

Annual Report 2021-22

(Sep 01, 2021, to Aug 31, 2022)

IIC-IIT Hyderabad



**INSTITUTION'S
INNOVATION
COUNCIL**
(Ministry of Education Initiative)



భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad





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A. About IIC Institute

● Vision / Mission of IIC established at the Institute

- Identification of the best of ideas and providing them a 'womb' to incubate eventually to transform into a Startup or entrepreneur endeavor.
- Soliciting an entrepreneur through the application of knowledge and expertise, academic as well as industrial.
- Empowering an idea with all important ingredients and resources aiding its conversion into a successful product or service.
- Helping entrepreneurs to grow holistically with business acumen.
- Bring socio-economic change in the country by finding innovative solutions to daily met problems.
- Meet once a quarter to formalize the discussion and keep action points for activities in the coming quarter and regularly update it.

● Journey of IIC established at the Institute

Institute Innovation Council at IIT Hyderabad was initially established in February 2018 with Innovation, IPR, and Entrepreneurship as its 3 pillars. Later in February 2021, the council was reconstituted with 22 Representatives, per the IIC norms, with an appropriate framework designed for its Objectives, Functions, Roles, and Responsibilities. Since then, all the innovation and entrepreneurship-related activities of IIC have been strictly implemented by the Council. The IIC meetings were conducted timely with all the representatives of the Council. IIC at IIT Hyderabad has 32 active members to inculcate the culture of Innovation & Entrepreneurship on campus.

Institute Innovation Council at IIT Hyderabad has a robust Innovation and Entrepreneurship culture with 16 IIC Calendar Activities, 9 Celebrations, 5 MIC-driven Activities, and 31 Self-driven Activities. IIC at IITH could achieve a rating of 2 stars last year, and hopefully, it will reach 4-star ratings this year. Innovation and Entrepreneurship Quotient at IITH is 7th Rank in ARIIA-2021, 200+ Patents, 100+ Startups, 1,000+ PhD Graduated and 1700+ R & D Projects.

● Diversified representation in the IIC established at the institute from industry, Interdisciplinary & Departments/ Units, etc.

- **Startup / Alumni Entrepreneur:** Mr M Sai Kiran, CEO, Founder (SK IOT)
- **The expert from nearby Industry / Industry association/ Ecosystem Enabler:** Mr Vinay Chilakapati (CEO, Innomet Advanced Materials Pvt. Ltd.)
- **FI/ Bank Investor/ Angel Investor/ VC:** Mr Reehan Shaik, Bank Manager, Canara Bank, IITH Branch, Ex-officio
- **Incubation Centre:** Dr Siva Rama Krishna Vanjari, Faculty-in-Charge, FabCI
- **Patent Expert:** Mr Anna Eswara Reddy, Patent Analyst

B. Brief mention of key functionaries at the IIC Institute

● President

Prof B. S. Murty, Director, IITH

● Vice President

Prof Kiran Kuchi, Dean (R&D), IITH

● Convenor

Dr Nakul Parameswar, Assistant Professor, Department of EM

● Coordinators etc.

- Innovation Activity Coordinator: Dr Sumohana Channappayya, Former Dean (R&D), IITH
- Startup Activity Coordinator: Prof S. Surya Kumar, Faculty-in-Charge, Incubation Centre, IITH
- Internship Coordinator: Dr Abhinav Kumar, Faculty-in-Charge, Office of Career Services
- IPR coordinator: Dr Pradeep Kumar Yemula, Faculty-in-Charge, IP Cell



- ARIIA coordinator: Dr Priyotosh Bandyopadhyay, ARIIA Coordinator
- NIRF coordinator: Dr Sai Santosh Kumar Raavi, NIRF Coordinator
- Innovation Ambassador: Prof Deepak John Mathew, Head, Dept. of Design
- Innovation Ambassador: Dr Mudrika Khandelwal, Associate Professor, Dept. of MSME
- Entrepreneurship Coordinator: Dr M. P. Ganesh, Head, Entrepreneurship & Management Dept.
- Innovation Ambassador: Dr Meduri Praveen
- Innovation Ambassador: Dr Sayak Banerjee
- Innovation Ambassador: Dr Suhanya Duraiswamy
- General Member: Prof Ramesh G, Chair - Rural Development Centre
- General Member: Dr Prasad Onkar, FIC – Unnat Bharat Abhiyan (UBA)
- General Member: Dr Avinash Eranki, FIC - Students Affairs
- Social Media Coordinator/ Secretary: Ms Mitalee Agrawal, Public Relations Officer, IITH
- General Member: Prof Mohan Sangeneni, Advisor-Innovation & Translational Research
- Startup / Alumni Entrepreneur: Mr M Sai Kiran, CEO, Founder (SK IOT)
- Expert from nearby Industry: Mr Vinay Chilakapati (CEO, Innomet Advanced Materials Pvt. Ltd.)
- FI/ Bank Investor/ Angel Investor/ VC: Mr Reehan Shaik, Bank Manager, Canara Bank, IITH Branch, Ex-officio
- Incubation Centre: Dr Siva Rama Krishna Vanjari, Faculty-in-Charge, FabCI
- Patent Expert: Mr Anna Eswara Reddy, Patent Analyst
- Startup Activity Coordinator: Mr Sarthak Konher, Head, E Cell
- Innovation Activity Coordinator: Mr Brijesh, Science & Technology Secretary, Student Gymkhana
- Internship Coordinator: Mr Krutik Mehta,
- IPR Coordinator: Mr Gaddam Akhileswar Chowdary
- Social Media Coordinator: Ms Tisha Pantawane, Media Secretary, Student Gymkhana
- General Member: Mr Priyabrata Rautray, PhD Scholar, Dept. of Design
- General Member: Mr Vaibhav Kumar, BTech 4th Year, IITH

C. Portfolio/graphical/Tabular representation of Resource strength (human capital and Physical capital) of the IIC institution

- Total No. of IIC Members: 32
- Total No. of IAs: 5
- Total No. of faculty Mentors from Portal: 18
- Pre-Incubation Units: 10
- Incubation Units: 4
- IP Facilitation Unit: 1

D. Highlight Facilities, Infrastructure of Pre-Incubation & Incubation kind, and Student bodies/clubs engaged in the promotion of Innovation and Entrepreneurship on the campus.

