

Annexure - IV

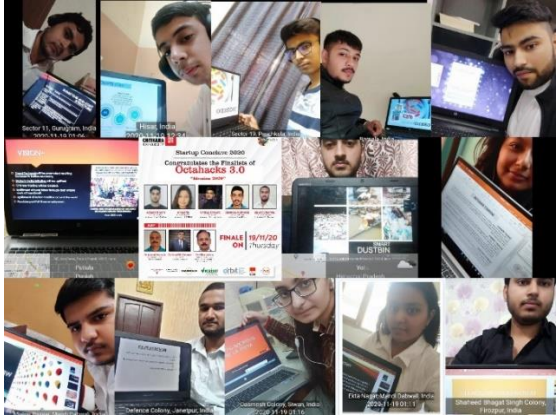
NewGen IEDC Under the Aegis of NSTEDB, DST, Govt. of India, New Delhi


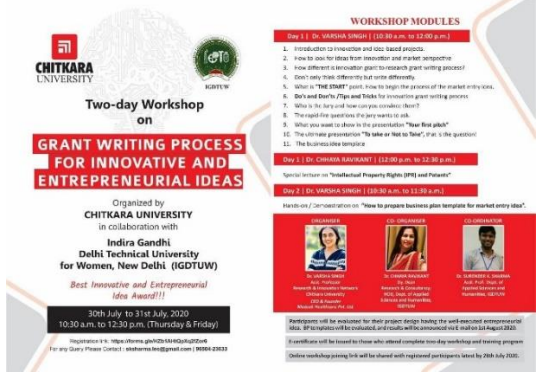
PROFORMA FOR SUBMISSION OF PROGRESS REPORT



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| Name of the College/Institution hosting NewGen IEDC | Chitkara University, Punjab Chandigarh-Patiala National Highway (NH- 64), Village, Jansla, Rajpura, Punjab 140401 | |
| Year of starting NewGen IEDC | 2019 | |
| Name of the Head/Principal of the Institution/College | Dr. Archana Mantri Vice Chancellor, Chitkara University, Punjab | |
| Name of NewGen IEDC Coordinator | Sagar Juneja | |
| Contact Details of NewGen IEDC Coordinator | 9625441043 • Mobile Number • E-Mail ID sagar.juneja@chitkarauniversity.edu.in | |
| Financial Details | Sanction Order No./ Date | Amount Sanctioned |
| Previous Sanction Order Details | 1. EDII/DST-NewGen-IEDC/18-19/05 dated 13/11/2018 | 6,000,000 (First Year) |
| | 2. EDII/DST-NewGen-IEDC/18-19/05 dated 13/11/2018 | 4,750,000 (Second Year) |


Initiatives/Activities Undertaken as per the Action Plan Submitted:

[A] To inculcate the spirit of innovation and entrepreneurship amongst S&T students

| # | Activities | Outcome/Achievements |
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| 1. | Ideation 2020 | <p>Chitkara ACM Student Chapter (Department of Computer Science and Engineering) in collaboration with Chitkara University Centre for Entrepreneurship Education & Development and Chitkara University NewGen IEDC organized the Ideation 2020 hackathon from 15 Oct – 19 Nov 2020. A total 186 teams participated in the event. It aimed at increasing disruptive thinking among the young generation and was held exclusively for the first-year Engineering students of Chitkara University. The 20 teams were selected for the third round which was held on 7th Nov, 2020 and 5 teams were shortlisted out of them which further moved to Start-up Conclave 2020. The top three winners were encouraged with a certificate as well as cash prizes of Rs 5000/-, Rs 3000/- and Rs 2000/- respectively. The participants were also given certificates as a token of encouragement.</p>  |

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| 2. | BAJA SAE INDIA | <p>Chitkara University in association with BAJA SAE India and Mahindra Group hosted the second leg of the 13th iteration of Mahindra BAJA SAE India 2020 under the theme 'Breaking Conventions' in the month of March 2020. The event witnessed 31 out of 77 BAJA teams complete the endurance round in the mud track. The event received a great response from all zones (Western, Northern, Eastern & Southern zones) in India.</p>  <p>BAJA SAE INDIA 2021 organised its preliminary round where young engineers from all over India showcased their designs of All-Terrain Vehicles to a panel of judges from the renowned automotive industries over 2 day events held on December 12th and 13th, 2020. A total of 200 teams participated in the event from all over institutes in India.</p> |
| 3. | Workshop on Grant Writing Process for Innovative & Entrepreneurial Ideas | <p>A two-day workshop on Grant Writing Process for Innovative & Entrepreneurial Ideas was conducted in the month of July 2020 in collaboration with Indira Gandhi Delhi Technical University for Women, New Delhi. A special lecture was delivered on Intellectual property rights (IPR) and Patents. The hands-on was done on “How to prepare business plan template for market entry idea”.</p>  <p>The flyer details the following information:</p> <ul style="list-style-type: none"> Organized by: CHITKARA UNIVERSITY in collaboration with Indira Gandhi Delhi Technical University for Women, New Delhi (IGDTUW) Best Innovative and Entrepreneurial Ideas Award!!! Dates: 30th July to 31st July, 2020 (10:30 a.m. to 12:30 p.m. Thursday & Friday) Workshop Modules: <ol style="list-style-type: none"> Introduction on Innovation and Idea based process How to look for ideas from innovation and market perspective How different is innovation grant to research grant writing process? Don't copy ideas differently but copy differently What is "THE START" point. How to begin the process of the market entry idea. Get and Start-Up and Scale for innovative grant writing process Who is the jury and how can you convince them? The right time and how to get ready to ask What you want to follow in the presentation "How Best pitch" The ultimate presentation "To take or Not to take", that is the question The business idea template Day 1 (Dr. LOHANA RAJIVANI) 10:30 a.m. to 12:30 p.m. Special lecture on "Intellectual Property Rights (IPR) and Patents" Day 2 (Dr. VARSHA SHIRDI) 10:30 a.m. to 12:30 p.m. Hands-on / Demonstration on "How to prepare business plan template for market entry idea" Speakers: <ul style="list-style-type: none"> Dr. LOHANA RAJIVANI (Co-ordinator): Research & Innovation, IIT Bombay, Mumbai, Maharashtra, India Dr. VARSHA SHIRDI (Co-ordinator): Research & Innovation, IIT Bombay, Mumbai, Maharashtra, India Dr. ANURAG SHARMA (Co-ordinator): IIT Bombay, Mumbai, Maharashtra, India Participants: Participants will be selected for their project design/idea for work described entrepreneurial idea. If no materials will be provided, and results will be announced not earlier than August 2020. Registration: Registrations will be closed for those who attend complete one day workshop and training program. Details: Details for getting in will be shared with registered participants. Email By 29th July 2020. |
| 4. | 3D designing and 3D printing workshop | <p>A five-day workshop on 3D Designing using a free and easy to use CAD tool with demonstration of 3D printing was organized in the month of August 2020. The workshop was a hands-on program in which 5 useful products were designed and 3D printed. The workshop was organized by Mr. Sagar Juneja, Mr. Chanpreet Singh and Ms. Aishwarika Sharma. The main aim of workshop was convert wonderful creative ideas into 3D reality. The entrepreneurs, industrialists, academicians and students participated from all over India in the workshop.</p> |

