant leap, the student strength at IIT Jodhpur has increased from 1602 to 2360. Currently we have 1184 B.Tech., 183 M.Sc., 22 M.Sc.-M.Tech., 433 M.Tech., 42 M.Tech.-Ph.D., 406 Ph.D., 72 MBA, 18 Masters and Masters-Ph.D. in Medical Technologies students on campus, making a total of 2360, and 33 students of preparatory programme with UG and PG Students in the ratio of 1:1.

IIT Jodhpur transitioned to the *synchronous online mode* of instructions post-CoVID-19 and successfully completed the curriculum for all courses. IIT Jodhpur is also one of the only few IITs which completed examinations for students of all years in an online proctored mode and examinations were attended by more than 95% of students. IIT Jodhpur has also started the new academic year from 1<sup>st</sup> September 2020 in an online mode and has introduced a *novel pedagogical approach* exploiting technologically enabled aids. IIT Jodhpur has also introduced a *unique* trimester system and lectures of short duration keeping in view a short span of attention in online mode with a focus on a smaller number of courses. Indian Institute of Technology Jodhpur is committed to offer a unique student focused educational experience which encourages self-learning, collaborative and exploratory learning.

## **Human Resources**

The Institute has 11 departments, School of Management & Entrepreneurship, and School of AI and Data Science. The number of faculty members has been increased to 160 this year. Currently

we have 05 Professors, 06 Visiting Professors, 01 Professor of Practice, 41 Associate Professors, 101 Assistant Professors and 06 Young Faculty Associates, associated with these departments and schools. In last one year 48 new Faculty Members have joined the Institute.

Recruitment of Faculty members is a continuous process and is underway. The Institute has consciously taken steps towards establishing centers and schools, wherein academicians and industry experts are expected to collaborate on topics of current interest and scope.

## **Research**

IIT Jodhpur is conducting cutting-edge fundamental as well as translational research in all areas of Science and Technology. The Institute is running several research programs in diverse areas through its various departments, Centres and Schools, Faculty and students have published in highly reputed international journals, highlighted in several national and international media.

Research output is dependent upon the quality of research work done by the Ph.D. students as well as demands of sponsored search projects. Ph.D. students have worked on interesting problems across variety of disciplines like: Nano-devices, sensors for IoT applications, cost-effective solar thermal and solar power generation, quantum technologies, computational gastronomy, spectroscopic applications for drug delivery, managing agro-industrial wastes, analyzing control strategy to improve energy efficiency, etc.

One of our research scholars has developed indigenous submerged Arc welding fluxes for welding of line-pipe steels using a systematic scientific methodology. The work has opened a new path for designing and developing submerged arc welding fluxes. In Solar-Thermal systems, the spectrally selective coatings are critical for efficient conversion of incident solar energy into useful thermal energy. These coating works under vacuum, thus increasing the system cost. The work by one of our students paved the way for chemically and thermally stable solar (spectrally) selective coatings, which can work in open ambience conditions. The developed low-cost process is further scaled for coating on large stainless-steel tubes for real solar thermal applications, showing efficient

solar thermal characteristics with enhanced thermal and corrosion resistance. A Ph.D. student has established a CVD growth facility for 2D-materials at IIT Jodhpur. He has fabricated MOS<sub>2</sub> nanowires which is the first successful growth attempt in the world. Gas sensors work at higher temperature, however, fabricated a NO<sub>2</sub> gas sensor works at room temperature by introducing the photoactivation method. Another Ph.D. student from the same research group, has established a process for large area synthesis of 2D materials by sputtering. He has studied the transport and optical properties of 2D/3D heterostructures. The student has further developed broad range and deep UV photodetectors using novel quantum materials.

Another scholar has addressed various aspects of non-classicality in different systems, bringing out an interplay of non-classicality with the underlying dynamics. Further, the student has analyzed various witnesses and measures of non-classicality, both spatial as well as temporal, for open and closed quantum systems. In this direction, another student has demonstrated game theoretical applications to analyze the role of eavesdroppers, correlations and amount of information transfer in cryptographic protocols resulting in better physical understanding of control and protection of nonlocal correlation in noisy environments. Such studies will benefit the fundamental understanding of controlling, protecting and processing the information to address current and future technological challenges. Our Ph.D. students have presented their quality research findings in several high standard national and international conferences and workshops.

The key achievements in the area of translational technologies as follows: (i) An Advanced Photo catalytic Oxidation Sterilization System based on UV-light and metal oxide nanoparticles catalyst panels; (ii) Medical Face Mask; (iii) filter for drinking water treatment and its use for chemical free agriculture; (iv) development of biofuel; (v) using dependable AI for CoVID-19 diagnosis; (vi) social awareness on loss of smell and taste as symptom for CoVID-19 at early stage of this pandemic, (vii) paper-based high performance transistors; (viii) transistors with biodegradable gelatin as electrical insulator, (x) therapeutic hydrogel for traumatic brain injury etc.

Despite the CoVID-19 pandemic, we have been able to fetch significant amount of research grants and our R&D strength has been increased significantly compared to the last year. At present, there are 121 ongoing research projects from various funding agencies and 9 consultancy projects.

We have created an excellent academic and scientific ecosystem, resulting in the submission of around 160 research projects, in the last year, to various funding agencies. This is a clear mark of the rapid growth of the Institute in the last one year.

Notably, few of our projects have led to the significant output such as, (i) discovery of synthetic molecular motor, (ii) process for nuclear waste treatment, (iii) novel cathode materials developed for high-temperature lithium-ion batteries, (iv) significant contribution of decoherence to quantum cryptographic tasks, (v) mechanistic clue on ageing and neurodegenerative diseases, (vi) discovery of therapeutic leads for Alzheimer's disease, (vii) unique platform for drug screening, (viii) discovery of nanomedicine targeting breast cancer, (ix) discovery of new vaccine delivery ligand, etc.

We provide a list of some of the currently operational projects: (i) iHub Dishti in the area of Computer Vision, AR and VR; (ii) Jodhpur City innovation Cluster. Few of them are as follows: (i) Indian Heritage in Digital Space of Interdisciplinary cyber physical Systems (~12.75 crores), (ii) Jodhpur City Knowledge and Innovation Cluster (~9.5 crores), (iii) TIH hub (iHub Drishti) (~7 crores), (iv) Multimodal Approaches to Develop Potential Therapeutic Leads Targeting Molecular Hot Spots of Duchenne Muscular Dystrophy for Clinical Trial (~3.89 crores), (v) Development of An AI platform for Human Health (~3.86 crores), (vi) Multimodal Approach for Repairing of Brain Damage: Small Molecule Mediated Neurogenesis from Stem Cells and Transplantation of Regenerated Neurons through Novel Scaffolds (~2.8 crores), (vii) FIST Project for creation of central facility (2.1 crores), (viii) Design and Fabrication of Indigenous Powder Fed Metal Additive Manufacturing Machine (2.1 crores), (ix) Generation of Entangled Photons and its application to Quantum Computation and Information Processing (~2 crores), (x) Detection and Prevention of Forged Obscene Images/Videos in the Social Networks using Machine Learning (A Social Media Engine for Discovering Doctoring in Obscene Multimedia (~2 crores) etc. Each of these projects have financial layout worth of more than one crore and total value of around 53 crores.

A diverse team of faculty from various areas of engineering and science conduct cutting edge research in core and applied areas of Artificial Intelligence of Things. This is evidenced by publications in highly reputed internationally peer reviewed journals, top conferences, numerous

sponsored projects, and strong industry collaboration. Recently, we have inaugurated Samsung India supported research innovation laboratory on AR/VR to meet the expectation for global need on upcoming immersive technologies.

## **Collaborative Activities**

Jodhpur City and Knowledge Innovation Cluster (JCKIC) has been sanctioned by the Office of PSA to the Government of India in July 2020. IIT Jodhpur has been identified as the Nodal Agency with more than 20 partners from Academia, R&D, Industry and Government agencies of the city of Jodhpur. The main objective of the project JCKIC is to create a mechanism for coordinated exploitation of knowledge base, scientific expertise and resources available among a large pool of academic and R&D Institutions, government agencies and industry in Jodhpur to enable innovation for accelerated growth of the local industry, to generate new initiatives in entrepreneurship and develop solutions related to critical problems faced by the city of Jodhpur and areas around. Initially, the cluster will focus its activities in three important domains viz. Medical Technologies, Craft and City Governance.

Also, IIT Jodhpur has created a vibrant ecosystem of innovation and entrepreneurship to facilitate and encourage its students to exploit their creativity. The system is in place to nurture the young minds and provide them opportunities to work on their innovative ideas and carry them forward in the form of projects leading to development of prototypes. As a part of this ecosystem, Institution Innovation Council is functional at IIT Jodhpur. The council consists of a number of faculty mentors and a large pool of students. It organizes a wide range of events for the students including Seminar by Experts, Workshops, Technical Competitions, etc. all through the year.



## Memoranda of Understanding

IIT Jodhpur is embarking in joining hands many industries, Institutes and organizations to collaborate in the area of mutual interests of R&D and Academic Collaborations. The MoUs signed during the year are listed below and few more are under considerations:

S.No.	MoU / Agreement signed between	Objective
1	Cognizant Technology Solutions India Pvt. Ltd. and IIT Jodhpur	Research and Development Agreement
2	Defence Laboratory (DRDO) Jodhpur and IIT Jodhpur	To Promote relations that mutually benefit each Institute, this being the primary aim of R&D and Academic collaboration and S&T cooperation towards developing new as well as improved products & technologies for strategic defense techniques.
3	IIT Jodhpur and IITJ Technology Innovation Start-up Centre	Promote technology Thought and action and Prepares needed technical human resources to meet the technology challenges of the nation.
4	IIT Jodhpur and Robosurg Med-Tech Pvt. Ltd.	To Provide Research Advisory and conduct activities related to SSI robotic Project.
5	IIT Jodhpur and PhiMetrics Telecom Value Added Services Pvt. Ltd	MoU for the research project titled "Voice and Video Analysis"
6	IIT Jodhpur and Oil India Limited	To collaborate for promotion of Research, innovation & education and provide a model for industry-academia partnership
7	IIT Jodhpur & Dayalbagh Educational Institute Dayalbagh, Agra & Environtech Instruments PVT. LTD. New Delhi	Development of sensors with IMPRINT SERB project
8	IIT Jodhpur and Umalaxmi Organics Pvt. Ltd	Umalaxmi Organics has expressed its intent and offer to avail the services of Institute for consultancy on research methodology and technical know-how, inputs, guidance and strategic insights and opportunity to participate in iron impurity Removal Project.
9	IIT Jodhpur & BlockApps AI Private Limited (Bangalore)	Development of Segmentation Algorithms for Surveillance and AI-assisted Health Diagnosis
10	Centre for Advanced Research in Imaging Neuroscience & Genomics, New Delhi and Indian Institute of Technology Jodhpur, Rajasthan	CARING and IITJ desire to implement, in the area of mutual interest, cooperative and collaborative activities, which would address multidisciplinary scientific, technologies and educational problems of relevance to the country.
11	IIT Jodhpur and ISCON Surgicals Ltd. Jodhpur	Transfer of technology titled "An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse" developed by IIT Jodhpur.