Incubators:

i-TIC foundation:

i-TIC Foundation is the Technology Business Incubator (TBI) at IIT Hyderabad. The focus is on creating a supportive and nourishing environment for entrepreneurs. The thrust areas at the Incubator are Artificial Intelligence, Aerospace, Telecommunication, Digital Manufacturing, Chip Design, Sensors, IT, Bio-Medical, Automotive, Advanced Materials, Energy, Flexible Electronics, and Other Emerging Technologies. A few companies that are incubated, related to ICT are SKIoT (IoT), Acausal (Robotics), SenseHealth (Bio-Medical), Osure (Healthcare), and Skelregen (Bio Material). i-TIC provides the necessary facilities to these startup companies, along with guidance

and mentoring by the faculty members of IITH and experts from the industry, to develop a robust ecosystem for entrepreneurship.

Center for Healthcare Entrepreneurship:

The Foundation for the Center for Healthcare Entrepreneurship is sponsored by two IIT Bombay alumni and is focused on making universal healthcare a reality. The CfHE program is dedicated to achieving universal healthcare by igniting the spark of entrepreneurship in our youth and providing them with focused training and top-notch mentorship. The Center's objective is to catalyze healthcare innovation to bring about affordable solutions to address the healthcare needs of India. The Center hopes to foster entrepreneurs to deliver a pipeline of cost-efficient, increasingly 'commercialized'. NemoCare, BeAble, KvayatMedical, Heamac healthcare, Aerobiosys, VaccineOnWheels.com, and chemioptic Healthcare have incubated to start up their dream idea. They become incubated companies at CfHE and continue to attract support both in terms of mentorship, access to funding opportunities, and physical space in our state-of-the-art IIT Hyderabad location dedicated to the CfHE Incubator.

Fabless Chip Design Incubator:

The Fabless Chip Design Incubator (FabCI) is a flagship program being executed with the support of the Ministry of Electronics and Information Technology (MEITY) and focuses on creating an ecosystem wherein these primary activities get executed for any startup in the area of chip design. The primary motivation for this unique incubator program is to provide a one-stop solution for start-ups focusing on the area of chip design. We want to help incubate multiple "Make-in- India' chip design companies. We aspire to build an ecosystem wherein the incubates are not only provided with the relevant infrastructure hardware and software but also are handheld through the path of success with the help of mentors who are pioneers in this field The grand vision is to leverage the design expertise that exists in India to create Indian IP and to make a mark in chip design internationally.

Technology Research Park:

"IITH Technology Research Park" is an independent Section 8 Company, founded, promoted, and hosted by IIT Hyderabad, governed by a Board of distinguished academicians, faculty of IIT Hyderabad, and industry professionals, to inoculate the idea of innovative Entrepreneurship in collaboration with Research Development. IIT Hyd Research Park is a self-reliant team endorsed by IIT Hyd and its alumni. The IIT Hyd Research Park promotes the betterment of research and development by the institute through friendship with industry, helping in the advancement of modern ventures, and build-up economic development. The IIT Hyd Research Park assists organizations with a research target to set up an infrastructure in the park and advantage of the expertise available at IIT Hyd.

Student Clubs:

Scitech Council:

A Science Technology club to provide a platform for technocrats to explore their ideas and bring in new innovations Clubs under Scitech Council.

Entrepreneurship Cell:

The Workshop Series hosted by E-Cell IITH provides an environment for students from various colleges to network, and learn together about the latest developments in different fields of technology.

Megathon is one of the biggest student entrepreneurship hackathons in Hyderabad co-hosted by E-Cell IITH and IITH which aims to provide a common platform for student entrepreneurs to network, work on innovative solutions and build startups.

E-Summit is one of the biggest entrepreneurship conclaves in India and a flagship event of E-Cell, IIT Hyderabad which aims to bring early entrepreneurs, students, corporates, venture



capitalists, and startups with budding ideas from all over the country to one platform sharing their entrepreneurial endeavors and experiences. It hosts thought-provoking talks, Panel Discussions, competitions, and many more. **E-Cell, IIT Hyderabad has organized 'E-Summit 2022 - An Exordium of Resurgence' on 21st - 23rd January 2022** covered more than 1,00,000 people through its extensive outreach program, over 100+ startups were expected to be part of this event.

E. Highlight Achievements (Narrative/Graphical/tabular representation)

- Number and Different types of I&E and IPR activities Conducted: 61
- No. of student's & faculty ideas generated: 47
- No. of student's & faculty Innovation/prototypes developed: 26
- No. of IPs generated, published, and granted: 87
- No. of Student & Faculty Start-ups/Ventures established: 82
- Amount spent on promotion and awareness generation on Innovation Entrepreneurship in the campus: Rs. 32,87,022/-
- Amount grant or fund supported to student & Faculty lead Innovations, start-ups, and IPR: Rs. 1,66,95,000/-
(It may be noted that while overall Innovation & Entrepreneurship ecosystem is synchronized through IIC of the Institute, from an accounting and book-keeping perspective, the Startup grants are supported through DST approved society registered as I-TIC Foundation IIT Hyderabad.)
- No. of Technology Transfer and Commercialisation happened: 3

F. Highlight few best IIC Faculty/Student members and their achievements/ Rewarded for the innovations at different forum

'Packaging from palm and banana leaves' by Rucmenya Basariya and Mudita Dubey (M Des 2021-23) bagged second place at the R2S, Project Read to Shine Hiroshima-Telangana. The team had to generate a creative solution for sustainable packaging of vegetables, meat or beverages. Based on research and brainstorming on Indian traditional packaging styles and bio-inspired designs, they zeroed on using a material derived from banana and palm leaf for packing vegetables.



Figure: Packaging from palm and banana leaves

Akanksha Singh (M Des 2020-22) is the First runner-up at the ADI Battle Of Projects 2022, in the Furniture Design category. Spindle is an interactive bench that lets one fidget, play, and relax through its tactile experience. It has hundreds of wooden beads that rotate to give you an acupuncture massage while you're resting on it. The concept behind this project was to develop a mechanism that initiates a subconscious interaction with the user, making it fun for anyone who comes across it. Channeling people's fidgeting energies, spindle allows them to unwind and focus. Guided by Dr Neelakantan, Professor at the Department of design.



Figure: Spindle Furniture

G. Highlight selected best Innovations & images with mention of inventor/innovation name

6G extreme Massive MIMO technology

Indian Institute of Technology Hyderabad (IITH) researchers by Prof Sai Dhiraj and Prof Kiran Kuchi, Dean (R&D) announced a demonstration of the Extreme Massive MIMO (Multiple-Input Multiple-Output), a key technology that is being considered for 5G-advanced and 6G deployments. “Using multiple antennas at the base station, massive MIMO increases the coverage and capacity of cellular networks. This technology has become mainstream and is now an integral part of 5G. Extreme massive MIMO refers to next-generation technology that uses very large antenna arrays.