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| | |  <p>The poster for the 'Five-day Hands-on Workshop on 3D Designing and 3D Printing' is organized by Chitkara University, Chitkara Institute of NewGen IEDC, and IETE. It features the text 'CONVERT YOUR CREATIVE IDEAS INTO WONDERFUL 3D REALITY' and lists several bullet points about the workshop. It also identifies two resource persons: Mr. Champreet Singh and Ms. Anshuwanika Raj Sharma. Registration details and contact information are provided at the bottom.</p> |
| 5. | FDP on PCB Designing | <p>“0 to Gerber in Ten Hours”, a 5 day FDP on PCB Designing was conducted from 1st to 5th September 2020. The course was designed for enthusiastic learners in the domain of electronics circuit designing. It covered the key essentials of PCB designing skills. Learners got to learn the technical details of PCB design from scratch to Gerber generation. The course was designed on the top-most industrial-grade circuit design tool i.e. Altium.</p> |
| 6. | Robo Mania | <p>The IETE SOCIETY (Institution of Electronics and Telecommunication Engineers) conducted an event named “Robo Mania” for 1st, 2nd and 3rd year on 21st January, 2021. In this event, students were given one week’s time to make a robot by using a board and after making of robot they had to upload the video of working robot in the google classroom as it was an online event. In the video, they had to make the robot move for 3 seconds straight and then the robot had to take a right turn and move for 3 seconds further and then it had to take a left turn and move for 3 seconds again and then in the end it has to turn 180 degrees. The objectives of the event “Robo Mania” was to make students aware with the working of robots and how to use the board accordingly to make robot move according to the given criterion. The main objective of this event was to make students explore different boards and make working robots on their own.</p>  <p>The image shows a close-up of a student's robot project. It features a breadboard with various electronic components, including a microcontroller and several jumper wires. The robot is mounted on two black wheels. A white name tag is attached to the front of the robot, with the name 'RISHABH' and the ID number '2010992010' written on it in black marker.</p> |
| 7. | 'TECHNOVANZA' | <p>A technical event named “Technovanza” was conducted on 24th Feb, 2021 for 1st and 2nd year students. In this event, students had to make circuits on TinkerCad (online software) given by the organizing team. Firstly, they were given a puzzle to solve, related to the components of the circuit and then they were taught TinkerCad software by the organising team then they had to make the circuit and stimulate it afterwards on TinkerCad itself. In this way, students made a lot of circuits according to which were given to them. The Objective of the event was to make students aware about different circuits as well as TinkerCad software. Some students from 1st year were new to this software, so they gained a lot of knowledge of how to make a circuit and stimulate it and find errors if any.</p> |

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| 8. | IPR Course for PG students | A course on Intellectual Property Rights (IPR) was designed for the post graduate students from Dec 2020 to Jan 2021. The aim of course was to create awareness among students regarding innovation and how to protect their innovation by filing patents. The outcome of the course was collection of some good patentable ideas for which patents were filed. |
| 9. | Grant Writing Process for Innovative & Entrepreneurial Ideas | A two-day workshop on Grant Writing Process for Innovative & Entrepreneurial Ideas was organized by Chitkara University in collaboration with Indira Gandhi Delhi Technical University for Women, New Delhi on 30th - 31st July 2020. A special lecture on Intellectual Property Rights (IPR) and Patents was also delivered. |
| 10 | Workshop on Internet of Things: Virtual environment | Computer Society of India (CSI) Student Chapter, under the aegis of the Department of Computer Applications, Chitkara University, Punjab organized 2-Days workshop on "Internet of Things: Virtual environment" on 5th - 6th Jan 2021. A total 122 Students from CA department participated in the workshop. Students learnt about the interfacing of sensor with Arduino board. Students Learned IoT implementation and its applications in various real-life scenarios. |



[B] To identify, develop & commercialize students' innovative ideas

| # | Activities | Outcome/Achievements |
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| 1. | NOVATE 2020 | Chitkara University Organized its 4th Annual Problem Solving Challenge NOVATE 2020 on 25th June 2020. This time NOVATE 2020 focused on set of challenges brought by COVID-19. A webinar-cum-boot camp was organized on May 1, 2020 in order to give prospective participants right direction for the competition, and at the same time motivate them to find solutions to COVID-19 challenges. Theme of NOVATE+ 2020 was derived from three step process followed for Prayer as described in Norman Vincent Peale's book entitled The Power of Positive Thinking. This three-step process include – Prayerise, Picturise and Actualise. A total of 109 submissions were made in the Prayerise segment of the competition. A total of 167 submissions were made in Picturise segment and that way a total of 276 submissions were made to NOVATE+ 2020. In the Actualise round, shortlisted teams from both Prayerise and Picturise rounds were given an opportunity to develop their proof-of-concepts and submit the same in the form of 5 minutes' video for evaluation. 63 video submissions were received in the Actualise round that were evaluated by the panel and Top 30 ideas were selected for the Jury round that was held as a live online session on June 25, 2020. Four teams won prototyping funding of INR 250,000 each from |

Chitkara University NewGen IEDC.



2. SIH 2020


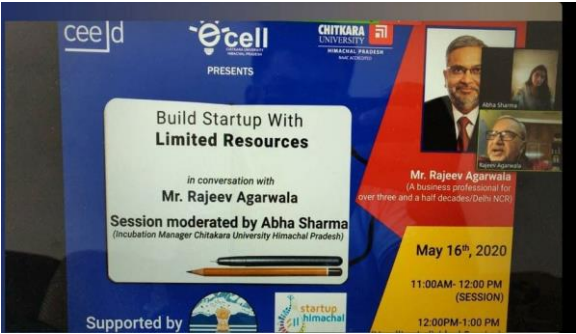
Chitkara University, Punjab was selected as one of the nodal centers to facilitate the SIH software edition operations and to host the problem statements from the Department of IT & Cyber Security, DRDO. The hackathon was held in Chitkara University from 1st – 3rd August 2020. This year in SIH2020 a total of 25 teams having 150 participants competed against 5 problem statements given by the Department of IT & Cyber Security, DRDO. Each Problem statement had a winning amount of Rs 100,000. The SIH2020 has been supported by NewGen IEDC.