12	IIT Jodhpur and Kamtech Associates Private Limited	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
13	IIT Jodhpur and Chempharm Industries India Pvt. Ltd.	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
14	IIT Jodhpur and Parappadi Technology Private Limited	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
15	IIT Jodhpur and Johari Digital Healthcare Limited	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
16	IIT Jodhpur and ZENTIX BLUE OCEAN PVT. LTD., Jaipur	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
17	IIT Jodhpur and Mai Bharat	Transfer of technology titled “An Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” developed by IIT Jodhpur.
18	TRS Solutions LLP and IIT Jodhpur	Collaborative research in the area of Artificial Intelligence in Medical imaging to advance Radiology diagnostic Capabilities.
19	GE India Industrial Pvt. Ltd. (including subsidiaries and affiliates of General Electric Company, USA ("GE") and IIT Jodhpur	Evaluating technology, exploring research opportunities and/or engaging in future research.
20	IIT Jodhpur and Deakin University, ABN 56721584203 of 1 Gheringhap Street, Geelong, Victoria, Australia	Sharing of information relevant to potential collaborative research and development projects to facilitate an understanding of each party’s expertise, capabilities and requirements.
21	Samsung India Electronics Private Ltd. and IIT Jodhpur	Carrying out Research & Development including but not limited to reports, updates, commentaries, outputs, other written documents etc.
22	Indian Institute of Technology Jodhpur and Brandeis International Business School, Brandeis University, Waltham, Massachusetts	The principle of reciprocity and expression of interest for collaboration among both institutions in teaching learning and research and to explore the promotion of academic cooperation and exchange might include.

23	All India Institute of Medical Sciences Nagpur and Indian Institute of Technology Jodhpur	Promote relations that mutually benefit each Institute, this being the primary aim of a true academic collaboration; and S&T cooperation towards developing devices for diagnostics and treatment towards providing improved quality of healthcare.
24	(Agreement) L'INSTITUT FRANCAIS EN INDE (IFI) and Indian Institute of Technology Jodhpur	IFI will provide all necessary support to IIT Jodhpur to run the French language classes. The sole purpose of this agreement is the promotion and enhancement of the French language in partnership with IIT Jodhpur and its students and faculty.
25	NTPC Vidyut Vyapar Nigam Limited and Indian Institute of Technology Jodhpur	To Own, Acquire, Establish, Operate and Maintain Generating Stations, Transmission Systems and Distribution Systems.
26	(Non Disclosure Agreement) M/s Watsan Envirotech Private Limited (CIN U29253TN2013PTC091052) and Indian Institute of Technology Jodhpur	For Improvement of formulations and performance based on various types of water alleviations, using different models of G filters across India.
27	(Non Disclosure Agreement) M/s Watsan Envirotech Private Limited (CIN U29253TN2013PTC091052) and Indian Institute of Technology Jodhpur	For Improvement of formulations and performance based on various types of water alleviations, using different models of G filters, additionally modified with different variations of carbon/graphite nanostructures coated and tried on various substrates other than G filters, for creating filters and filter mediums
28	(Non Disclosure Agreement) Department of Information Technology, Jodhpur and Police Commissionrate, Jodhpur and Indian Institute of Technology Jodhpur	To set up a City Knowledge and Innovation cluster in Jodhpur to achieve the objective of effective and efficient governance.
29	General Agreement for Educational and Scientific cooperation and Student Exchange 2020-2025 between Indian Institute of Technology Jodhpur and Universite De Technologie De Troyes, France	To provide opportunities for students and staff to gain global experience, to foster coloration among faculty members in education and research and develop international academic projection
30	General Memorandum of Understanding between The University of Western Australia and The Indian Institute of Technology Jodhpur	Objectives are: * exchange of staff * Joint research activities * Joint conferences and other academic meetings *exchange of academic materials and information *exchange of students.
31	Indian Institute of Technology Jodhpur and Hearthealth Technologies Private Limited (HTPL) Bengaluru	Collaboration between the parties for Use of Technologies in Medical Image Analysis, Diagnosis and Prognosis.
32	Johari Digital Healthcare Ltd. and Indian Institute of Technology Jodhpur	To promote and facilitate Innovation, Commercialization and Mentorship of the Projects undertaken the aegis of JCoE and find solutions to specific problems in the area of Medical Devices and Technologies, wherein each Project undertaken shall be preceded with a Definitive Agreement recording the terms and conditions governing the Project.

33	Johari Digital Healthcare Ltd. (JDHL) and IITJ Technology Park Jodhpur	To cooperate for the purpose of (i) practicing and encouraging technology transfer and commercialization of innovations to increase research related economic growth in regions country and the oversea, (ii) identify and seek out joint business opportunities through national and International networking, and (iii) work out a common yearly planning for activities and Match Making events to be shared also with local economic promotion agencies , start-ups (iv) Leverage the expertise of Knowledge Partners in Healthcare, Environment and Livelihood.
34	MoU reg. Scheme of Fund for Regeneration of Traditional Industries (SFURTI)-between IITJ as Technical Agency and Khandi & village Industries Commission (KVIC) as Nodal Agency	To implement Scheme of Fund for Regeneration of Traditional Industries (SFURTI)-between IITJ as Technical Agency and Khandi & village Industries Commission (KVIC) as Nodal Agency
35	Agreement between IIT Jodhpur and National Reseqarch Iobachevsky State Univeristy of Nizhny Novgoraod, Russia	Implementation of cooperation in teaching, academic, student exchange and research, academic exchange of students (PhD Students)
36	IIT Jodhpur and Pingala AI Pvt, Ltd. Noida UP	To help incubate & accelerate novel technologies and business ideas by IITJ startups into viable commercial products.

## Incubation and Innovation Centre at IIT Jodhpur

IIT Jodhpur is engaged in (a) creating a vibrant technology institute that incubates and promotes learning, research, inventions and eventually innovations; and (b) providing technology innovations as a force to as many industries as possible for the economic value creation. Although one of the newer IITs, IIT Jodhpur shows much promise in many areas and rapidly enhanced and augmented the capacity/ecosystem within to address the technological challenges in the service of the society.

Among many initiatives to promote entrepreneurship leveraging the academic knowledge/resources, IIT Jodhpur has set up an Incubation and Innovation Centre in its campus to nucleate a cluster of new age ventures. The Centre was inaugurated on the 16<sup>th</sup> October 2020 by Dr. Ramesh Pokhriyal 'Nishank', Hon'ble Union Shiksha Mantri, Government of India in the august presence of Shri Gajendra Singh Shekhawat, Hon'ble Union Jal Shakti Mantri, and Shri. Sanjay

Dhotre, Hon'ble Minister of State for Education, Government of India. The focus is on the Deep Tech to promote start-ups/programs founded on a scientific discovery or meaningful engineering innovation to solve the big issues that really affect the world around through transformative technologies. The Deep Tech domains include: new materials, especially Materials of Intelligence, Artificial Intelligence, healthcare including Precision Medicine & Multi-omics, Cyber-security, Digital economy, Robotics, Advanced Communications, Quantum Computing, etc. Possible fields for Deep Tech applications include: Agriculture, Food (including processing, analytics and computing), Life sciences, Aerospace, Energy, Defence, etc. Currently the centre nurtures incubation projects supported by the Ministry of MSME and MeitY, Government of India besides administering a number of entrepreneurship related activities encompassing a multitude of programs/stakeholders in the neighborhood.

Present available infrastructure has around 21,000 sq. ft. of built up area dedicated for incubation and innovation along with other business support amenities. At any time, on an average 30 incubatees can be accommodated in the unit and they will have access to the laboratory facilities, faculty and managerial expertise, library & student interns available at the institute. A strong academia-industry linkage available with the institute will help incubatees in getting the domain specific dedicated mentorship and networking with potential business partners & customers. Apart from these, this unit provides trainings, connect with investors, intellectual property protection support and feedback/suggestions for their progress in terms of product development, testing and customer engagement. Three start-ups are already incubating their products and five more student/faculty led entrepreneurship projects have been approved recently by the ministry of MSME and BIRAC for pursuing incubation towards products/business development. Pingala AI Pvt. Ltd. (Prithvi.AI) -a provider of seed-stage acceleration program designed for budding start-ups in the Artificial Intelligence and machine learning arena -signed an agreement with IIT Jodhpur Technology Park on the 5th October 2020 and is setting up AIOT and Industry 4.0 support system 'HEEEAL' (Healthcare, Education, Energy, Environment, Agriculture and Livelihood) at the Innovation Centre in the unit.

Johari Digital Healthcare Limited (JDHL), Jodhpur –one of the first MDSAP and US FDA certified GMP audited manufacturing company in India working on designs, develops, engineers and produces electronic healthcare devices to be distributed worldwide – signed an agreement with IIT Jodhpur Technology Park on the 11th November 2020 and is also setting up a Centre of Excellence for Medical Technologies at the Innovation Centre in the unit powered by JDHL. An area has also been dedicated for setting of the first state-of- the-art bio-incubator in Rajasthan.