IITH developed an experimental research prototype with the aim to discover achievable performance limits. The first set of pilots conducted using 192 antennas and 48 radio frequency chains showed that up to 24-36 users could be served in the same spectrum. This is a 3-fold improvement over the state-of-the-art 5G massive MIMO technology, designed to support 12 simultaneous users. For cellular operators and users, this technology offers immense benefits; cell phone users will experience high-quality voice and video delivery in crowded areas like airports, malls, railway stations, etc.; cellular operators will be able to offer broadband wireless internet in rural households, dynamic steering of the cell site beams to reduce coverage holes in urban as well as rural areas”.

Highlights:

- IITH takes an early lead in 6G research by showcasing key developments in the use of extreme massive MIMO technology
- This is a 3-fold improvement over the state-of-the-art 5G massive MIMO technology
- Spectrum is a scarce natural resource. The extreme massive MIMO technology developed by IITH showcased possibilities of a 3-fold increase in 5G spectrum utilization
- MEITY and DOT have supported the R&D over the last 10-years



H. Highlight selected start-ups established by students/faculties with mention of founder/cofounder name

“World 1st affordable and long-lasting hygiene product DuroKea Series”, developed by IIT Hyderabad researchers

- This next generation DuroKea antimicrobial technology starts at Rs. 189, kills 99.99% of germs instantly and leaves behind the long-lasting protective nanoscale coating up to 35 days or till next wash.
- Researcher from Indian Institute of Technology Hyderabad led Dr Jyotsnendu Giri, Associate Professor in Biomedical Engineering and founder EaffoCare Innovation Pvt. Ltd incubating at iTIC, IIT Hyderabad has developed innovative DuroKea long-lasting technologies to combat COVID-19 virus spreading.
- The novel product was e-launched during an online event by Honorable Minister of Education Shri Ramesh Pokhriyal ‘Nishank’, in the kind presence of Shri B V R Mohan Reddy (Chairman, Board of Governors, IIT Hyderabad), Prof M Srinivas, Founder Dean ESIC Medical College and Hospital, Hyderabad, Prof B S Murty (Director IIT Hyderabad) and other officials from Ministry and IIT Hyderabad.
- The event can be view live at <https://youtu.be/WIDwW8r4kl4>.



I. List if any breakthrough Innovations / Technology Developed at the institute (2-3 technology with 2-3 lines about technology and innovation

Decellularized Cornea Matrix (DCM) Hydrogel

IIT Hyderabad's Researcher Dr Falguni Pati, Associate Professor, Department of Bio-medical Engineering along with his team has developed a hydrogel from discarded corneas from human and bovine sources using a novel and simple method. Serendipitously, they discovered the most striking feature of this tissue-specific hydrogel to prevent the cells from scar tissue formation, which is attributed to the microenvironment that cannot be offered by any synthetic or other natural material.

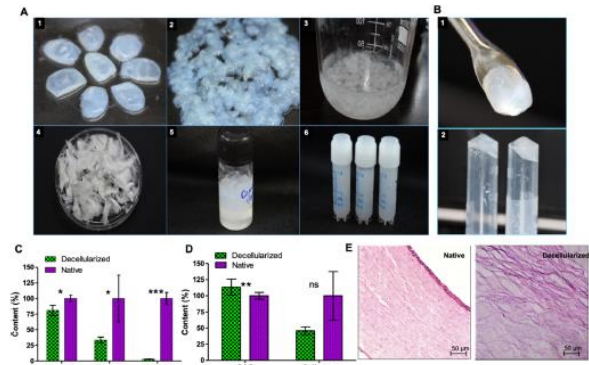


Figure 1. Preparation, decellularization, and biochemical characterization of dCMH: (A1) bovine cornea, (A2) minced cornea, (A3) decellularization process, (A4) after lyophilization, (A5) DCM solution preparation, (A6) prepared DCM solution. (B) Gelation after pH adjustment and incubation at 37 °C for 45 min. (B1) Physical properties of dCMH after cross-linking that attained scoopability. (B2) Image depicting the nonflowing behavior of dCMH after cross-linking. (C) Retained ECM components and DNA after tissue normalization. (D) Retained sGAG and collagen before weight normalization of native and decellularized corneal tissues. (E) H&E staining of native and decellularized corneal tissues.

Figure: Schematic - Preparation, decellularization and biochemical characterization of DCMH

Capable of being injected owing to its two phases (liquid and gel) based on the incubation temperature, we explored its potential to serve as a material for minimally invasive treatment to replace complicated surgeries. Until now, no strategy is available to prevent corneal scarring following an injury. They demonstrated, for the first time, that this hydrogel can be applied immediately after injury which helps to regenerate the cornea without scarring. Furthermore, no treatment is available other than partial donor corneal graft or corneal transplantation for scarring, which is already present in the visual acuity.

AI triggered Job Platform for Persons with Disabilities

The Principal Scientific Adviser to the Govt of India, Prof. K. Vijay Raghavan, soft-launched (betaversion) India'sfirst AI-triggered accessible job portal for persons with disabilities(PwDs). For this high impact and important project, different organizations with different competencies have come together. While IIT Hyderabad (IITH) gives its expertise for the AI component; Visual Quest India is the developer and Youth4Jobs brings its rich experience in skilling, disability, and job linkages. The project is funded by Kotak Mahindra Bank.



Figure: Mobile interface of the Beta version of the Swarajability

Highlights:

1. This is a unique platform to provide independence to persons with disabilities, through tech training and jobs, said the speakers.
2. The Platform is uniquely crafted using AI, for the benefit to the persons seeking employment having disabilities like visual impairment, hearing impairment, and locomotive disorders.
3. The platform will analyze the available information and suggest the required training needed for the concerned jobseeker.
4. It has been developed for both web and mobile versions for the maximum reach of the initiative.

There are 21 million persons with disabilities in India. About 70% of them are unemployed/underemployed. The Right to PwD Act 2016 for the first time highlights the right of a person with a disability (PwD) to education and employment. This provides an opportunity for PwDs to get skilled and linked to jobs. However, one major challenge they face is that most of the

existing platforms are inaccessible and not customized to the special needs of persons with disabilities. The importance of creating this platform is if the country is to meet its demographic dividend, the most vulnerable, like youth with disabilities, should be skilled and linked to sustainable opportunities. Technology can facilitate this and ensure that no one is left behind.