3. Startup Himachal Hackathon 2020

The Startup Himachal Hackathon 2020 was organized by Chitkara University on 27th Oct 2020. The top three winners were awarded by cash prizes and grant upto 3 Lakh per year. The incubation space was also provided to the winners. The selected entries got a chance to set up their own company and apply for incubation under Startup Himachal. The selected teams won a monthly sustenance allowance of Rs 25000/- per month (Twenty-five thousand) from Government of Himachal Pradesh for a period of 1 year amounting to 3 lakhs p.a. There were

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| | | <p>cash rewards to the top three winners offered by the Govt of HP. This competition was open for faculty, innovators, patent holders and research scholars.</p>  <p>The poster for 'Startup Himachal Hackathon' features logos for CEE d, Chitkara University, HPCSD, and CURIN. The main title is 'STARTUP HIMACHAL HACKATHON' with a subtitle 'A Special Edition for FACULTY Under Startup Himachal Scheme'. It lists four jury members: Dr. Varinder Kanwar (VC, Chitkara University), Dr. Archana Mantri (VC, Chitkara University), Mr. Sanjay Kanwar (Deputy Director of Industries), and Mr. Sameer Walia (Director, Centre for Entrepreneurship Education and Development).</p> |
| 4. | Start-up Conclave 2020 | <p>Organized with a strong focus on promoting entrepreneurship in India & to inspire, nurture & handhold budding entrepreneurs from the Indian Startup</p>  <p>The poster for 'Startup Conclave 2020' is for the Global Entrepreneurship Week (GEW) 2020 in India. It features logos for Chitkara University and GEN INDIA. The event is on 19th Nov, 2020, from 10:00AM to 2:45PM. It lists speakers: Dr. Ing. Itham A. Habibie (Chief Executive, National ICT Council), Ankur Warikoo (Co-Founder - Nearbuy.com), Yatin K Thakur (Founder - Coverfin), and Sanam Kapoor (Founder of La Pino'z). A QR code is provided for registration.</p> |
| 5. | Octahacks3.0 | <p>Octahack, an annual flagship event was organized during 20th – 22nd Nov 2020 on virtual mode. More than 1000+ students in 400+ teams participated in the event. To give this virtual mode an offline feel we collaborated with Airmeeet that made this event 'one of the best' virtual hackathons of India. This hackathon was a unique opportunity to merge creative ideas with technical skills to build something exemplar. The winners were awarded with cash prizes and goodies worth Rs 1 lakh. In addition to this, the teams were awarded with goodies from Google and DevFolio as well.</p> |

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| | |  <p>The poster for OctaHacks 30 'EIGHT' Tracks Hackathon is colorful and features various logos of sponsors and tracks. The tracks include Smart City, Startup, Environment & Agriculture, Finance, Human History, Security, Health, and Education. It also lists numerous sponsors like Devfolio, Fyrd, and others. Contact information for student and faculty coordinators is provided at the bottom.</p> |
| 6. | Build Startup with Limited Resources | <p>We organized an online session on "Build Startup with Limited Resources" on 16th May 2020. The session was attended by over 40 young entrepreneurs mainly students, which included 26 bright ideas. Mr. Rajeev Aggarwal our keynote speaker very well integrated the current status with future expectations. He also added that it's not important to raise capital but to have cash flow with which you can easily manage your resources and create capital as well. The objective of session was to inculcate the spirit of entrepreneurship among all students.</p>  <p>The poster for the session 'Build Startup With Limited Resources' features the logos of CeejD, eCell, and Chitkara University. It mentions the session is in conversation with Mr. Rajeev Aggarwala, moderated by Abha Sharma (Incubation Manager, Chitkara University Himachal Pradesh). The session is dated May 16th, 2020, from 11:00 AM to 12:00 PM. It is supported by startup Himachal.</p> |
| 7. | Promotional event | <p>A promotional event was organized by Chitkara University NewGen IEDC on 23rd January 2021. The main objective of the event to create an awareness about the funding and facilities at Chitkara University NewGen IEDC center. Over 40 people were gathered in the ceremony and were motivated to apply for projects under NewGen IEDC. The event was hosted by NewGen IEDC and all guests were facilitated by Dr. Archana Mantri – Chief Coordinator, Chitkara University, NewGen IEDC.</p> |
| 8. | Progress Presentations of NewGen IEDC projects | <p>Progress presentation sessions of NewGen IEDC funded projects were held during March 5-March 7, 2020 to evaluate the progress of projects that were sanctioned in 2019. 21 active projects of NewGen IEDC made their presentations in which they showcased technical progress on their prototypes as well as status of their budget expenditure. Dr. Archana Mantri – Chief Coordinator, Chitkara University, NewGen IEDC was the chairperson of the committee that reviewed the progress presentations. Other members of the committee included Dr. Rupesh Gupta (Department of Mechanical Engineering), Mr. Amit Pandey (Department of Electronics Engineering), Dr. Varinder Singh (Department of Civil Engineering), Mr. Gurpreet Singh (Department of Mechatronics Engineering), Ms. Nishu Bali (Department of Bachelor of Computer Applications), Mr. Sumit (Department of CCAE) and Mr. Sagar Juneja (Coordinator, Chitkara University, NewGen IEDC). The committee made crucial observations about projects and gave important pointers that would lead to the successful completion of these projects in the near future. The sessions were coordinated by the entire team of Chitkara University NewGen IEDC – Mr. Sagar Juneja, Mr. Chanpreet Singh, Ms. Aaishwarika Sharma, and Mr. Nikhil Sharma.</p> |