Start-ups already incubating are:

S.No.	Name	Email	Student/MSME/Faculty	Project/Product title	Status
1.	Dr. Suresh Dahiya	<a href="mailto:PG201282009@iitj.ac.in">PG201282009@iitj.ac.in</a>	Student led startup	Generic IOT Infrastructure (GIOTI)	Incubating
2.	Dr Saakshi Dhanekar	<a href="mailto:saakshi@iitj.ac.in">saakshi@iitj.ac.in</a>	Faculty under BIRAC awarded BIG project	Indigenous alcohol breath analyzer for prevention of drink and driving case	Incubating
3.	Prof. Mayank Vatsa	<a href="mailto:mvatsa@iitj.ac.in">mvatsa@iitj.ac.in</a>	Students and Faculty led startup	DependableVision.AI	Incubating

Student/faculty led entrepreneurship projects approved recently:

S.No.	Name	Email	Student/MSME/Faculty	Project/Product title	Status
1.	Dr. Amandeep Kaur	<a href="mailto:amandeepkaur@iitj.ac.in">amandeepkaur@iitj.ac.in</a>	Faculty under BIRAC awarded BIG project	An endoscopic camera system	Approved By BIRAC
2.	Mr. Vigyan Gadodia	<a href="mailto:gvigyan@gmail.com">gvigyan@gmail.com</a>	Student along with faculty advisor Dr. Ram Prakash	Design and development of small scale milk disinfection system using mercury-free plasma (MFP) UV Lamp technology	Approved By MSME
3.	Mr. S. Subburayalu	<a href="mailto:subburayalu@iitj.ac.in">subburayalu@iitj.ac.in</a>	Student along with faculty advisor Dr. Ravi K. R.	Development of Transparent, Durable superhydrophobic-coating for self-cleaning of Endoscope	Approved By MSME
4.	Mr. Bibhudutta Satapathy	<a href="mailto:satapathy.1@iitj.ac.in">satapathy.1@iitj.ac.in</a>	Student along with faculty advisor Dr. Deepak Mishra	A Wellness Device for Real-time Non-contact Blood Oxygen Saturation Measurements	Approved By MSME
5.	Mr. Varun Kumar	<a href="mailto:kumar.129@iitj.ac.in">kumar.129@iitj.ac.in</a>	Student along with faculty advisor Dr. Amandeep Kaur	Human perception driven on-chip compression for power efficient CMOS image sensors	Approved By MSME

## **Engagement with Industries**

The Institute is engaging with industries and other academic and research organizations to encourage delivery-based research activities. The Institute has made significant efforts to connect with the industry during the past one year by signing agreements with leading industries. Some of the prominent engagements of the Institute with companies are with Cognizant Technology Solutions India Pvt. Ltd.; with Robosurg Med-Tech Pvt. Ltd. to provide research advisory and conduct activities related to SSI robotic Project; with PhiMetrics Telecom Value Added Services Pvt. Ltd. for the research project titled “Voice and Video Analysis”; with BlockApps AI Private Limited, Bangalore for Development of Segmentation Algorithms for Surveillance and AI-assisted Health Diagnosis; with TRS Solutions LLP for collaborative research in the area of Artificial Intelligence in Medical imaging to advance radiology diagnostic capabilities; with GE India Industrial Pvt. Ltd.; Samsung India Electronics Private Ltd.; with Heart-health Technologies Private Limited, for Use of Technologies in Medical Image Analysis, Diagnosis and Prognosis; with Johari Digital Healthcare Ltd., to promote and facilitate Innovation, Commercialization and Mentorship of the Projects undertaken the aegis of JCoE and find solutions to specific problems in the area of Medical Devices and Technologies; with Oil India Limited to collaborate for promotion of research, innovation and education and provide a model for industry-academia partnership.

## **Technology Transfers**

During May 2020, the Institute has developed “Advanced Photocatalytic Oxidation Sterilization System Based on UV-Light and Metal Oxide Nanoparticles Catalyst to treat N-95 Filtering Face-Mask Respirators for reuse” and transferred the technology to several companies, namely, ISCON Surgicals Ltd. Jodhpur, Kamtech Associates Private Limited, Chempharm Industries India Pvt. Ltd., Parappadi Technology Private Limited, Johari Digital Healthcare Limited, Zentix Blue Ocean Pvt. Ltd. (Jaipur), and to Mai Bharat.

Also, the Institute developed G Filter, a low-cost water filter which can be made by local Indian potters through indigenous technology using only locally sourced raw materials. M/s. Watsan Envirotech Private Limited has tied up with the Institute for Improvement of formulations

and performance based on various types of water alleviations, using different models of G filters across India, and additionally modified with different variations of carbon/graphite nanostructures coated and tried on various substrates other than G filters, for creating filters and filter mediums.

Further, the IITJ Technology Park has tied up with city based Johari Digital Healthcare Ltd.(JDHL) to cooperate for the purpose of (i) practicing and encouraging technology transfer and commercialization of innovations to increase research related economic growth in regions country and the oversea, (ii) identify and seek out joint business opportunities through national and International networking, and (iii) work out a common yearly planning for activities and 'Match Making' events to be shared also with local economic promotion agencies, start-ups (iv) Leverage the expertise of Knowledge Partners in Healthcare, Environment and Livelihood.

## **Faculty Recognition**

The Faculty Members of IIT Jodhpur earned several awards and recognitions this year. IIT Jodhpur honoured several of its Faculty Members with teaching excellence and research excellence awards this year. Teaching excellence awards 2020 were conferred on Dr. Sandeep Yadav, Department of Electrical Engineering; Dr. Anand Mishra, Department of Computer Sciences; Dr. Deepakkumar M. Fulwani, Department of Electrical Engineering. The Institute recognized excellence in young researchers Dr. Amit Mishra, Department of Bioscience and Bioengineering and Dr. Somnath Ghosh, Department of Physics for their contributions in neurobiology and optical fibers respectively. Senior researchers Dr. Mahesh Kumar, Department of Electrical Engineering and Dr. Subashish Banerjee, Department of Physics won the research excellence awards for their contributions in sensors and quantum systems respectively.



Also, several Faculty Members were recognized for their research contribution in their respective fields:

1. Professor Surajit Ghosh from the Bioscience and Bioengineering department was awarded the CDRI Award 2020 for Excellence in Drug Research. Professor Surajit Ghosh was also awarded the SERB - Science and Technology Award for Research (SERB-STAR) award for 2020.
2. Professor Richa Singh, from the Department of Computer Science and Engineering was named an IEEE Fellow for her outstanding contributions in robust and secure biometrics. Prof. Richa Singh also won the Audience Choice Best Presentation Award at IEEE International Joint Conference on Biometrics, 2020.
3. Dr. Kaushal A. Desai and his team of students (Parth Joshi, Poojan Gajjar) in collaboration with Dr. Prathamesh H Kamble, AIIMS Nagpur, won the annual SITARE- GYTI & SRISTI GYTI-2020 Award for an innovative project titled "Development of Electro-Mechanical Muscle Fatigue Measurement Device" on 5-11-2020 by Dr. Harsh Vardhan, MOHFW, GoI.
4. Dr. Harshit Agarwal from the Electrical Engineering Department won the 2020 IEEE Electron Devices Society Early Career Award.
5. Dr. Ritu Gupta from the Department of Chemistry was recognized by the Indian National Science Academy (INSA) by means of a Young Scientist Award 2020 in Chemical Sciences.
6. Dr. Neha Jain from the Department of Bioscience and Bioengineering won an EMBO Travel Award to attend the EMBO workshop on Intrinsically Disordered Proteins: From molecules to systems in December 2019.
7. Dr. Sandip Murarka, Department of Chemistry has been elected as a Fellow of Indian Chemical Society (FICS). The Indian Chemical Society, founded by Prafulla Chandra Ray is one of the oldest chemical societies of India.
8. Dr. Soumava Mukherjee, Department of Electrical Engineering has received the European Microwave Conference Student Award in EuMC 2020, Utrecht, Netherlands.
9. Dr. Priyanka Singh, Assistant Professor, received the highly prestigious "Har Gobind Khorana-Innovative Young Biotechnologist Award for the year 2019" from the Department of Biotechnology (DBT), Government of India.

10. Dr. Sumit Kalra, Department of Computer Science and Engineering received an IMPRINT Sponsored Project Award from SERB.
11. Professor Richa Singh and Professor Mayank Vatsa were recognized with Ethics in AI Award from Facebook
12. Dr. Prasenjeet Tribhuvan, Department of Humanities and Social Sciences, was awarded a Fellowship at the Indian Institute of Advanced Studies, Shimla
13. Dr. Jaiveer Singh, Department of Mechanical Engineering, serves as a Board Members, National Advisory Board of the “International Conference on Advances in Materials Processing and Manufacturing Application (iCADMA 2020)” sponsored by SPARC, MHRD India and organized by MNIT Jaipur.
14. Dr. Shobhana Singh, Department of Mechanical Engineering was awarded the DUO-India Professor Fellowship Award during 2020 by ASEM, South Korea
15. Dr. Rahul Chhibber, Department of Mechanical Engineering received the Best Poster Award in Entrepreneurship Section, Industry Day 2020, IIT Jodhpur.
16. Dr. Satyajit Sahu, Department of Physics, was awarded the BRICS Young Researcher fellowship for attending the BRICS conclave in Russia

### **Editorial Appointments**

Institute Faculty Members were appointed to various editorial positions in reputed journals in their respective domains. A few of these appointments are:

1. Professor Surajit Ghosh, Department of Bioscience and Bioengineering was appointed as Associate Editor for RSC Advances, UK.
2. Dr. Jai Narayan Tripathi from the Department of Electrical Engineering has been appointed as the Associate Editor for IEEE Transactions on Components, Packaging and Manufacturing Technology.
3. Professor Richa Singh, Department of Computer Science and Engineering was appointed as (i) Associate Editor-in-Chief, Pattern Recognition. (ii) Associate Editor, Computer Vision and Image Understanding. (iii) Vice President of Publications, IEEE Biometrics Council. (iv) Program Co-Chair, IEEE International Joint Conference on Biometrics, Houston, USA.