This customized job platform is named “Swarajability” as it gives independence to PwDs using technology, skills, and job linkages. It is an effort to include cutting-edge technology that allows persons with disabilities from all walks of life to join and explore job opportunities. Youth are given training that is tailored to their skills and knowledge. It is a one-stop-shop for organizations that want to hire persons with disabilities. Also, it supports NGOs, educational institutions, and governments in their efforts to promote diversity and inclusion. Speaking at the occasion were Ms. Meera Shenoy, Founder-CEO, Youth4Jobs; Mr. Jayesh Ranjan IAS, Secy. IT, Telangana govt, Mr. Prakash Apte, Chairman, Kotak Mahindra Bank, Prof. B. S. Murty, Director, IITH and Dr. Maunendra Desarkar, Associate Professor, Department of CSE & AI, IITH.

IIT Hyderabad’s Researchers answered How antioxidants improve the inhibitory nature of Triclosan on Acetylcholinesterase enzyme

Triclosan was first developed in the 1960s. Since then, its application as an antimicrobial compound has constantly increased globally. It is frequently added to various consumer products such as toothpaste, detergents, or toys to increase their shelf life. COVID-19 pandemic has prompted even increased use of such antimicrobial compounds. Due to heavy and indiscriminate use, Triclosan came under the spotlight when its presence was detected in human urine, blood, and even milk. These results prompted scientists to explore the negative effect of Triclosan on humans. Even after several studies, the mode of action of Triclosan at the cellular level is still unclear. Dr Anamika Bhargava’s (Associate Professor, Biotechnology) lab at IITH is focused on understanding factors that lead to disease states. So, the mysteries around Triclosan’s effect on higher animals, including humans, intrigued Dr Anamika’s lab. In the past, their research work has demonstrated that “zebrafish (vertebrate animal)” can be used as a human mimetic to explore the effects of Triclosan.

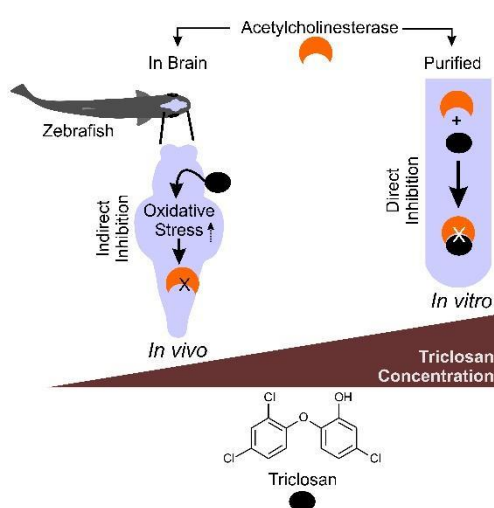


Figure: Graphical Abstract

In the current study, Triclosan inhibited purified acetylcholinesterase in a test tube, albeit at high concentrations. However, Triclosan at lower concentrations induced oxidative stress in the brain, which inhibited acetylcholinesterase. In a remarkable finding, the research reveals that acetylcholinesterase can be protected from the harmful effects of Triclosan by the use of antioxidants. When pretreated with melatonin (an antioxidant), the zebrafish did not show a severe decline in acetylcholinesterase activity upon triclosan exposure.

Innovative Hybrid FRP Strengthening Solution for Civil Infra like existing bridges and buildings

IIT Hyderabad Researchers developed an Innovative Hybrid FRP Strengthening Solution for Civil Infra like existing bridges and buildings. The proposed solution can increase the service life by ~20 years and the durability of the structures with marginal cost.

Highlights:

- FRP strengthening is more efficient than conventional techniques like concrete and steel jacketing.
- FRP strengthening gives high strength and stiffness to weight ratios compared to the other techniques.
- The strength and ductility of structural elements can be improved without increasing their weight.
- Conventional external bonding (EB) with FRP fabric in columns is adequate only under axial compression.
- The near-surface mounting (NSM) with FRP laminates improves only the flexural strength of RC members

The civil infrastructure industry is under constant pressure to upgrade the existing structures, which have deteriorated because of aging and corrosion issues. Recently survey shows that several bridges and several offshore structures are at the end of their life and require immediate structural strengthening. Also, another survey indicates that a significant number of Indian railway bridges need immediate strengthening. It is worth mentioning that most of the structures requiring strengthening are under service, which complicates the strengthening process. Also, the structures' present status and capacity are unpredictable, complicating the optimistic strengthening design. In the recent past, the civil engineering industry has gradually accepted FRP (fiber-reinforced polymer) composites to repair and rehabilitate concrete structures. FRP strengthening has numerous advantages over conventional strengthening methods such as concrete and steel jacketing due to its lesser weight to strength ratio, corrosive resistance, easy installation, and higher durability. However, there are no Indian standards (IS) available for FRP strengthening.



Figure: Mr Taraka during concept testing

The selection of the particular type of FRP material, its orientation, and place of application will be essential for effective utilization and improving efficiency under different loading scenarios. Prof S Suriya Prakash's CASTCON Lab at the IITH has developed the innovative hybrid FRP strengthening technique for improving strength and ductility under different loading combinations. Also, most of the previous research work has focused on circular and non-circular

columns of small size. However, the size of columns in the buildings and bridges are different with various shapes and slenderness ratios. Understanding the effect of hybrid FRP strengthening of columns in a real case scenario is essential. The present research focuses on understanding the size, shape, and slenderness effect on the hybrid FRP strengthening. The outcomes of this study lead to the development of Indian standards (IS) on guidelines for FRP strengthening.

Suzuki, Maruti Suzuki, and IIT Hyderabad jointly showcase India's 1st Research Demonstration of V2X (Vehicle-to-Everything) Communication

In an industry first effort, Suzuki Motor Corporation, Japan (SMC), Maruti Suzuki India Limited (MSIL), and IIT Hyderabad (IITH) have teamed up to research India-specific vehicle usage scenarios based on futuristic V2X (Vehicle-to-Everything) communication technology. V2X communications technology, when used in conjunction with appropriate infrastructure, traffic rules and driver education, can help reduce traffic incidents and road congestion. The first-of-its-kind 5 prototype vehicles showcasing these experimental applications in the Indian context were displayed at the IIT Hyderabad campus.