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| | |  <p>The second annual progress presentation session of NewGen IEDC funded projects were held during Jan 27- Jan 29, 2021 to evaluate the progress of projects that were sanctioned in 2020. 18 active projects of NewGen IEDC made their presentations in which they showcased technical progress on their prototypes as well as status of their budget expenditure. Dr. Archana Mantri – Chief Coordinator, Chitkara University, NewGen IEDC was the chairperson of the committee that reviewed the progress presentations. Other members of the committee included Dr. Rupesh Gupta (Department of Mechanical Engineering), Mr. Amit Pandey (Department of Electronics Engineering), Mr. Jaspreet Singh (Department of Civil Engineering), Mr. Gurpreet Singh (Department of Mechatronics Engineering), Ms. Nishu Bali (Department of Bachelor of Computer Applications), Mr. Sumit (Department of CCAE) and Mr. Sagar Juneja (Coordinator, Chitkara University, NewGen IEDC). The committee made crucial observations about projects and gave important pointers that would lead to the successful completion of these projects in the near future. The sessions were coordinated by the entire team of Chitkara University NewGen IEDC – Mr. Sagar Juneja, Mr. Chanpreet Singh, Ms. Aaishwarika Sharma, and Mr. Lovit Kumar.</p>  |
| 9. | India Innovation Championship (IIC) 2021 | Chitkara University is organizing India Innovation Championship (IIC) 2021. The call for application has started from 25th Dec 2020. The Championship is open to innovators, entrepreneurs, designers, thinkers, students, engineers, scientists, coders, trainers, academicians from any background. The event is being promoted so to create awareness. The winners will get awarded by prizes and grants worth Rs 1 Crore. |

[C] To enhance Industry-Academia interaction

| # | Activities | Outcome/Achievements |
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| 1. | Flagship Conferences Organized | National Conference on Advances in Applied Sciences and Mathematics (NCASM-20) was held on September 24-25, 2020 at Chitkara University Punjab with the aims to broadly focus on recent advancements in R&D in the field of Applied Sciences, Mathematics and sharing the information with participating researchers, developers, engineers, students, and practitioners across the globe. Over 200 delegates attended the conference that featured paper presentations, keynote talks, tutorials and a panel discussion. |



1st Online International Conference on 'Cutting Edge Research in Chemistry and Sustainable Environmental Solutions' (CERCHE-2021) was organized by Chitkara University from February 20-21, 2021. The purpose of the conference is to bring researchers of different areas of Chemistry, Environment, and Engineering from world over to discuss on common virtual platform.

CHITKARA UNIVERSITY

CERCHE-2021

Purpose of the conference is to bring researchers of different areas of Chemistry, Environment, and Engineering from world over to discuss on common virtual platform. Researchers are supposed to talk on prominent advances in chemistry and providing sustainable technological solutions for environmental issues. Conference will be providing virtual platform(s) for keynote, oral and poster presentations.

IT WILL GIVE AMPLE OPPORTUNITIES TO DISCUSS AND UNDERSTAND VARIOUS APPROACHES, PHENOMENA OF CHEMISTRY AND WILL FOCUS ON THE FOLLOWING TOPICS:

- ORGANIC CHEMISTRY
- INORGANIC CHEMISTRY
- PHYSICAL CHEMISTRY
- ANALYTICAL CHEMISTRY
- INDUSTRIAL CHEMISTRY
- NANOCHEMISTRY
- GREEN CHEMISTRY
- NATURAL PRODUCT CHEMISTRY
- ENVIRONMENTAL CHEMISTRY
- WASTEWATER TREATMENT
- NUCLEAR CHEMISTRY
- MATERIALS CHEMISTRY
- ELECTROCHEMISTRY
- POLYMER CHEMISTRY
- SUPER MOLECULAR CHEMISTRY

DATE: FEBRUARY 20-21, 2021
TIMINGS: 9:00 AM to 4:00 PM

2. NOVATE 2021

Chitkara University in collaboration with Chitkara University NewGen IEDC has launched Industry-Academia confluence and hackathon - NOVATE+ to encourage academia and take up real life problems of MSMEs, Start-ups and propose a solution. The Hackathon is open to researchers, students, academicians, entrepreneurs, start-ups and MSMEs and will serve as rewarding ground for their collaborative efforts. Total prizes and funding support to be won are worth INR 30Lac. In context to this hackathon various webinars have been organized by Chitkara University NewGen IEDC with an aim to understand the different problems faced by MSME.

NOVATE+ 2021

Confluence of Academia, MSMEs and Start-ups to Address Real World Problems

CALL FOR PROJECT PROPOSALS

Funding Support of Upto **INR 25 Lacs** for all Projects

Call for proposals to be submitted by 15th January 2021

ELIGIBILITY:

- Open to students, academicians, entrepreneurs, start-ups from anywhere in India
- Collaboration with a local MSME industry/start-up is mandatory
- Entrepreneurship should be supported from the partner MSME industry/start-up

THEME:

- We look for project proposals that address real world problems faced by the MSME industry and start-ups of our country
- Problem areas may vary from: energy, training, awareness, infrastructure, etc.

SUBMISSIONS:

- Start-ups/ideas are due by January 15, 2021
- Applicants are required to fill the online submission form - <https://www.chitkara.edu.in>
- Team must include one representative from the partner MSME or start-up
- Proposals will be reviewed by experts, and funding will be awarded to the shortlisted ideas

Additional information:




- Chitkara University is an ISO 9001:2015 certified organization (Quality Management System)
- Chitkara University is an ISO 14001:2015 certified organization (Environmental Management System)
- Chitkara University is an ISO 27001:2013 certified organization (Information Security Management System)
- Chitkara University is an ISO 45001:2018 certified organization (Occupational Health and Safety Management System)

Organized by Chitkara University
 Assisted by NewGen IEDC, and
 (IIT) Technology Park, Gurgaon, Haryana

Web: www.chitkara.edu.in
 Email: ncasm@chitkara.edu.in
 Contact: +91 172 225 1111

3. Design and Development of

A webinar was organized to connect academia and MSMEs. The webinar on Design and Development of Injector Driver Circuit for Diesel engine to reduce air pollution: Problem Definition

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| | <p>Injector Driver Circuit for Diesel engine to reduce air pollution</p> | <p>and Technical Specifications were organized by Chitkara University NewGen IEDC on 21st Jan 2021. A total 20-25 participants attended the webinar in an aim to find solutions to MSMEs problem. The webinar was delivered by Mr. Yogesh Kalia, Founder, Medhaavi Center for Automobile Research, Punjab. The event was attended by faculty, scholars and students.</p>  |
| <p>4.</p> | <p>Generating Fuel Free Electricity using force from moving vehicles</p> | <p>The webinar on Generating Fuel Free Electricity using force from moving vehicles was delivered by Mr. Pawan Bansal, Inventor, Bansal Paper Board Mills, Muktsar, Punjab on 27th January 2021. The aim of webinar was to introduce the problem and find a solution by academicians, scholars and students. Over 40 participants attended the webinar.</p>  |
| <p>5.</p> | <p>Design and Development of Fire alarm system for commercial and residential Buildings</p> | <p>The webinar on Design and Development of Fire alarm system for commercial and residential Buildings was delivered by Mr. Sumit Grover, Founder, Genesis Control, Ludhiana, Punjab on 23rd January 2021. Over 25 participants attended the event. The objective of webinar was to find a solution for the problem of MSME.</p>  |