4. Professor Mayank Vatsa, Department of Computer Science and Engineering was appointed as (i) General Co-Chair, IEEE International Joint Conference on Biometrics, Houston, USA, during September 2020. (ii) Program Committee Co-Chair, IEEE International Conference on Advanced Video and Signal based Surveillance, 2021. (iii) Associate Editor, Pattern Recognition. (iv) Area Editor, Journal of Information Fusion.
5. Dr. Gaurav Bhatnagar has been appointed as Guest Editor for the Special Issue on "Recent Trends in Multimedia Analytics and Security" in IET Image Processing, March 2020
6. Dr. Mahesh Kumar from the Department of Electrical Engineering is serving as a Member of the Editorial Board of Nano Express and as an Associate Editor for Frontiers in Sensors
7. Dr. Ritu Gupta is serving as a Member of the Editorial Community Board of Materials Horizon Journal, Royal Society of Chemistry.
8. Dr. Raviraj Vankayala, Department of Bioscience and Bioengineering, served as a Guest Editor in MDPI Bioengineering journal for a special issue entitled "Engineering Novel Multifunctional Nanostructures for Various Biomedical Applications".
9. Dr. Ananya Debnath, Department of Chemistry has been appointed as Review Editor in the Editorial Board of Biophysics, (a specialty section within Frontiers in Physics, Frontiers in Physiology and Frontiers in Molecular Biosciences).
10. Dr. Indranil Banerjee, Department of Bioscience and Bioengineering, has been appointed as an Associate Editor for the Journal Frontiers in Medical Technology

## **International Relations**

The institute made significant efforts towards internationalization of academic programs and research activities during last one year. The Institute established the Office of International Relations to meet these objectives and sustained efforts were made to increase the strength of foreign students on campus in various academic programs. The institute participated in various initiatives of GoI such as Study In India (SII), ASEAN fellowship, ICCR, MEA etc. which resulted into considerable increase in the strength of foreign students on campus during 2020. The institute signed MoUs with

top foreign universities such as University of Western Australia (UWA), Deakin University (Australia), La Trobe University (Australia), Lobachevsky University (Russia), Université de technologie de Troyes (France) in 2020 to facilitate the exchange of students and faculty members. The collaboration with some of these foreign universities aim at strengthening academic programs and research activities in the emerging areas such as, Artificial Intelligence, Data Science, Cyber-Physical Systems, Sustainable technologies and Smart Manufacturing. The institute aims to initiate joint academic programs, joint research guidance and upskilling programs for working professionals in collaboration with foreign universities in the coming years. The faculty members and students are actively participating in joint research as well as scholarship schemes through Shastri Indo-Canadian Institute, ASEM-DUO, GIAN, SPARC to enhance international research collaborations and output.

## **Alumni Affairs**

The Institute values its alumni and remains proud of their accomplishments since their graduation. By setting up the IIT Jodhpur Alumni hub, the Institute has reconnected with its Alumni and has engaged with them purposefully on several fronts. On 25<sup>th</sup> January, 2020, the Institute celebrated its first Alumni day. This event saw enthusiastic participation from our Alumni, who visited the Institute and relived the memories they created while at IIT Jodhpur. The event was also graced by representatives from PanIIT Alumni and other distinguished guests. In another first, the Institute conferred the Recognition of Excellence in Young Alumni (REYA) award to Mr. Shobhit Srivastava (Class of 2012, CSE) and Mr. Siddarth Jain (Class of 2014, ME) for demonstrating excellence in the Entrepreneurship and Social contributions categories respectively. In another moment of pride for the Institute, our Alumni, Mr. Lal Chand Bisu (Class of 2012, EE), Mr. Vinod Meena (Class of 2014, CSE), and Mr. Vikas Goyal (Class of 2014, CSE) were featured in the Forbes 30 under 30 Asia list, under the category “Media, marketing & advertising” for co-founding Kuku FM, which has re-envisioned traditional radio. The efforts are ongoing to setup the IIT Jodhpur Alumni Association to reconnect with the alumni effectively. It is expected that the process of registering the

Alumni Association will be completed by early 2021 which will help in sustained engagement of alumni with the institute.

## Outreach

### Water Purification Initiatives in Rural and Remote Areas

Water contamination due to fluoride is common, particularly in rural and remote areas of Rajasthan. Pressure driven membrane processes play an important role in water purification. Microfiltration (MF), Ultrafiltration (UF), Nanofiltration (NF) and Reverse Osmosis (RO) are the main pressure-driven membrane processes.

Table 1: Important Characteristics of Pressure Driven Membranes

S.No.	Characteristics	MF	UF	NF	RO
1.	Pore size (A)	1000-2000	20-1000	10-20	5-10
2.	Driving force required (bar)	0.1-0.3	0.3-5	5-15	15-50
3.	Application in water treatment	Suspended solids removal	Removal of bacteria, virus, high molecular weight contaminants	Removal of multivalent ions and mid-size organic substances	Removal of monovalent ions

As a part of social scientific outreach to address the drinking water contamination issues in rural areas, a decentralized water purification unit was designed for fluoride removal. The ultra-filtration membrane assisted sorption process which runs by gravity was used. It does not require electricity for water purification. IITJ installed and demonstrated the low cost, highly effective indigenous decentralized solution to provide clean drinking water in rural areas of Rajasthan particularly in schools. These interventions using UF technology have been carried out in three locations of two districts namely Sirohi and Jhunjhunu, in the first phase.

For this purpose, the site selection was carried out in consultation with District Authorities and Public Health Engineering Department (PHED) and a Government Primary School of Kharaat village in Sirohi District was selected. Kharaat village is located on NH 14, two kilometres away from Ore in Pindwara Region, Sirohi.

After carrying-out water analysis, appropriately designed water purification unit based on membrane assisted sorption process was installed. Raw water and product water tanks along with pipe and fittings were also installed for the collection of ground and purified drinking water. The unit is ideal for rural areas and remote locations. It provides purified clean water to school children, free from fluoride contamination as well as secondary contaminants like bacteria, virus, turbidity, suspended solids, colour and odour.

The installation of another water purification unit was carried out at Rajkiya Uch Madhyamic Vidyalaya (Government Higher Secondary School) in Dhanuri village of Sirohi district.

Another installation of the UF water purification unit was carried out in Rajkiya Uch Madhyamic Vidyalaya (Government Higher Secondary School) at Luna village in Jhunjhunu. It provides good clean drinking water to the students and staff members.

Local participation of teacher, staff and students was ensured in installation and operation of the water purification unit. This helps in operation and maintenance (O&M) by the users at lowest appropriate level as well as adequate capacity building.

School students are introduced to practical aspects of education in this unit, which is not very common in primary schools. This acts as an introduction to skill development at primary level itself as well as set an example as novel integrated approach to decentralized community managed system and sustainable water management.

### **Unnat Bharat Abhiyan (UBA)**

UBA activities had been this year more towards reaching out to the far districts such as Jaisalmer, an Aspiration district mentored by us. We visited the faculty member of Government

Polytechnic College on 14<sup>th</sup> February 2020. The second district and instate covered was Government Engineering College, Barmer. Here a one-day long workshop on February 15, 2020 was organized for the students to understand about UBA Program. With March 2020, the visit directions were changed from West to the North. Out student teams visited Jhunjhunu to villages of Luna and Dhanuri under the guidance of Prof. Pradip Tewari. Here during March 19 and 20, 2020 installation of Ultra Filtration devices at Schools in adopted villages by Jagdish Prasad Jhabarmal Tibrewala University (JJTU) were conducted. Here JJTU invested financially to adopt it in the schools. With CoVID-19, sweeping across some of the proposed visits to other districts were cancelled and visits within Jodhpur were increased. The team visited Jodhpur Institute of Engineering Technology, in Jodhpur and met with UBA PI and request to help promote CoVID-19 awareness in its villages.

Online mode of interaction was practiced. Dr. Kuldeep Singh from AIIMS Jodhpur (UBA participating Institute PI) conducted talks to elaborate serious problems that people can get into if they did not follow social distancing and use of mask was conducted.

With CoVID-19, the work become virtual as well as on specific location oriented. With the help of Village Rudiya, under UBA PI and Associate Professor at Department of Chemistry, a big project on providing mask to people was conducted at Ruidya village by teaching the potter at Rudiya village to make clay ceramic mask and distribute among people in Rudiya and Kalawas villages which were adopted by IIT Jodhpur.

More than 800 masks were manufactured and distributed by Mr. Ruparam for a span of two months. This ceramic mask campaign got districts attention and Mr. Ruparam was awarded for his selfless distribution of masks across UBA adopted villages in Bhopalgarh block by district administration. Now the mask project has been approved as a 6 month UBA SEG research project for which IIT Jodhpur received a supporting UBA project of Rs 89,000. The PIs of the project are Dr. Rajendra Nagar, Dr. K. R. Ravi, Dr. V. Narayanan, and Dr. Anand Plappally from IIT Jodhpur.

Similarly, the technology was also transferred to Potter in Salawas, which was under Aishwarya College (UBA PI) Jodhpur. Dr. Anjana Vyas contacted IIT Jodhpur about the technology and requested its use under the UBA RCI mentorship program. Here open hearth furnace in potter

households were used to manufacture masks. This technology was advertised very well by Aishwarya College Jodhpur and thus it received the most coveted UBA SEG Perennial fund award of Rs. 1.75 Lakhs for fighting CoVID-19 through their participation at *Unnati Ki Kahani-Chitron Ki Jubani* by National Coordinating Institute UBA, IIT Delhi.

Another project funded by UBA -SEG for about 1 Lakh has been awarded to Dr. Mahesh Kumar (Mentoring Jhunjhunu District) from Department of Electrical Engineering, IIT Jodhpur for the manufacture of low-cost ventilator.

### **Scientific Social Responsibility in Nearby Villages through the Centre for Emerging Technologies for Sustainable Development (CETSD)**

In this regard, the first kitchen garden was started during the pandemic to solve the problem of providing balanced nutrition to the students in the Dr. B R Ambedkar Government Hostel at Jheepasni Village. Kitchen garden was established at the first hostel at Jheepasni Village as a model. These hostels are under the Social Security and Empowerment Department of the Government of Rajasthan. The kitchen garden developed here is based on organic farming technology of sub surface porous vessel irrigation with hybrid composting developed at IIT Jodhpur.

The kitchen garden enabled the hostel to be self-sustaining in terms of vegetables for its kitchen and mess. It enabled social distancing by decreasing the frequency of hostel officials visting to the markets to by vegetables. This reduced the chances of these officials coming in contact with possible CoVID-19 carriers. The hostel also was able to provide balanced diet according to seasonal needs by growing what they wanted. The Social Security and Empowerment Department of the Jodhpur block is planning to start other kitchen gardens in all its hostels across Jodhpur after reaping a very good produced after the first 6 months of the project now. The second season of winter crops have been planted at hostel at Jheepasni village besides our Karwar campus.



## **The Sirohi Model**

IIT Jodhpur adopted the aspirational district of Sirohi in Rajasthan last year to develop it as a model district and extend its technological solutions to grass roots in the hills and desert area of Rajasthan.

The area of Health care, disease prevention technologies, Water and Agriculture have been penetrated and put on the ground. Towards the disease prevention in the mining section stone-dust precipitator systems have been developed to capture and precipitate the stone dust in collaboration between IITJ and CEERI Pilani.