Figure: Demonstration of V2X

Some of the use case scenarios showcased were:

- Ambulance Alerting System: Car drivers are alerted about an approaching emergency vehicle and its path through V2X communication. It helps the driver to safely plan maneuvers and make way for an emergency vehicle. The alert system will also share minute details like the distance between the vehicles on a real-time basis.
- Wrong-way Driver Alerting system: Car drivers get a pre-alert about the existence of a wrong-way-driver approaching using V2X communication.
- Pedestrian Alerting System: This alert assists car drivers about a pedestrian nearby, using V2X communication, who could be coming in the way of the car. This will help the drivers to take precautionary measures to avoid a potential collision.
- Motorcycle Alerting System: Car drivers learn through V2X communication about a fast-moving 2-wheeler approaching from a blind spot and likely to collide. Real-time information is shared with the driver about the distance and direction of the approach.
- Road Condition Alerting System: The driver receives an alert of bad road conditions and cautions the driver to tread carefully ahead in the journey.
- Car as a computer: Enables all interested car users to share the idle computing capacity of the microprocessor in the car when it is not being used for driving

“World of PAVs” featuring the outcome of the first practice-based PhD

Department of Design, IIT Hyderabad (IITH), organized “World of PAVs” an exhibition of Personal Aerial Vehicles to be inaugurated by Prof B S Murty, Director, IITH. The exhibition is the outcome of practice-based research by Mr Priyabrata Rautray (joint PhD scholar - IITH and Swinburne University of Technology, Australia). The technologies involved in Personal Aerial Vehicles (PAVs) have been increasing rapidly over the last decade. We need to understand that PAVs are an entirely new transportation system. With the change in the medium, there will be unique user experiences and challenges that need to be addressed. Even though many institutions and organizations are involved in designing and developing PAVs, not much study has been conducted on human perception and their interaction with the device. Its relationship with the existing multi-modal transport systems and working scenarios is also understudied. Thus, this research



project aims to understand the users' form perception of PAVs, their needs, wants, and concerns, and how to convert them into design parameters for future development.

One of the original contributions to knowledge is to highlight how users' data can be converted into meaningful guidelines through practice-based research. The research will have tangible and intangible outputs that will empower designers to create new products. This research is supported by a larger collaborative project between engineering and the design department. The findings from this research project will feed into the larger project to develop the passenger cabin and the overall form of the PAV.

Highlights:

- The research aims to explore the forms in Personal Aerial Vehicles (PAVs) designs suitable for mobility in India's growing cities.
- This research project tries to understand the users' form perception of PAVs, their needs, wants, and concerns, and how to convert them into design parameters for future development.
- The study consists of two pan India online surveys to understand prospective users' perception of personal aerial vehicles.



Figure: Exhibition of PAV's

J. Participation of IIC-institute in various programs of Central and State Govt. Highlighting specially for the schemes or programs

- **ARIIA** – Ranked 7th in ARIIA Rankings
- **NISP Adoption status - Trained Faculty, Policy Formulation, Policy Implementation**
Policy formulated & circulated in the institute.
- **Smart India Hackathon: Yes**

K. Details of social media & Connections of IIC institute

S. No.	Social Media Site	No. of Followers
1	Twitter	36,000
2	Facebook	14,870
3	Instagram	3,860
4	Linkedin	32,201
5	Youtube	4,460

L. Testimonials from IIC members and external about IIC institute and IIC of MoE's Innovation Cell



IIC at IITH has redefined the approach towards motivating IITH fraternity towards innovation and engagement in entrepreneurship activity. This council brought subject experts together under an umbrella and will facilitate the seamless transformation of idea into implementation.

Prof B S Murty
Director, IITH
President, IIC-IITH



IIC has unified the various stakeholders such as our tech incubator, research park, patent cell, R&D section, and the academics under one roof with a single aim of synchronizing all activities related to innovation and research.

Prof Kiran Kuchi
Dean (R&D)
Convenor/Vice President



Invention and innovation (in addition to research and teaching) are now the pillars on which modern institutes of higher learning are built. Therefore, the IIC has a pivotal role to play in ensuring that invention and innovation at IITH are keeping pace with national and international trends.

Dr Sumohana S Channappayya
Associate Professor, Department of Electrical Engineering
Innovation Activity Coordinator, IIC-IITH



Setting the goals and synchronization of various sections of the institute towards that goal is a crucial step in fostering an active innovation ecosystem at an Institute. We look forward to IIC for playing that role.

Prof S Surya Kumar
FIC – Innovation, Incubation & Start-up
Startup Activity Coordinator, IIC-IITH



IIC@IITH provides a platform to nurture an entrepreneurial mindset amongst the members of IITH Fraternity and society at large. The various activities undertaken focuses on covering all the facets of Innovation & Entrepreneurship thereby providing a platform for thought, dialogue and action in the pursuit of creating an enabling ecosystem.

Dr Nakul Parameswar,
Convenor,
Assistant Professor, Department of Entrepreneurship & Management



IIT Hyderabad, has led innovation and entrepreneurship in engineering and technology. IIC is a great step in this direction, bringing multiple stakeholders together to facilitate the process further.

Dr Abhinav Kumar
Faculty-in-Charge, Office of Career Services
Internship Coordinator, IIC-IITH



IIC @ IITH, is the perfect platform to facilitate the vision of IITH of inventing and innovating technologies for humanity.

Dr Pradeep Kumar Yemula
Faculty-in-Charge, IP Cell
IPR Coordinator, IIC-IITH



IIC, promote incubation, innovation and entrepreneur activity. It also creates awareness among the faculty members towards the inter-disciplinary research activity related to innovation, the importance of patenting technology and the developing different TRL level technologies.

Dr Priyotosh Bandyopadhyay
Department of Physics
ARIIA coordinator, IIC-IITH



IITH, has improved this overall ranking in both QS and NIRF in 2022 largely due to excellent graduate outcomes as well as to the research advances made by the faculty. IIC plays a crucial role in sensitizing the IITH fraternity to innovate and take the lab-scale research to higher technology readiness levels, as is evident by a strong 75% jump in terms of patents filed by faculty during the year 2021 compared to 2020. Also, the BUILD project initiative that enables the students to work on innovative ideas creates a vibrant entrepreneurial and start-up culture in IITH.

Dr Sai Santosh Kumar Raavi,
Department of Physics
NIRF Coordinator, IIC-IITH



Innovativeness as a mindset is essential for each one of us in situations ranging from day-to-day problem-solving to long-term goal achievement. IIC, as an entity, tries to inculcate such a mindset among the IITH community.

Dr M P Ganesh,
Head - Department of Department of Entrepreneurship & Management
Entrepreneurship Coordinator, IIC-IITH



Creative human spirit to overcome contextual challenges is an essential nature of design and innovation. IIC gives an opportunity to systematically explore and agglomerate such endeavours for the betterment of the society.