6. Expert Talks



- An expert session on topic "From Bootstrap to IPO The Journey" was delivered by Mr. Rajdip Gupta, MD, Group CEO Route Mobile Limited on 13 October 2020 from 2:00pm to 3:00pm. The session was streamed live and also on ZOOM platform. Mr. Rajdip Gupta talks about the leadership qualities and revolutionary changes during the transition of IPO industries in his journey for young graduates. More than 100 attendees attended the session.
- An expert talk on India Innovation Championship (IIC), a one-of-a-kind fest launched by Chitkara University to promote an entrepreneurial mindset in teaching, research and training, was organized on February 10, 2021. The aim of the talk was to drive entrepreneurship and accelerate promising Research, Innovation, Demonstration, and Development (RID&D) in the field of technology. Highlighting how Chitkara University strives to promote the spirit of responsible and innovative enterprises, Dr. Adarsh Aggarwal, conducted an interactive session with the participants where he touched almost every aspect of innovation.



- Chitkara ACM Student Chapter in association with department of Computer Science and Engineering and IIC organized a panel discussion on Women in Technology 2021 on 6th March 2021. The event aimed at bringing an amazing line up of speakers, inspiration and actionable insight for empowering women. When one woman helps another, amazing things can happen. Women in Technology aims at empowering girls and women to excel in science, technology, engineering and arts. The panel discussion was conducted online at Zoom platform from 10:30 to 11:30 am and was open for all.
- " Innovation and Branding Strategy" an expert session was organized by on Friday 26 February 2021. The session began with a welcome and inspiring address by Prof. K.D.S Bedi who honored the guest Mr. Ratish Dixit, Senior Manager (L&D) Biocon Biologics Ltd. Mr. Ratish delivered a talk on "Innovation and Branding Strategy". He highlighted the importance of the topic which carries utmost importance in the current times post covid. Mr. Ratish, a seasoned brand manager with vast and abundant experience enlightened the audience with the need to shift focus on innovation in Marketing and Branding Strategy. Students eagerly participated in the interactive session and enjoyed it thoroughly.



- Translating your Research to Commercial product requires a systematic approach. An expert talk by Mr. Narayan Lal Gurjar, COE of EF Polymers Pvt. Ltd. was delivered on 23rd July 2020. The talk included the motivational story of an Engineer who started his journey at age of 16 and achieved a milestone with his approach. Narayan offered a collaboration in the different areas from Engineering, Physics, Arts and Sales.

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| 7. | Smart Nanomaterials workshop by Oak Ridge National Laboratory, USA | <p>A workshop was organized in association with the University of Calgary, Canada, and Oak Ridge National Laboratory, USA on the topic Contribution of Smart Nanomaterials Towards Scientific Community. 26 participants from all over the country attended this workshop that was held during 21-25 September. The resource persons in the workshop were Dr. Jiadeng Zhu (Oak Ridge National Laboratory, USA), Dr. Poliraju (University of Calgary, Canada), Dr. Jyotsna Kaushal, Dr. Pankaj Kumar, Dr. Partha Khanra, and Dr. Mohit Kapoor from Chitkara University India. This workshop shed light on hot topics of sustainable energy materials and nanotools for cancer diagnostics, water treatment, drug delivery, and optical applications.</p> |
| 8. | Workshop on Demystifying the Art of Writing Effective Research Funding Project | <p>Chitkara University organized a workshop on Demystifying the Art of Writing Effective Research Funding Project on 22nd September 2020. The workshop started with ways to search for an open call for funding and keyword alignment of the project proposal with the funding call by taking participants through mock exercise. The participants explored the flavour of writing good research projects and understanding the do's and don'ts of effective proposal writing. It was a combination of exercises and discussions on a sample funding project, participants gained first-hand experience in the grant writing and grant making process.</p>  |

2. Deviation (shortfall) from the proposed action plan (with reasons), if any:

None

3. Other important highlights (new initiatives), if any:

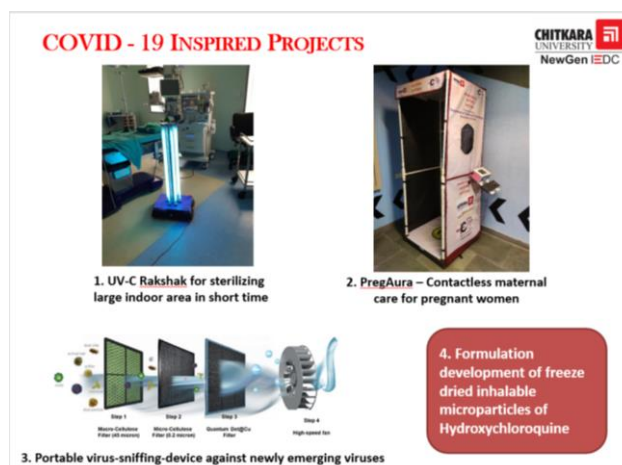
1. We made a very conscious and significant attempt to showcase the impact of Chitkara University NewGen IEDC to both internal stakeholders (university faculty and students) and external stakeholders (industries, MSMEs, start-ups).
2. On January 23, 2021, a sensitization session was organized with different departments of the university. The objective was to acknowledge NewGen IEDC supporters from Chitkara University and to sensitize them about our various activities (all for more active participation from departments).



- Reached out to many MSMEs in the region to explore commercialization potential of NewGen IEDC projects and also to identify industry problems that can be tackled by our students through NewGen IEDC projects funding. Following are some of the MSMEs with whom we have tie-ups –



- Second year witnessed several projects for solving different COVID-19 related problems. These projects have been successfully completed. Below is a snapshot of some of these projects.