Further the Institute of Genomics and Integrative Biology (IGIB), New Delhi, IITJ and AIIMS, Jodhpur, have come together to offer an AI based solution for identification of silicosis and tuberculosis which form the major forms of ailments among the mining community. Clinical as well as imaging solutions with telemedicine has been brought together by the collaborators to help the silicosis and tuberculosis patients coming to General Hospital at Sirohi and Primary Health Center at different location including Pindwara. Lung imagery from more than 400 patients have been scanned and analyzed in regard. Here IGIB also brings in Ayush-Genomic perspective to the treatment with this collaboration.

Into the area of water purification in the grass root locations in Pindwara, Sirohi affected with fluoride and microbes, a patented ultrafiltration solution has been extended from IIT Jodhpur. Primary schools such as one at Kharaat Village, Pindwara is enjoying the technological intervention from IIT Jodhpur for the last one year. Here the Department of Water at the Office of the District Collector played a collaborative role.

In this project Sirohi administration has closely collaborated with IIT Jodhpur with future plans of introducing technological solutions to the governance aspects in the Sirohi District.

Further the latest technologies in subsurface irrigation has been extended to farmers at Esau and Ajari villages in Sirohi. Here the Office of Agriculture (ATMA) played a collaborative role to hand hold IITJ engineers to reach the needy farmers. Further dew catching technologies have been

also installed in Rajhans Nursery at Mt. Abu with more than 1.5 liter per square meter water production in these winter times.

## **Conferences and Workshops**

National Conference on Quantum Information and Computation (QIC) was organized during 08-11 December 2019 by the QIC group at the Department of Physics and supported by IIT Jodhpur, Defence R&D Organization (DRDO), Advanced Photonics Mumbai, QNu Labs Bangalore, ATOS Bangalore, Spectral Instruments System Gurgaon. The conference aimed at introducing the fundamental concepts and multidisciplinary applications of Quantum Information and Computation and at discussing state-of-the-art in the area with eminent speakers in this domain along with upcoming researchers.

The 11<sup>th</sup> International Conference on Intelligent Human Computer Interaction (IHCI 2019) was jointly organized by Indian Institute of Information Technology Allahabad (IIITA) and Indian Institute of Technology Jodhpur during 12-14 December 2019 at IIIT Allahabad. It was chaired by Dr. Gaurav Harit from Department of Computer Science and Engineering at IIT Jodhpur.

The 64<sup>th</sup> DAE Solid State Physics Symposium was organized during 18-22 December 2019 at IIT Jodhpur by Bhabha Atomic Research Centre (BARC), Mumbai, sponsored by the Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy, Government of India.

The Institute hosted *The Explorer Series*, a popular science talk series designed by the biomedical research-funding charity *The Wellcome Trust/DBT India Alliance*, on 6 January 2020, to inspire young students to the excitement and value of science. Four scientists, namely, Dr. Kavita Babu from Indian Institute of Science, Dr. Tavpritesh Sethi from IIIT Delhi, Dr. Shankar Manoharan from IIT Jodhpur, and Dr. Geeta Trilok-Kumar from Institute of Home Economics, New Delhi, took close to 200 school students and undergraduates through their adventurous journeys as scientists. Their talks covered varied scientific topics, from neuroscience and microbiology to nutrition research and artificial intelligence in medicine. Students from Mayo Chhapasni School, Army

Public School and Delhi Public School, Jodhpur attended the event, asked pertinent questions and interacted with the researchers. IIT Jodhpur also gave away origami microscopes for the school students, who asked the best questions in the event.

The Institute hosted a *Science Communication* workshop organized by the *Wellcome Trust/DBT India Alliance* for young researchers in and around Jodhpur on 7 January 2020. About a hundred early-career researchers from various institutions in and around Jodhpur, like, AIIMS, Jodhpur; JECRC, Jaipur; DMRC; JNVU; MBM engineering college; Shaheed Bhagat Singh College, PSG college of Technology, attended the workshop. A team of *India Alliance* representatives including Dr. Sarah Hyder Iqbal, Dr. Madhankumar Anandhakrishnan, Ms. Yukti Arora, Dr. Hina Lateef Nizami and Dr. Divya Tiwari organized sessions on research ethics, science communication, presentation skills, CV & cover letter preparation and manuscript writing. All attendees were briefed about the early-career research funding opportunities offered by the India Alliance. A session on crafting a successful grant application was also organized.

Technology and Innovation Support Centre, Department of Science & Technology, Government of Rajasthan organized an *Advance Workshop on "IP, Technology Transfer & Licensing"* during 16-18 January 2020 at IIT Jodhpur. Combining the concept of the technology transfer with IP creation and licensing, this workshop touched upon the relevant legal, practical and economical aspects. Also, it covered the key issues to be taken into account by companies/startups through the different stages of the product development cycle and during the IP commercialization process.

IIT Jodhpur organized an International Workshop on Science of Intelligence during 18-19 January 2020 in collaboration with IIT Delhi. The aim of the workshop was to converge, in coordination with researchers across the country, to formulate a program on the Science of Intelligence. This two-day event, organized by the Institute's Interdisciplinary Research Group on Cognitive Science, has witnessed expert lectures and panel discussion by eight eminent scientists and speakers on cognitive science and artificial intelligence from around the world. The workshop aimed to address core questions about intelligence – its nature, how it is manifested in living systems and how it could be implemented in machines. Experts like Smt. Mugdha Sinha, Secretary to Government, Department of Science and Technology, Govt. of Rajasthan; Prof. Manas Kumar

Mandal, Distinguished Visiting Professor, Department of Humanities and Social Sciences, IIT Kharagpur; Prof. Neeraj Jain, Director, National Brain Research Centre; Prof. Laxmidhar Behera from IIT Kanpur, Prof. Pawan Sinha from the Massachusetts Institute of Technology (MIT), USA; Prof. Srinivasa Chakravarthy from IIT Madras; Dr. Sharba Bandyopadhyay from IIT Kharagpur, were a part of this workshop.

The State Government of Rajasthan, keeping in mind the requirement of the State for new jobs creation through planning and execution of the S&T Schemes, constituted an expert committee under the Chairmanship of the Secretary, Department of Science & Technology, Government of Rajasthan, which includes Director-IIT Jodhpur, Director-IIM Udaipur, Director-AIIMS Jodhpur and 5 (five) Subject Professionals from the fields of agriculture, education, medical and health skill development, employment and entrepreneurship. The committee has been assigned to lay down guidelines and develop a vision document in coordination with the subject experts. A Nodal officer for this program has been appointed from the State Department of Science & Technology, Government of Rajasthan. The Secretary, DST, GoR has sought from all District collectors to identify the S&T needs and suggestions for their districts. Also, all universities in the state have been requested for gap analysis/problems identification in their respective districts in which they are situated. Chaired by Mrs. Mugdha Sinha, IAS & Secretary, DST, Government of Rajasthan, the expert committee met at IIT Jodhpur on 18 January 2020 to discuss *Mapping of Science and Technology Needs of the State*. The main motto of the program is to develop new guidelines and vision document for the Rajasthan state regarding a systematic and sustainable program, which will create and open new doors for the young entrepreneurs. The program, in times to come, is hoped to be helpful in eradication of poverty and will improve the livelihood in the State.

Data science is an emerging field with a plethora of opportunities in biology. In the near future, biological data is expected to dominate the data science field. Taking cognizance of this, IIT Jodhpur co-organized the *1<sup>st</sup> International Conference on Data Science in Biology (ICDSB)* during 3-5 September 2020. Invited experts from academia and industry working in the data science domain with inclination toward solving biology related problems participated in the event. Renowned speakers from institutes like Harvard Medical School, USA; German Cancer Research Center

(DKFZ), Germany; Zefat Academic College, Israel; Indian Institute of Science (IISc) and Macquarie University, Australia, shared their research work and experience with the participants. Additionally, to prepare a background in these fields a one-day workshop was organized on 3<sup>rd</sup> September by expert instructors from academia and industry.

In addition, Faculty Members of the Departments invited several eminent scientists and academics during this year to deliver special lectures and for review of curricula of various academic programs hosted by the Institute.

## **Student Achievements**

This year, students of the Institute received their share of accolades too. While this is not an exhaustive list of the achievements of the undergraduate and postgraduate students, here is a sneak peek into their achievements.

- (1) The 8<sup>th</sup> Inter IIT Tech Meet was hosted by students from IIT Roorkee, from 20-22 December 2019. IIT Jodhpur students attended the 3-day meet along with 23 other IITs to find feasible solutions to real-life industry problems posed by DRDO SASE, BITGRIT Japan, and The Ashoka Foundation. IIT Jodhpur secured 2-bronze medals and 1-silver medal.
- (2) A contingent of 127 students represented IITJ in the Inter IIT Cultural Meet 4.0 held at IIT Bombay. The team participated in almost all competitions showcasing dance, music, drama, fine arts, quizzes, literature, and many more. The team stood at 12<sup>th</sup> position overall among 19 participating institutions. Some noteworthy achievements were 4<sup>th</sup> position both in Group Dance and Theatre competitions.
- (3) This year, M.Sc. Chemistry Students, Bhawna Mishra and Purva receive prestigious PMRF Fellowship.
- (4) Gaurav Bahuguna and Mohit Verma were awarded the best poster presentation at Industry Day 2020 organized by IIT Jodhpur.
- (5) Harsh Kooshal Gandhi, Department of Electrical Engineering authored a paper in the journal "Optics Express", which was featured as the Editor's pick.

- (6) A team comprising Smita S., Parth P., Laxmikant D., led by Dr. Hardik Kothadia, Department of Mechanical Engineering, won the Best Poster Award at the Industry Day 2020, IIT Jodhpur
- (7) Ms. Sunidhi Dayam, a Ph.D. student at the Department of Mechanical Engineering, working with Dr. Kaushal A. Desai, has designed a face shield using the scrap material available at home. Her design was appreciated by the Collector and Doctors of Nagaur district. The Collector released the face shield design during a press conference on 03 April 2020. Now the design is being sent to the local vendors, and she will guide them for large scale production. Sunidhi has already provided 40 face shields to the district hospital. Using this design, face shield masks can be manufactured at any small shop or even at home by a layman.
- (8) IIT Jodhpur organized a series of summer challenges for its students. These included Authoring new encyclopaedic content, Data Analytics / Discovery, Discovering the Artist in me, Ideation, Effective teaching, and Literally viral. Several students across branches won cash prizes, merit certificates and credits in their respective programs for their outstanding contributions
- (9) The Rotaract Club of IIT Jodhpur received the highly prestigious 2019-20 Rotary Presidential citation with platinum distinction certified by rotary head office, USA. The PLATINUM distinction is the highest rank of citation which is important for every Rotaract club across the globe. It has been an honour for the Rotaractors at IITJ for having successfully achieved their goals by earning the citation for the club.