Dr Prasad S Onkar,
Associate Professor, Department of Design, Coordinator UBA
General Member, IIC-IITH



The institution Innovation Council is a great initiative by the Ministry of Education to help individual institutions to create and lead innovation that can lead to translatable outcomes and help India toward self-reliance.

Dr Avinash Eranki
**Assistant Professor, Department of Biomedical Engineering, Faculty-in-
Charge - Students Affairs**
General Member, IIC-IITH



Key to innovation is an open mind and willingness to experiment and explore. The one who doesn't fear failure will taste the nectar of success.

Prof Deepak John Mathew,
Head, Department of Design
Innovation Ambassador, IIC-IITH



A comprehensive and well-rounded outlook is important for sustainable and useful innovation that IIC provides.

Dr Mudrika Khandelwal
Department of MSME
Innovation Ambassador, IIC-IITH



The key to the advent of technology and the modern insurmountable challenges is innovation.

Dr Meduri Praveen
Department of Chemical Engineering
Innovation Ambassador, IIC-IITH



IIC@IITH, will act as a springboard for breakthrough made-in-India technology development and commercialization in Hyderabad in the coming years.

Dr Sayak Banerjee
Department of Mechanical and Aerospace Engineering
Innovation Ambassador, IIC-IITH



Knowledge and creativity give birth to a fledgling called an idea which needs determination and drives to take flight into an innovative venture.

Dr Suhanya Duraiswamy
Department of Chemical Engineering
Innovation Ambassador, IIC-IITH



IITH well known as a pioneer institute for world-class innovations that promote entrepreneurship equally. IIC at IITH has given an amazing boost to innovation and entrepreneurship programs.

Ms Mitalee Agrawal
Public Relations Officer

Social Media Coordinator & Secretary, IIC-IITH



IIC provides a platform that enables various stakeholders from academia, industry, budding entrepreneurs, students, etc., to steer the innovations that can make India a global technology leader.

Mr M. Sai Kiran,
CEO, Founderr (SK IOT)
Startup / Alumni Entrepreneur, IIC-IITH



As IIC @ IITH gains momentum, we wish all the stakeholders to engage in a spirit of national development through Innovation.

Mr Vinay Choudary
(CEO), Innomet Powders
Expert from nearby Industry, IIC-IITH



IIC is the right step at the right time to provide the impetus required for researchers putting sincere effort in the pursuit of Atmanirbhar Bharat. Collective success is the mantra

Dr Siva Rama Krishna Vanjari
Faculty-in-Charge, FabCI
Incubation Centre, IIC-IITH



IIC has been successful in boosting the spirit of entrepreneurship among the students by regularly providing the motivation and guidance to aspiring entrepreneurs right from the ideation stage till pre-seed funding/ incubation. The synergy among representatives from the student community, faculty, industry leaders, and incubation centres in the council is impactful in inculcating a Startup culture in the institute.

Mr Sarthak Konher
E Cell Head
Startup Activity Coordinator (Students), IIC-IITH



As once said, "Innovation is where imagination meets ambition", I hope we can get the best out of all the creative minds in the institute through various activities of IIC.

Mr Rahul S
Science & Technology Secretary, Student Gymkhana
Innovation Activity Coordinator (Students), IIC-IITH



IIC is a great initiative to foster the culture of innovation and entrepreneurship in the institute.

Mr Krutik Mehta
BTech 4th Year
Internship Coordinator (Students), IIC-IITH



Institute Innovation Council (IIC) at IIT Hyderabad aims to boost the innovation activity on the campus by facilitating necessary resources. It also helps in developing a vibrant environment for research, innovation, and entrepreneurship activity at the IIT.

Mr Gaddam Akhileswar Chowdary
MTech 3rd year
IPR Coordinator (Students), IIC-IITH



Innovation is fuelled by building an environment where ideas can grow and connect.

Ms Tisha Pantawane
Media Secretary, Student Gymkhana
Social Media Coordinator (Students), IIC-IITH



Institute Innovation Council, is a great initiative that allows and nurtures innovations that can have an impact on society. IIT Hyderabad, with its many innovative and student-friendly initiatives such as the "BUILD project", not only encourages students but also funds them to develop technology for tomorrow. I had a great first-hand experience of these activities and wish all the very best to IIC and IITH.

Ar. Priyabrata Rautray
PhD Scholar, Department of Design
General Member (Students), IIC-IITH

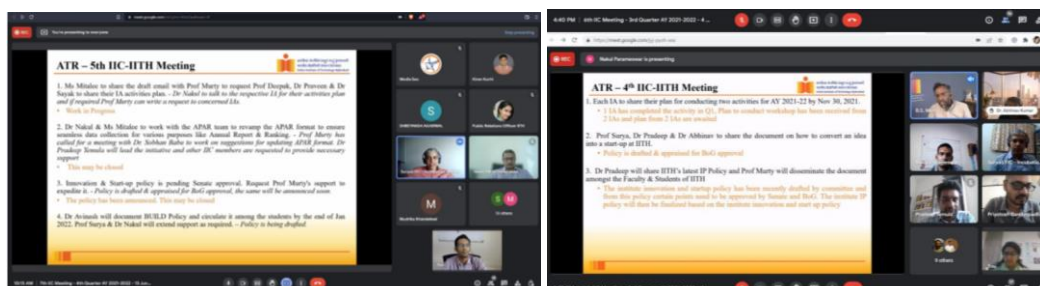


The IIC at IIT Hyderabad has been very proactive in taking up initiatives that go a long way to build the spirit of innovation and entrepreneurship amongst the student community. The work has really been phenomenal, and I am very glad to be a part of it.

Mr Vaibhav Kumar
BTech 4th Year
General Member (Students), IIC-IITH

M. Images

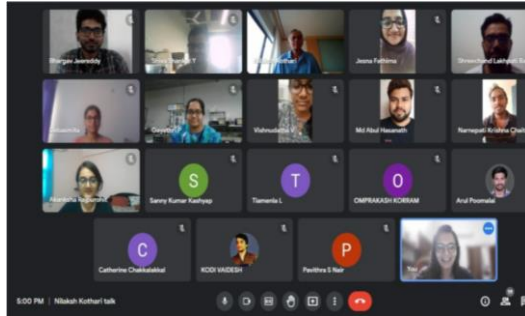
- IIC Meetings' Screenshots:**



- Snapshots of few entrepreneurship & innovations sessions at IITH:**



A seminar by Dr Nilaksh Kothari for World Environment Day



“Nurturing Teacher Effectiveness by Innovating Oneself” A Session by Department of EM & IIC



Interesting Problems in Autonomous Vehicles "What does the industry care about and how to get funded" A talk by Dr Srikanth Saripalli, Professor, Texas A&M University.