4. Student Projects (Please provide the following details for each student project)

15 projects were supported by Chitkara University NewGen IEDC in the second year. The list of projects is given below. Detailed information about each project in the prescribed format along with photographs are given in Annexure A toward the end of this document.

| Sr. No | Team/Project Description |
|--------|--------------------------------|
| 1 | Pepper Spray Pen |
| 2 | Driverless Car |
| 3 | Edu Geo |
| 4 | Mano - Aid |
| 5 | Ethanol Fuel Cell |
| 6 | Portable Virus Sniffing Device |
| 7 | UV-C Robot/ Rakshak |

| | |
|----|---|
| 8 | PregAura |
| 9 | Self-Healing Orthopedic Metallic Implants |
| 10 | Solar Powered Umbrella Type Canopy |
| 11 | Active Cap |
| 12 | Formulation development of Freeze Dried Inhalable microparticles of Hydroxychloroquine and Surfactants for pulmonary delivery for management of ARDS in COVID & SARS Diseases |
| 13 | Development of energy efficient bistable liquid crystal light shutter |
| 14 | Nanocoating for Virus Free Surfaces |
| 15 | Energy efficient and fast process of silica separation from rice stubble |

- **Please Submit three/four high resolution (at least 300 dpi) pictures in jpeg format showing the prototype/product along with the students and their mentor for each project.**

Please see Annexure A

5. Provide a minimum two page case-let each on the two best student projects (either prototype developed or commercialized) from the above list. The case-let should include:

- Student team details (with contact information)
- Brief description about the student start-up
- Startups entrepreneurial journey from ideation to prototype or commercialization along-with 2-3 high resolution photographs
- Contribution of NewGen IEDC in the same
- Future plan

Case Studies of two projects have been added as Annexure B toward the end of this report.

6. Minutes of the Advisory Board Meetings (held twice a year):

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(MoM) Chitkara Univ. NewGen IEDC (3rd Advisory Board Meeting) - March 12 (4:00 - 5:00PM) - Sharing ppt

Sagar Juneja <sagar.juneja@chitkarauniversity.edu.in> to Naveen, S.B., Archana

Respected Sirs,

Thank you for attending the 3rd Advisory Board Meeting of Chitkara University NewGen IEDC that was held on March 12, 2021 during 3:00 - 4:00PM via Google Meet.

We thank you for your appreciation for our efforts at NewGen IEDC. Through this email we are outlining the key remarks/suggestions given by you. We assure you that all your suggestions will be considered and necessary actions will be taken. You will definitely see results/outcomes specific to your suggestions in our next Advisory meeting.

Expert Advice and Suggestions Given by You -

- Projects targeting local problems to be identified and supported
- Projects that are inline with GoI initiatives should be supported.
- There should be more variety/diversity in projects
- There should be more focus on commercialization of the completed projects.

PS: We will send you the list of projects to be considered in the 3rd year by the first week of April 2021.

7. Progress Summary:

| | | |
|----|--|--|
| 1. | Total number of Student Projects supported | 15 |
| 2. | Total fund provided towards supporting Student Projects | 3,750,000 |
| 3. | No. of Patents filed by students | 4 <i>Active Cap - 201911041596, 323330</i> <i>Edu Geo - 202011033693</i> <i>Formulation Development of Freeze Dried Inhalable Microparticles of Hydroxychloroquine and Surfactants for Pulmonary Delivery for Management of ARDS in COVID & SARS Diseases - 202011025625</i> |
| 4. | No. of Patents Granted | 1 <i>Active Cap - 323330</i> |
| 5. | No. of companies/Starts up Set up by Students | 2 <i>80Wash LLP, Active Wtr Wellness Beverage LLP</i> |
| 6. | Social Impact Made, If any | In second year there were four projects that were carried out to solve some of the COVID-19 related problems. 1. PregAura – Smart non-contact distant maternal care for pregnant women during COVID times 2. Formulation development of freeze dried inhalable microparticles of Hydroxychloroquine and surfactants for pulmonary delivery for management of ARDS in COVID & SARS diseases 3. Portable Virus-Sniffing-Device Against Newly Emerging Viruses 4. UV Rakshak - A smart robot to sanitize large indoor wards in hospitals |

ANNEXURE A

Student projects carried out in second year, with details in prescribed format –

1. Team / Project Description:

Title – Pepper spray pen

Student Member – Suryamani Khanna

Mentors – Dr. Inderbir Singh and Dr. Rakesh K Sindhu

Description - PEPS is a high-quality ball point pen with the power of pepper spray in sleek and compact design. It is mainly designed for self-defense especially for women as by seeing today scenario of women harassment at work or public places. It can also be used by women for their safety and in emergency situations like theft and animal attack. Pepper spray pen (PEPS) looks like a normal ball point pen and can also be used for writing in order to hide identity.

Project status at beginning of the Year: it was a theoretical idea, inspired from another similar product.

Interventions made:

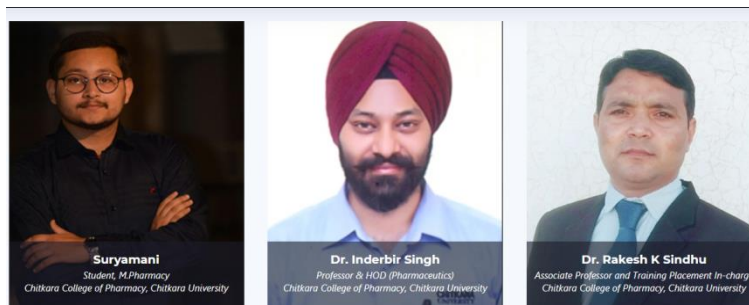
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Supported in 3D designing and 3D printing of the prototype

Current status:

The project has been completed. Prototype has been submitted to NewGen IEDC. We are encouraging and supporting the team for commercializing the product.

Video and Photographs:

Video Link - <https://youtu.be/9wHXTS-17os>



2. Team / Project Description:

Title – Driverless car

Student Members – Karan Aggarwal, Suryansh Gupta and Chahak Jadon

Mentor – Mr. Gurpreet Singh

Description - Our project will focus on indigenous unmanned vehicle which could be used in day time in Chitkara University. The car will be capable of making a map of its surroundings using LIDAR sensor. The model will have a speed of 12 kmph and it will be a electrically operated vehicle. The car will be GPS based and to be operated with our own geographical database. The car will be trained for traffic light signals, traffic signals using image processing and artificial intelligence.