## **Career Development and Placement**

The Career Development Cell (CDC) at the institute offers support to students for excelling in the career path. A team of faculty and staff members at CDC are making sustained efforts to establish processes for the career development plan to facilitate the training of students for both short and long-term career goals. This includes internship opportunities to the placement planning, application process until the final offer and strategic support to the students. CDC focuses on nurturing technical and interpersonal skills by arranging training courses, lecturers by eminent

speakers, and up-to-date seminar concepts. In addition, CDC is actively engaged in developing symbiotic relationships with a broad spectrum of companies through industrial projects, visits, and professional networking. I am happy to state that more than 70 companies visited the campus during the year 2019-20. Some of the key campus recruiters include Tata Consultancy Services (TCS), L&T Engineering, Microsoft, Google, Amazon, Morgan Stanley, Goldman Sachs, Jaguar Land Rover, Maruti Suzuki, HPCL, Oil India, etc. that offered internship and placement opportunities for graduating engineers and researchers.

Academia was no exception when pandemic CoVID-19 distressed the entire world. Despite the adversities, CDC swiftly transitioned its action plan and activities to an entirely online mode. The CDC recognized a contemporary alumni contact network in line with the existing placement structure. The ongoing efforts will expand the career opportunities for students and induct strategic relationship of IITJ with potential industries and organizations. As an interface to career prospects, CDC is determined to provision unique talent, knowledge, and technology transfer in India and abroad. Moreover, CDC is working persistently to sustain the unforeseen challenges and provide IITJ students with every possible avenue for professional growth.

## **Campus Development**

Sprawling over 852 acres in three Pockets of Land Located on NH-62, Jodhpur-Nagaur Highway, 25 Kms away from the heart of Jodhpur city. The Campus was awarded a 5-star rating by the Green Rating for integrated Habitat Assessment (GRIHA) council for its scrupulous planning. The ecological, cultural & social values associated with this site is protected by taking inspiration from the vernacular building layouts, design elements & treatments for the Campus Landscape & architecture. The planning of the Campus aims to reach Net-zero Energy, Water & Waste, making the Campus self-sustainable. The other salient features of the Permanent Campus are:

- (1) Walking campus, which is pedestrian oriented and bicycle dominant;
- (2) Learning facilitated anywhere, any time with wireless ICT backbone (including Multi-media enabled learning spaces with flexible, shared public spaces);

- (3) Thermally comfortable smart buildings with GRIHA 4/5-star compliant buildings and GRIHA LD benchmark campus (including dense desert settlement morphology, low height buildings (up to a maximum of 3 storeys) built with low embodied energy materials, and improved local and traditional methods);
- (4) Plantation with native species, soil stabilization, protection from dusty wind to arrest erosion, desertification, and building-up soil moisture over time;
- (5) Rain water harvesting and water reduction and sewage recycling, together greening the site over time; and
- (6) Segregated wastes and customized recycling.

The houses at IIT Jodhpur are spacious and comfortable. Currently, the campus has a capacity of 132 flats for Faculties and Officers along with 84 flats for Staff members. 2280 student-capacity hostels are already available with one more 240-seater hostel under construction. Single AC room Accommodation and dedicated 3 storied air-conditioned Dining Hall Building serves to a comfortable stay at IIT Jodhpur Campus to the students. The Dining Hall has a mess and a canteen which takes care of the nutritious & hygienic food to the students as well as other residents.

The Infrastructure at IIT Jodhpur Campus caters for all the essential requirements of the residents like an ISO: 9001 certified Primary Health Centre, Community Centre with shopping services, residential parks with open gyms etc. facilitates all the requirement of the IIT Jodhpur fraternity.

Developed in 3 parcels of land, presently the construction is done in only two pockets namely Pocket A & B. The buildings which are complete & used for its Administrative, Academic & Research Activities are:

- (1) Main Building, housing all the Administrative Offices of the Institute along with the School of Management & Entrepreneurship;
- (2) The Learning Hub, housing the Library of the Institute and accommodating the Computer center;



- (3) Lecture Hall Building with 8 class rooms of 60 seating capacity, 02 class room of 120 seating capacity and a 325 and 650-seater classroom each. All the classrooms are air conditioned, equipped with modern learning facilities like the Internet and audio-visual facilities;
- (4) The Basic Laboratories are established in one building;
- (5) Department of Computer Science & Engineering (CSE) Building houses the Departments of CSE, Mathematics and Humanities & Social Sciences. Also, the laboratories of Computer Science & Engineering are established in this building;
- (6) Department of Chemistry and Bioscience & Bioengineering are house in the building of Department of Chemistry;
- (7) Department of Electrical Engineering and Physics share the space in the building of Department of Electrical Engineering;
- (8) Department of Mechanical Engineering also houses the newly established Department of Metallurgical & Materials Engineering and Department of Civil and Infrastructure Engineering;
- (9) Department of Chemical Engineering;
- (10) Incubation and Innovation Centre.

There are various other Buildings which are under Construction in the Phase 2 development of Permanent Campus of IIT Jodhpur & likely to be completed soon. These buildings are:

- (1) Department of Physics;
- (2) Department of Metallurgical & Materials Engineering;
- (3) Department of Bioscience & Bioengineering;
- (4) Central Instrumentation Facility;
- (5) U.G. Workshop Building;
- (6) Semi-Permanent Building for Animal House & School of Management & Entrepreneurship;
- (7) Laboratories for Civil & Infrastructure Engineering and Chemical Engineering, Research Labs, Gymkhana and other common facilities (Berms).

A Separate Sports Zone is developed to provide excellent Sports Facilities to the students as well as Faculty and Staff Members. The playing facilities presently developed are:

- (1) Cricket Ground with separate practice pitches;
- (2) Foot Ball Ground;
- (3) Hockey Ground;
- (4) Synthetic Basket Ball Courts;
- (5) Synthetic Lawn Tennis Courts; and
- (6) Synthetic Athletic Track;
- (7) Volleyball Ground; and
- (8) Kabaddi Ground

Along with above, there is a modest facility of Badminton Courts, Indoor Table Tennis and Gymnasium in each hostel. Indoor Sports Stadium: with provision of Badminton Courts, Squash Courts, Table Tennis Facility, Gymnasium and other Indoor Sports Facility is currently being constructed.

On October 16, 2020, Dr. Ramesh Pokhriyal “Nishank”, Hon’ble Shiksha Mantri, Government of India, inaugurated two facilities namely Innovation & Incubation Center and Sports Complex in the Permanent Campus of IIT Jodhpur.

## **Strategic Plan**

We are living in an era of exponential change. Emerging technologies are leading to many of these changes and disruptions. Fusion and convergence of technologies is blurring the lines between the physical, digital, and biological spheres. Technological research is impacting life, societies, economies and the planet (environment, ecology) more and more. High quality holistic education has acquired unprecedented importance in improving the lives and future of the people. Shift in nature of work, move towards use of immersive media for blended teaching, and growing societal expectations are all calling for a total rethink. The New Education Policy has set the framework for IITs also to reimagine the current models, and grow into future-ready broad-based technology

institutes with innovative financial strategies. Vision and Strategy for the 5 years 2021-2025 has been crafted for IIT, Jodhpur accordingly, using four steps namely “Reimagine, Redefine, Disrupt, Innovate”.

Vision and Strategy 2021-25 document charters a path to broaden the existing vision and mission of IIT, Jodhpur, to be implemented through strategies rooted in the needs of tomorrow. Vision statement, developed through an internal consultative process using foresighted approach, reflects the proposed nature of the institute; it is envisaged as a future driven knowledge institute, with emphasis on use of Transformational Technologies and Interventions with a multidisciplinary approach. The Vision has been translated into a Mission with a five-point Mandate, and a Strategic Architecture to create a holistic institute for knowledge creation and dissemination of all traditional and emerging technologies and their fusion, and its application for national and societal purposes in diverse areas like industry, economy, sustainability, environment and critical problem-solving (grand challenges), along with capitalizing on emerging opportunities.

The Mission will be achieved through eight Goals. These Goals relate to Curriculum, Pedagogy, Research, Institutional Collaboration, Industry Connect, Infrastructure, Organizational Culture & Processes and Financial Security. The main objectives relate to offering a flexible curriculum, enhancing translational research ecosystem, inculcating professional internal culture, efficient collaboration with industries and institutions, fostering humanitarian values and passion for learning and to develop socially responsible faculty, students and future leaders, committed to create a self-reliant India.

The Goals have been further detailed into subgoals, each with clear targets, KPIs and strategy. The Strategic Architecture takes cognizance of the inherent interlinkages between different Goals and different units of the institute. This document will, therefore, be supplemented by duly dove-tailed Vision and Strategy documents of all academic and other units, which will be prepared and implemented by the units themselves within this Architecture. The document closes with visualization of IIT Jodhpur 2025.

Effective execution of the strategy, so as to ensure actualization of the Vision, is a key priority. Detailed Action Plans will be prepared for this purpose, along with efficient monitoring, evaluation and accountability systems, once the approach proposed in this document is approved in principle, with suitable modifications as per the Board's guidance. Baseline data, benchmarking and clear measurement criteria will be laid down for this purpose. A clear strategy for Management of Change, and use of Organizational Development exercises, would be important features of the implementation strategy.

## **In Closing...**

This *Sixth Convocation* of IIT Jodhpur is a special occasion for the Institute, and a defining moment of the lives of 232 Students, who will be facing the real world from this afternoon. On behalf of the Institute and on my personal behalf, I heartily *congratulate* the *Parents* of the *Students* receiving the degrees today. With this, the total number of students who graduated from this Institute stands at 1,564.