Workshop on Basic Concepts in Intellectual Property Rights



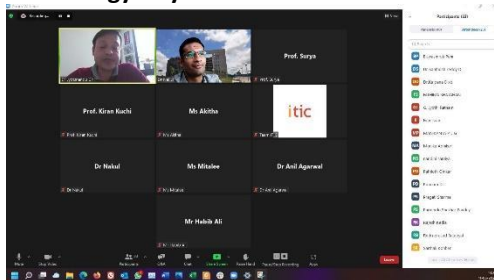
Session on Opportunities for Graduating Environmental Engineers



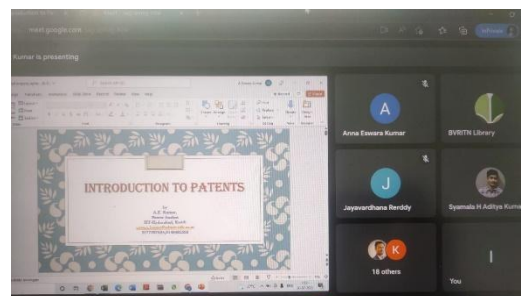
Seminar on Design Education Course for Class V CBSE school students



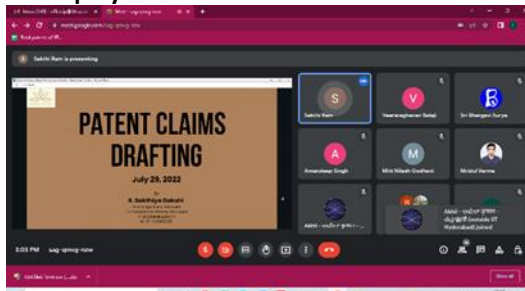
Online Event to Commemorate National Technology Day



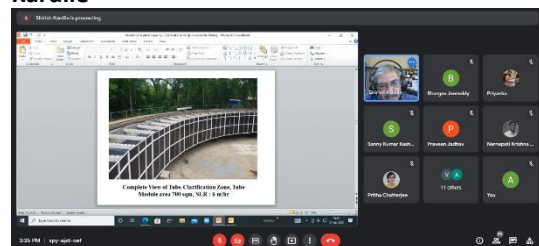
Webinar on “Introduction to patents” by Mr.A.E.Kumar



Webinar on IPR and IP Management for Startup by Ms.R. SAKTHIYA DAKSHI

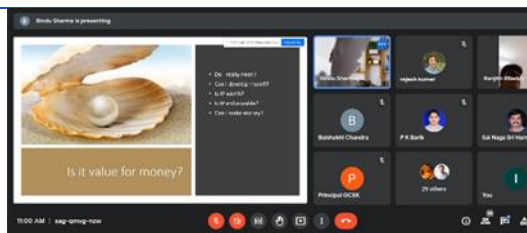


Augmentation and Upgradation of Existing Water Treatment Plants by Mr. Shirish Jayant Kardile

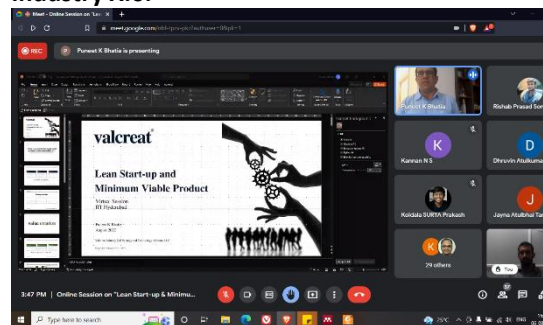


Webinar on Technology Transfer by Ms Bindu Sharma, Founder & CEO, Origin IP Solutions

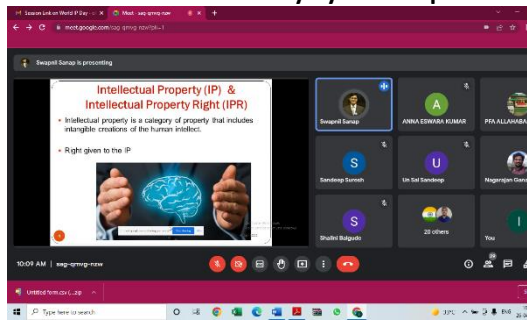
Session on “Lean Start-up & Minimum Viable Product/Business” by Mr Puneet K Bhatia,



Managing Partner and Founder, Valcreat Industry X.0.



A webinar on World IP Day by Mr.Swapnil



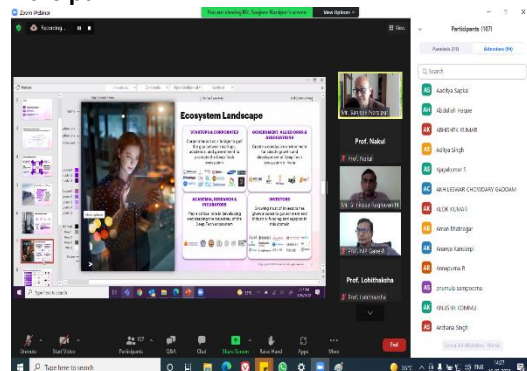
International Pi Day



The talk, under FOSTER Vol. II by Mr. Shashank Varanasi on “Open Source Innovation and You”



Symposium on DeepTech Entrepreneurship: Opportunities and Gaps by Mr. Sanjeev Narsipur.



T-Hub Tour



Session on Achieving ‘Value Proposition Fit’ & ‘Business Fit’ by Mr. Vagish Dixit, Chief Engagement Officer -Alpla Global : Managing Director & Partner of Alpla India



Special Talk on World Entrepreneurs Day by Dr B V R Mohan Reddy, Founder Chairman – CYIENT and Chairman Board of Governor, IIT Hyderabad

Session on “Lifecycle of a solution and prototyping session” Anay Mashruwala, Partner, Head Marketing & Quality Control at M/S Venus Engineering Works



Orientation Session for all students & faculties of the Institute by Innovation Ambassadors by Dr M P Ganesh.



Session on "How to plan for Start-up and legal & Ethical Steps" by Mr Shriyay Sheth, Co-Founder, Legalwiz.in.