Project status at beginning of the Year: Basic level prototype was available

Interventions made:

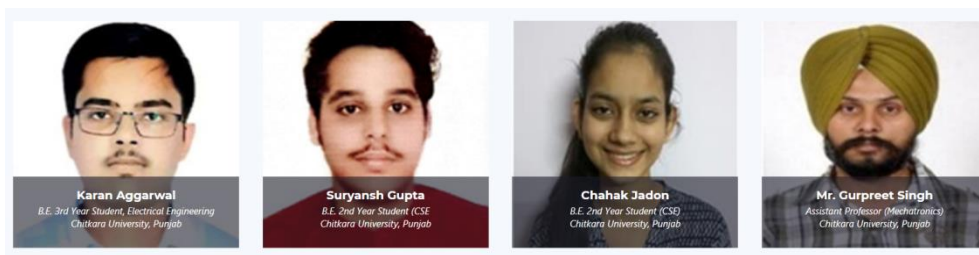
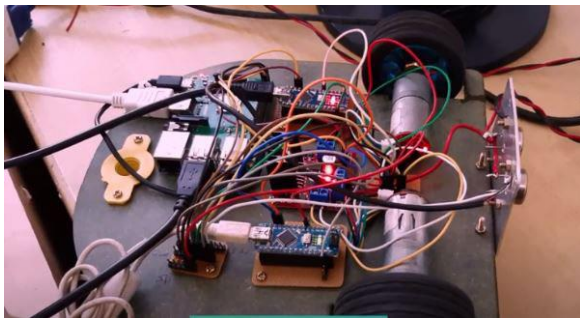
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Helped in identifying important sensors for advance level prototype, also supported in identifying a vendor for procurement of these sensors.

Current status:

Prototype building and testing is going on. They hope to complete the project within next three months.

Video and Photographs:

Video Link - https://youtu.be/PNd33_N2NJQ



3. Team / Project Description:

Title – Edu geo

Student Member – Shubham Gargrish

Mentors – Dr. Bhanu sharma, Dr. Deepti Prit Kaur and Dr. Archana Mantri

Description - Augmented Reality-based Geometry Learning Assistant (AR-GLA) in the form of a tabletop interactive environment, attempts to enhance the learning and retention process of memory by allowing the students to construct, verify, interact and visualize the 3D objects in the real environment. The vector addition has been chosen for 12th- grade mathematics for the execution of AR-GLA. The main objective of the developed application is to assist the students' in their learning and long time

retention of the concepts related to geometry as this topic requires the concepts that continue for some time.

Project status at beginning of the Year: AR application was available, they needed support in building a hardware

Interventions made:

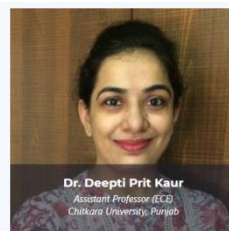
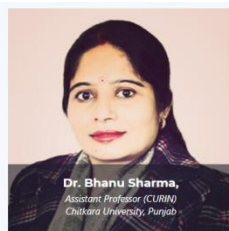
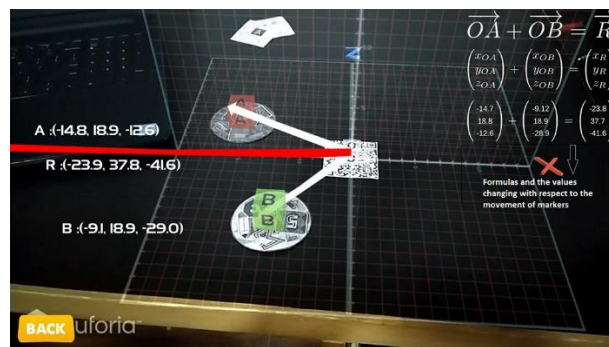
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Supporting in designing of the hardware and 3D markers
- Helping them with identifying various vendors.

Current status:

Hardware development is going on. Patent has been filed.

Video and Photographs:

Video Link - <https://youtu.be/ZK493RMJfY>



4. Team / Project Description:

Title – Mano aid

Student Members – Neha Tuli, Shivam Sharma and Gurwinder Singh

Mentor – Dr. Archana Mantri

Description - Mano-Aid provides cognitive behavioral therapy virtually to mental health patients at their homes with an electronic glove that monitors physiological signals. This will keep the norm of social distancing and provide an opportunity for psychotherapists for work from home solution. There is no chance of opening therapy centers in the near future because of lack of immunity of mental health patients. Mano-Aid is an affordable VR system that can run on any android or ios phone thus no extra device is needed. Monitoring Hand-glove is optional for moderate to severe anxiety patients for therapy sessions. Moreover, Monthly reports will be generated from servers so patients can keep track of their progression.

Project status at beginning of the Year: It was a theoretical idea inspired by one of the COVID-19 related issues

Interventions made:

- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.

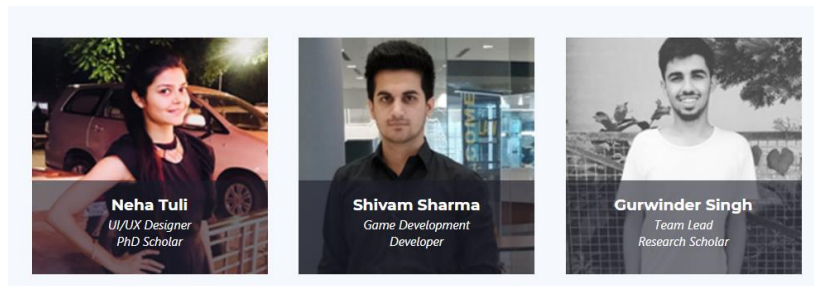
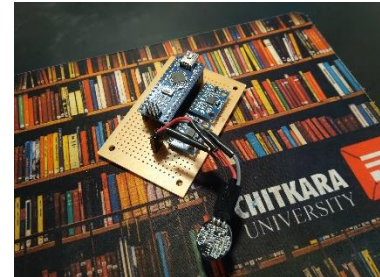
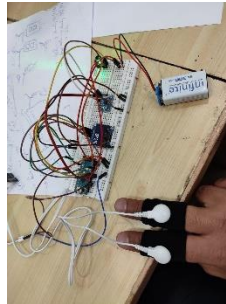
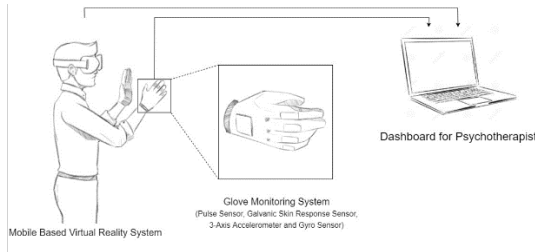
- Supporting them with electronic design and PCB manufacturing.