It's also a momentous occasion for all of us here to have the privilege of having Prof. Geoffrey Hinton as the Chief Guest for this convocation. Thirty years ago, Hinton's belief in neural networks was contrarian. Now it's hard to find anyone who disagrees with him. Hinton had actually been working with deep learning, then known as simply Neural Networks, since the 1980s, but its effectiveness had been limited by a lack of data and computational power. His steadfast belief in the technique ultimately paid massive dividends in 2012 during a rather obscure research challenge, the third year of the annual ImageNet competition, which challenged teams to build computer vision systems that would recognize 1,000 different kinds of objects, from animals to landscapes to people. Till then the best AI teams could obtain an accuracy of around 75%. That year, Prof. Geoffrey Hinton and two of his students won the challenge by a staggering 10.8 percentage points. Soon enough, deep learning was being applied to tasks beyond image recognition, and also for a broad range of industrial applications.

Today, there is hardly any area that is not touched by Deep Neural Networks. Prof. Hinton was awarded the Turing Award, alongside other AI pioneers Yann LeCun and Yoshua Bengio, in 2019.

Prof. Geoffrey Everest Hinton is an English Canadian Cognitive psychologist and Computer Scientist. Since 2013 he divides his time working for Google on Google Brain and the University of Toronto.

We shall have the privilege of our School of AI and DS being inaugurated by a luminary like Prof. Hinton on, the 6<sup>th</sup> of December, which also happens to be his birthday. Wish you a very Happy Birthday Prof. Hinton from all of us here.

I hope through my address, I wanted to tell all of you that IITJ is on its path of progress. With all your good wishes we shall continue to strive for the best.

Ladies and Gentlemen, thank you for your time and attention.

*Jai Hind !!*

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**Dr. R. Chidambaram**

*Chairman, Board of Governors, IIT Jodhpur*

Honourable Chief Guest Prof. Geoffrey Hinton, Professor Santanu Chaudhury, Director of IIT Jodhpur, distinguished members of the Board of Governors, members of the Senate, faculty and staff of IIT Jodhpur, invitees, guests, parents, and my dear young friends who are graduating today:

On behalf of the Board of Governors, it gives me immense pleasure to extend a very cordial and special welcome to our Chief Guest of this function Prof. Geoffrey Hinton.

The IIT system has, as we all know, a very high global brand equity; among the IITs, of course, IIT Jodhpur is a relatively young institution. It was established in 2008. Prof. Santanu Chaudhury has made commendable and successful efforts to attract new faculty members in various disciplines, including highly qualified academics as visiting faculty, and also to bring in bright scientists, many of them awaiting their Ph.D. degrees, as Young Associates.

Director Santanu Chaudhury mentioned about the progress of the Institute over the last year. I am very happy that Masters & Ph.D. programmes have been initiated jointly with the proximate AIIMS in Jodhpur in Medical Technology, and Tech-MBA programme on 'Management with Data Science'. There is emphasis on Design thinking and Creativity, also experiential learning, from the first year itself. The Institute has also taken the necessary steps to complete the curricula by conducting classes through the online mode, and in fact has also taken up some development projects in this context.

I am particularly happy that several inter-disciplinary Ph.D. programmes have been started in Artificial Intelligence, also Science of Intelligence, smart healthcare, and so on. The institute is establishing a company: “iHub Drishti Foundation”, to act as an R&D Hub in the field of Cyber Physical Systems. As you heard from the Director, a new School of Management and Entrepreneurship has also been created here – after all, Rajasthan is famous for its entrepreneurs. The Incubation & Innovation Centre and the Sports Complex were inaugurated by the Hon’ble Shiksha Mantri Dr. Ramesh Pokhriyal ‘Nishank’ on 16<sup>th</sup> October this year.

IIT Jodhpur has research programmes in various advanced areas and many of them are naturally inter-departmental, because the boundaries between scientific disciplines are continuously becoming more and more fuzzy.

A New Education Policy has been announced by the Government, with many new forward-looking features and flexibility. Young people must have the opportunity to maximize their talents and make career choices in tune with their talents, and the New Education Policy provides the framework for that. This aspect is built into the IIT Jodhpur curricula. A new Science, Technology & Innovation Policy is also on the anvil.

Technology Foresight is required to select the Critical Technologies needed for rapid development of the country, and for it to become a knowledge economy, and these must be re-assessed periodically, based on the latest scientific developments. In all this, we need to develop self-reliance, that is achieve what Prime Minister Modi ji calls *Atmanirbhar Bharat*; I am sure IIT Jodhpur will play a major role in achieving this goal. Of course, *Atmanirbharta* does not mean that we should not go in for international collaboration – the scientific world today is very strongly linked; we should go in for international collaboration, but only on an ‘*equal partner*’ basis, and this is happening now.

Jodhpur has been identified as one of the six cities for initiating city-based innovation clusters by the Office of the Principal Scientific Adviser to the government of India, with the objective of increasing cooperation amongst proximate national laboratories and universities, and

also of enhancing academia-industry interactions. IIT Jodhpur will be the coordinator for this cluster.

After the degrees you get today, you young people will start a new chapter in your careers, pursuing research, or acquiring additional academic qualifications, or in industries. Some of you may start your own enterprises. I wish you all the best in your future careers.

*Thank you and Jai Hind*

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## List of Medal Winners

## Medal Winners of 2020 Programs

### BACHELOR OF TECHNOLOGY

#### President's Gold Medal

for the graduating student with **Best Academic Performance** among students of **ALL B.Tech.** Programs of the class of 2020 goes to

**Chitraksh Sadayat**

#### Chairman, Board of Governors, Gold Medal

for the graduating student with **Best All-Round Performance** among students of **ALL B.Tech.** Programs of the class of 2020 goes to

**Sumanth U**

#### Director's Gold Medal

for the graduating student with **lady All-rounder** among students of **ALL B. Tech.** Programs of the class of 2020 goes to

**Satya Bhavsar**

#### Silver Medal

for the graduating student with **Best Academic Performance** in the graduating class of 2020 of the **B.Tech. (Computer Science and Engineering)** Program goes to

**Chitraksh Sadayat**

#### Silver Medal

for the graduating student with **Best Academic Performance** in the graduating class of 2020 of the **B.Tech. (Electrical Engineering)** Program goes to

**Sumanth U**

#### Silver Medal

for the graduating student with **Best Academic Performance** in the graduating class of 2020 of the **B.Tech. (Mechanical Engineering)** Program goes to

**Raj Dewangan**

## MASTER OF TECHNOLOGY

### Jagdish Chandra Bose Gold Medal

for the graduating student with **Best Academic Performance** among students of **ALL M.Tech.** Programs of the class of 2020 goes to

**Harsh Deswal**

## MASTER OF SCIENCE

### Certificate of Merit

for the graduating student with Best Academic Performance in the graduating class of 2020 of the **M.Sc. Chemistry**) Program goes to

**Praveen Kumar**

### Silver Medal

for the graduating student with Best Academic Performance in the graduating class of 2020 of the **M.Sc. (Mathematics)** Program goes to

**Pushpendra Singh**

**Sushmita Yadav**

### Silver Medal

for the graduating student with Best Academic Performance in the graduating class of 2020 of the **M.Sc. (Physics)** Program goes to

**Arun Jangir**

### Doctor of Philosophy

### C. V. Raman Gold Medal

for the graduating student with **Best Thesis Work** among students of **ALL Ph.D.** Programs of the class of 2020 goes to

**Rahul Kumar**

## List of Graduates

## Recipients of Degrees

### BACHELOR OF TECHNOLOGY

#### Computer Science & Engineering - Class of 2020

Bhamare Nikhil Daryavsing

Sushil Kumar

Ajat Prabha

Akshay Malav

Ashutosh Kumar Jatav

Ashutosh Yadav

Chetan Prakash Meena

Chitraksh Sadayat

Himanshu Dhankhar

Katta Rajasekhar

Kavish Gambhir

Kuldeep Singh Jangir

Lakshya Garg

Lovish Singla

Machabathuni Vijay Siddharth

Manvendra Singh Kushwah

Meet Ketanbhai Mehta

Nagalgaonkar Vinay Ramkishan

Naramala Mourya Mithra

Nikhil Srivastava

Nikunj Kumar Labana

Nirne Shivam Chandrakant

Parate Aniket Kishor

Paridhi Gehlot

Patel Shreya Hasmukh

Qazi Sajid Azam

Rahul Jindal

Sairipally Sai Surya

Saksham Gupta

Sanchit Taliyan

Sarvesh Kumar

Satya Bhavsar

Anurag Shah

Shashank Mohabia

Sohail Khan

Vishakh S

Zaid Khan

Chinmay Garg

Saksham Sanjay Banga

## BACHELOR OF TECHNOLOGY

### Electrical Engineering – Class of 2020

Abhinav Joshi	Manu Sheoran
Adeesh Jain	Mukesh Kumar Das
Adit Raj Gautam	Nomraj Meena
Akhil Goel	Patil Rushabh Hemant
Akhil Kumar Singh	Pravendra S Khinchi
Anchal Singh	Prayrika Sharma
Ashutosh Pandey	Rakshith Ramakanth Malapalli
Ayush Mukund Gupta	Shreshth Saini
Dharmesh Gupta	Shruti Sachan
Hemendra Kumar Singh	Shuchi Jain
Hitesh Kumar	Sourabh Kumar Meena
Jitendra Jain	Srijan Agarwal
Jitendra Meena	Srishti Chauhan
Kanak Jain	Sumanth U
Kapil	Ujjwala Anantheswaran
Karan Kumar	Yash Kumar Chouhan
Kasar Rajat Sanjay	Abhay Kumar
Kritika Chandan	Abhinav Rishikesh
Kshitij Kumar	Divij Gupta

## BACHELOR OF TECHNOLOGY

### Mechanical Engineering – Class of 2020

Abhishek Meena	Praduman Gupta
Vartha Divyesh Yashvant	Pranav Maheshwari
Aaditya Raj	Preshit Ameta
Abhishek Bhaskar	Raghavendra Meena
Anuj	Raj Dewangan
Badal Kumar	Raveen
Bhaskar Vijay	Sachin Beejawat
Deependra Singh Bhati	Sachin Bundela
Gautam Jain	Sakshi Jeengar
Gulab Chand Meena	Shambhu Singh
Harshul Sharma	Shiv Kumar Mudgal
Hemant Kumar	Shreenath Nathany
Jitendra Kumar Meena	Shubham Doharey
Joshi Parth Jayeshbhai	Subham Kant Das
Mukesh Sharma	Sudhir Kumar Kushwaha
Nale Raturaj Shivaji	Suresh
Nitesh Rai	Upendra Sengar
Parvesh	Vinod Kumar Saini
Poojan Gajjar	Vishal Jain
Pradeep Panchal	