"Interactive Session on Intellectual Property Rights (IPRs) and IP management for Startups" by A S Rao, Innovation Consultant, Director Academics, IFIA.



Interactive Session/Mentoring Session with "Successful Start-up founders" (Entrepreneurs in Campus) by Keyur Balavath, Founder & CEO, Plutomen.

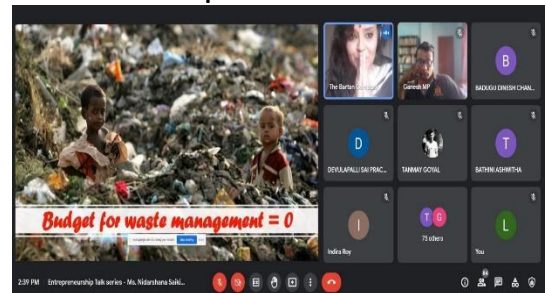


Session on "Accelerators/Incubation - Opportunities for Students & Faculties – Early-Stage Entrepreneurs" by Dr Nandita Sethi, Founder & MD of The Entrepreneur Zone (TEZ).

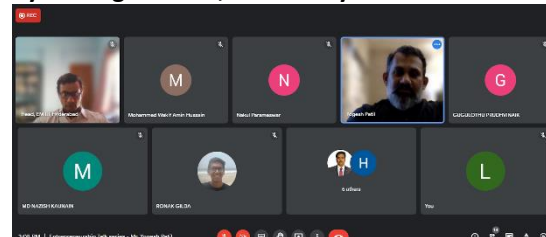
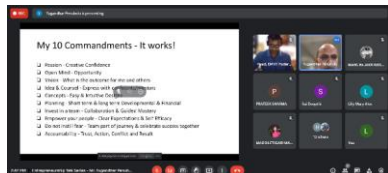
Entrepreneurship Talk series (eighth lecture) by Ms Nidarshana Saikia Das, ex-Marketing Communications professional.



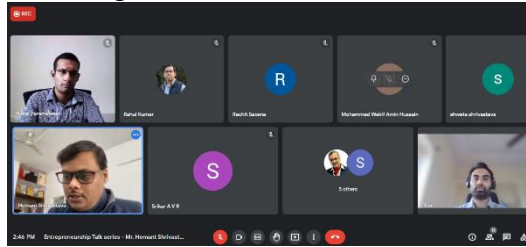
Entrepreneurship Talk series (eighth lecture) Mr Yugandhar Penubolu, Founder & CEO of Winzard Solutions Private Ltd and Badi Soch Innovations Private Ltd.



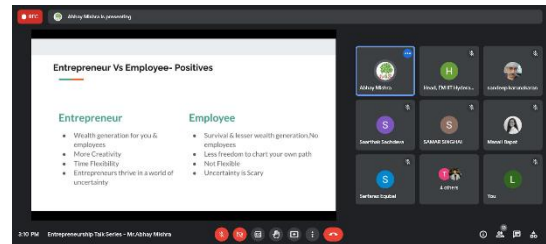
Entrepreneurship Talk series (eighth lecture) by Mr Yogesh Patil, CEO of Skymet



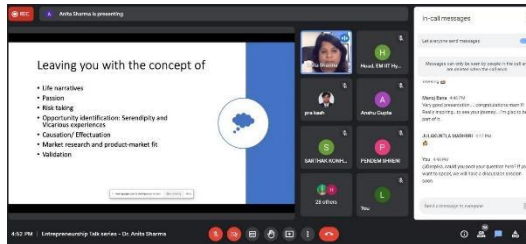
Entrepreneurship Talk series (seventh lecture) Mr Hemant Mishra, founder and CEO of Sociocharge.



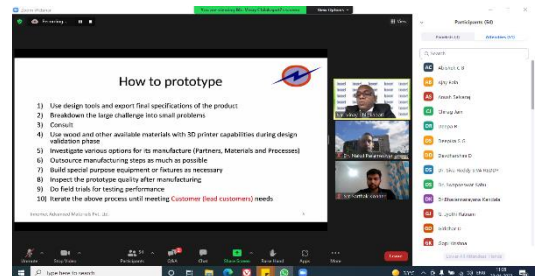
Entrepreneurship Talk series (eighth lecture) by Mr Abhay Mishra, Founder & CEO at Nutrisage Life Care & BetrU Innovations Pvt Ltd.



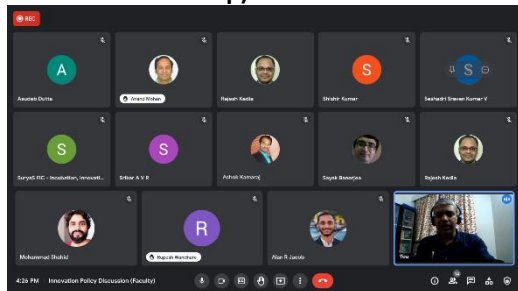
Entrepreneurship Talk series (ninth lecture) by Anita Sharma is a professor, entrepreneur, and YouTuber.



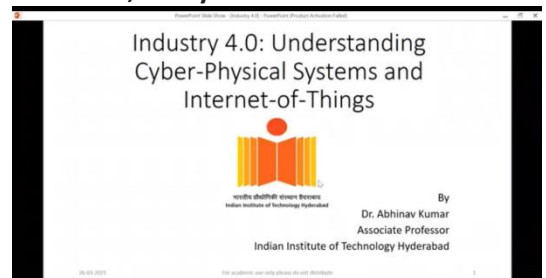
Workshop on Prototype/ Process Design and Development "Prototyping by Mr Vinay Chilakapati, CEO at Innomet Advanced Materials Pvt Ltd.



De-briefing Session on "How to plan for Start- up and legal & Ethical Steps" by Prof Suryakumar S (Faculty-in-Charge: Incubation, Innovation & Startup)



lecture on Industry and Understanding Cyber-Physical Systems & Internet-of- things Dr Abhinav Kumar, Associate Professor, IIT Hyderabad



Innovation & Entrepreneurship in HEIs for Aatmanirbhar Bharat & Celebrating 75 Years of Independence -Azadi Ka Amrit Mahotsav



"11-day Skill Development Workshop: Ceramic and Pottery"



Session on "Branding and storytelling in the digital era Under Business Plan/ Prototype" by Ms Jocelyn Joseph, Co- Founder, Client Management at the Brandit Co.



Session on Types of Business Models by Viveck Verma, Founder, Upsurge Global & senior advisor at Telangana State Innovation Cell.



N. Contact

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Convenor, IIC-IITH

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