## BACHELOR OF TECHNOLOGY

### Biologically Inspired System Science – Class of 2020

Ankur Kamboj

## MASTER OF SCIENCE

### Chemistry – Class of 2020

Pallavi Singh

Hemananda Hembram

Vinod Kumar

Arvind

Asit Kumar

Avinash Garg

Avleen Kaur Chawla

Bharat Singh Patel

Kanika

Maitreyee Sarkar

Parijat Pratim Das

Piyush Singh

Pooja

Praveen Kumar

Raushan Kumar

Simran Chaudhary

Vikram

## MASTER OF SCIENCE

### Mathematics – Class of 2020

Ajeet Kumar

Aman Swami

Anil Kumar

Aparna Bansal

Dev Prakash Jha

Manish

Nitish Kumar

Pushpendra Singh

Satpal

Satyajit Dhadumia

Shalini

Sushmita Yadav

Tapesh Yadav

Urvashi Verma

Vishwakarma Amit Tufani

Doem Vanny



## MASTER OF SCIENCE

### Physics – Class of 2020

Abhishek Roy	Naveen Chitra
Aman Srivastava	Prosanta Mandal
Anil Kumar	Rajaram
Arun Jangir	Ravikant Kumar
Badal Bhalla	Sachin Kumar
Deepak	Sundar Dhara
Hemendra Singh	Vishal Gupta
Inderjeet	Vishal Khandelwal
Mahima Yadav	Yogendra Singh Nehra

## MASTER OF TECHNOLOGY

### Computer Science & Engineering – Class of 2020

Gaurav Kumar  
Prity Goyal  
Ritesh Kumar Gupta  
Vipul Chauhan

## MASTER OF TECHNOLOGY

### Electrical Engineering – Class of 2020

Anil Upadhyay  
Kartikay Mani Tripathi  
Rajat Kumar Chaudhary  
Sandeep Kumar Yadav

## MASTER OF TECHNOLOGY

### Mechanical Engineering – Class of 2020

Akhil Pratap Singh

Ananta Jain

Aswani Sarraf

Dhalesh Kumar

Furkan

Harsh Deswal

Jagdish Kumar

Mahaveer Prasad

Nitin Sukhwal

Patel Shreyas Maheshkumar

Priyanshu Raj Shrivastava

Sagar Vashisht

Gaunekar Sairaj Eknath

Vipul Ashok Sanap

Vivek Saxena

Gaurav Sharma

## MASTER OF TECHNOLOGY

### Metallurgical and Materials Engineering – Class of 2020

Chirag Sharma

Juhi Srivastava

Mahesh Panchal

Nishant Dahare

Prince Jain

Dongarwar Rubal Sanjiv

Sandeep Das Gupta

Siddharth Yadav

Tanay Sahu

## DOCTOR OF PHILOSOPHY

### Class of 2020

Vikash Chandra Janu

Kumar Rahul

Deepak Kumar

Amit Bhati

Rakhi N K

Chandni Kumari

Nupur Rathore

Dileep Kumar

Shivanjali Saxena

Megha Singh

Satendra Pal Singh

Vikas Pratap Singh

Rakesh Kumar

Tushar Shankar Shinde

Shalini Singh

Hargeet Kaur

Phadatare Hanmant Pandurang

Pravesh Kumar

Javid Ahmad Naikoo

Shraddha Choudhary

Hiteshi Jain

Rajesh Kumar

Sachinkumar Rajendrakumar Vyas

Vijendra Singh Bhati

Abhinav Srivastava

Rahul Kumar

Priya Malpani

Adarsh Nigam

Vandana

Neeraj Goel

Lochan Sharma

## Oath

I pledge that I shall be scrupulously honest, with every thought, word and deed, and in the discharge of my duties. I shall honour always the knowledge, wisdom and values inculcated in me by this Institute.

I pledge to devote my knowledge and skills only towards the wellbeing of the citizens of the country and of humanity at large. I shall uphold always the dignity and integrity of my profession, Institute and Nation.

# 6<sup>th</sup> Convocation Committee

Chairman Professor S. R. Vadera  
Co-chairman Dr. S. C. Bose

## MEMBERS

### 1. Academics

#### Subcommittee Co- Chairpersons: AD-UG and AD-PG

- |     |   |   |
|-----|---|---|
| 1.1 | <i>Degree Certificates Verification, Printing and signature</i>   | <i>Assistant Registrar (Academics)</i>              |
| 1.2 | <i>Script of Proceedings and Scroll of Honour of Convocation</i>  |   |
| 1.3 | <i>Capes (Students &amp; Academic Procession Members) &amp; Mask Procurement (Academic Procession Members, Attendees and Staff)</i> |   |
| 1.4 | <i>Online Registration and Distribution of Material</i>   |   |
| 1.5 | <i>Academic Procession, Guiding the Procession</i>  | <i>Faculty In-Charge, Grades &amp; Registration</i> |

### 2. Convocation Material

#### Subcommittee Chairperson: Chairman Publication Committee, Co-Chair: Deputy Librarian

- |     |  |   |
|-----|--|---|
| 2.1 | <i>Single Booklet with Director's Report, Scroll of Honour, Chief Guest Address, Chairman, BoG Address</i> | <i>Publication Committee, and Office of Library</i> |
| 2.2 | <i>Printing of Proceedings &amp; Booklet</i>   |   |

### 3. Coordination with the Chief Guest and Chairman, BoG

**AD (Academics-PG) & AD (Academics-UG)**

### 4. Graduands

#### Subcommittee Chairpersons: AD (Students) and Chairman-Students Scholarship & Prizes Committee

- |     |  |  |
|-----|--|--|
| 4.1 | <i>Medals &amp; Prizes (with Certificates)</i> | <i>Chairperson<br/>(Student Scholarships and Prizes Committee)</i> |
| 4.2 | <i>Online No dues</i>                          | <i>Superintendent (Students)</i>                                   |

### 5. Hosting of Chairman, BoG

#### Subcommittee Chairperson: Dean (R&D)

## 6. e-Invitations

### Subcommittee Chairpersons: AD (IRO) & AD (Students)

5.1	Faculty Members and Staff Members	Office of Director
5.2	Members of BoG and Senate	Public Relations Officer
5.3	Members of FC and BWC	Assistant Registrar (Students)
5.4	Adjunct Faculty, Advisors	
5.5	Parents of Graduands, and Students	
5.6	Dignitaries from Jodhpur	
5.7	Dignitaries from outside Jodhpur	

## 7. Infrastructure & Venue Preparation

### Subcommittee Chairpersons: Chairperson CCCD & Associate Dean (Infrastructure)

7.1	Decoration, Stage, Chairs, Posters	Dr. Ram Prakash
7.2	Printing of Banners and Standees	Dr. Kshema Prakash
7.3	Backup Power	Dr. Sumit Kalra
7.4	Fire Fighting	Dr. Shrutidhara Sarma
7.5	Audio-visual, Photography & Videography, Event & Group Photos	Dr. Preeti Tiwari Dr. Akanksha Choudhary Assistant Executive Engineer (Civil) Assistant Executive Engineer (Electrical) Assistant Engineer (Electrical) Logistics Officer

## 8. Logistics and Security

### Subcommittee Chairperson: Registrar/Adviser Admin & Co-chairman: Assistant Executive Engineer (Civil)

8.1	Parking and Signages	Security Officer
	Spaces at LHB & Institute Building	Assistant Executive Engineer (Electrical)
8.2	Security Management	Logistics Officer
8.3	Housekeeping of the Venue	Assistant Engineer (Electrical)
8.4	Arrangement of Fire Brigade	

## 9. Press and Publicity

- |     |                              |                          |
|-----|------------------------------|--------------------------|
| 9.1 | Invitations                  | Public Relations Officer |
| 9.2 | Bags and Materials           |                          |
| 9.3 | Press Release                |                          |
| 9.4 | Director's briefing to Press |                          |

## 10. Social Media Publicity & Convocation Website

### Subcommittee Chairs: Chairman, Institute Publicity & Media Presence Committee & Head Computer Centre

- |      |   |  |
|------|---|--|
| 10.1 | Publicity on Social Media<br>(Facebook, LinkedIn, Twitter, Instagram, etc.) | Dr. Kaamyia H. Sharma, Dr. Debanjan Guha Roy,<br>Dr. Parichay Patra, Dr. Abir Bhattacharya |
| 10.2 | Regular Updating Website  | Webmaster and Sh. Ram Singh Ratnu  |

## 11. Medical Safety & Emergency Services

### Subcommittee Chairperson: Chairperson Medical Services Committee

- |      |                              |                                 |
|------|------------------------------|---------------------------------|
| 11.1 | Medical & Ambulance Services | Medical Officer                 |
| 12.2 | Safety of the venue          | Assistant Engineer (Electrical) |

## 12. Virtual Event Planning & Execution

### Subcommittee Chairpersons: Dr. Rajlaxmi Chouhan and Head, Computer Centre

- |      |   |   |
|------|---|---|
| 12.1 | Virtual Event Planning                            | Dr. Ashish Mathur   |
| 12.2 | Invocation, National Anthem & Recording           | Dr. Arpit Khandelwal  |
| 12.3 | Platform for virtual hosting of event             | Dr. Sumit Kalra   |
| 12.4 | Planning of Seating Arrangement on Dias           | Dr. Amit Bhardwaj   |
| 12.5 | Rehearsal   | Dr. Rajendra Nagar  |
| 12.6 | Design of e-invitation card, banners and standees | Dr. Ravi Bhandari   |
| 12.7 | Internet Connectivity                             | Sh. Gaurav Bhansali<br>Sh. Vinay Yadav<br>Sh. Mohit Mathur<br>Office of Computer Centre |

- |     |                                       |  |
|-----|---------------------------------------|--|
| 13. | Procurement Bill Processing Committee | Sh. Amardeep Sharma, Deputy Registrar (S&P)<br>Sh. Naresh Joshi, Deputy Registrar (Accounts) |
|-----|---------------------------------------|--|

14.

Day to Day Review

Chairman, Co-chairman, Chairperson CCCD,  
Associate Dean (Academics-PG), Associate  
Dean (Academics-UG), Dr. Rajlaxmi Chauhan,  
Head Computer Centre

15.

Convener

Sh. Amardeep Sharma, Deputy Registrar

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