Current status:

Hardware part is almost complete, team is working on software application development

Video and Photographs:

Video Link - <https://youtu.be/OJI8A6Xqiys>



5. Team / Project Description:

Title – Ethanol fuel cell

Student Members – Vaishali Bhatia, Shabnam Choudhary

Mentors – Dr. Partha Khanra and Dr. Ramkumar K R

Description - Increasing populations and betterment of human society, the energy demands are exponentially increasing. Additionally, lowering the natural fossil fuel storage and produce pollutant by burning of it is intended to developed new energy developing strategies, which should be safety for the environment. Moreover, the scarcity of ground water by unplanned invasive plants are also bring to the brim of survival challenge of civil society. Therefore, development of renewable green energy generator that can maintain the bio-diversity, lowering pollutions and creates good impact of welfare to the society, is becoming a bench-top research topics in scientific communities to supply energy for light or heavy technological devices. Now-a-days, ethanol based proton exchange energy storage device for its high specific energy density (8.0 kWh/kg for ethanol and 6.1 kWh/kg methanol) and low toxicity than methanol, high hydrogen rich molecule and more interestingly it is easy to reproduce from waste materials with lower cost. Therefore, development of 3D-hybrid building block with help of carbon based materials with high catalytic activity is the pioneering technology for industrial interest.

Project status at beginning of the Year: It was a well-researched topic by the team, they have published a paper as well.

Interventions made:

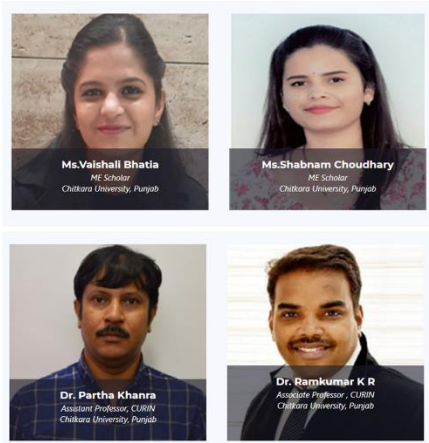
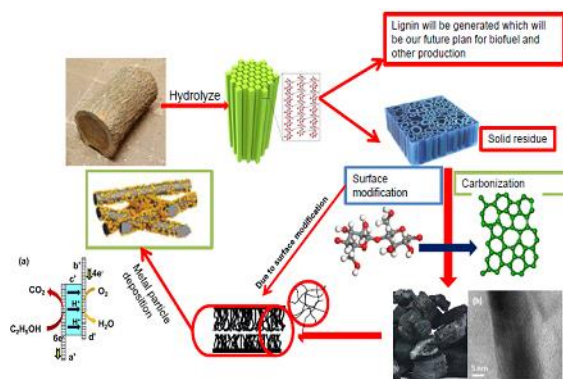
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Supported in procurement of components.

Current status:

Lab testing of different stages of prototype is currently going on.

Video and Photographs:

Video Link - https://youtu.be/5lc6BLIZ_k0



6. Team / Project Description:

Title – Portable virus sniffing device

Student Member – Adhish Singh

Mentor – Dr. Mohit Kapoor

Description - Toxic or polluted indoor air has become a prime cause of increased morbidity and mortality related to microorganism dependent infections and respiratory diseases. Most of the air purifiers in the market use HEPA technology which can filter particles larger than 0.3 microns. This expensive technology is usually used in conjunction with ionizer- or ozone-generating air purifiers that produce harmful by products including ozone and other gases. Quantum dots are such an intelligent nanomaterial with comparable size as viruses and unique biological properties which make them a frontrunner candidate for the development of unprecedented devices to sniff the virus, capture it, and kill it. Our device COVAPUR-AIR is based on the easily scalable heteroatom doped quantum dots weaved on the Cu nanoparticles packed in cannonball type arrangement to capture the viruses. Our technology utilizes these weaved quantum dots along with cellulose filters that restrict particles of all sizes to pass through. As the countries are opening their lengthy lockdowns due to COVID-19, humans are now exposed to even more precarious situations of getting contaminated from COVID-19. Reducing the concentration of viruses in a cluster or packed environment in buses, trains, airplanes, hospitals, industries, offices, schools, colleges, universities, or anywhere else, is the topmost priority for any country. COVAPUR-AIR is a well-designed device, adaptable as per user's requirement, would intercept, and kill the viruses present in the air and provide pure, non-toxic air to breath. The ready working prototype will be tested for its efficiency and reusability based on the biological data. Our initial plan is to install 25 devices in households of customers including pregnant women, senior citizens, asthmatic patients, other people with co-morbidities including respiratory ailments.

Project status at beginning of the Year: It was a theoretical idea inspired by COVID-19 related problems

Interventions made:

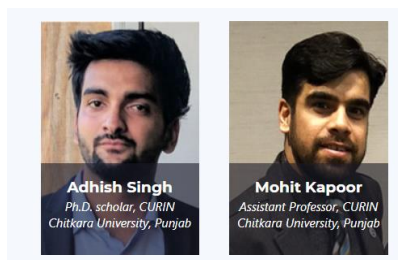
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Supported in identifying vendors

Current status:

- Quantum dots have been made
- Purification of membrane filtration done
- Antibacterial studies of quantum dots pending.

Video and Photographs:

Video Link - <https://youtu.be/etEsPAEfZKc>



7. Team / Project Description:

Title – UV-C Robot/ Rakshak

Student Members – Gyan Singh, Pranav Sikka and Tarun Bhalla

Mentor – Mr. Sachin Ahuja

Description - UV Rakshak is a UV-C empowered robot intended to sterilize large indoor wards in short time. It is operated through a mobile app which automatically notifies once disinfection is completed. The range for operating the robot remotely is 10metres. It has an disinfection area of 12000ft²/hour. This robot uses the UV-C technology with a setup consisting of 6(30w UV-C) lamps. The robot has a battery life of 3 hours and within this time it can disinfect 12 rooms. UV-C is world renowned technology for killing coronavirus with an efficiency of upto 99.9%. The technology has been tested by reputed Medical institutes like Nebraska Medicine, Stamford Medicine and CDC.

Project status at beginning of the Year: It was a theoretical idea inspired by one of COVID-19 related problems

Interventions made:

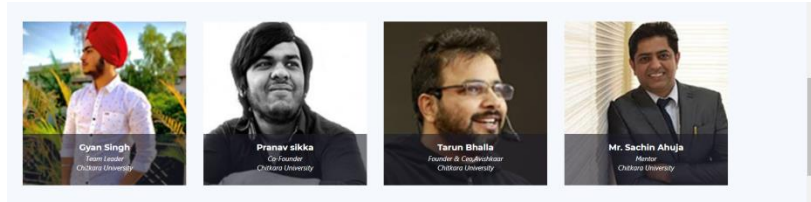
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Support in making mechanical structure of the design

Current status:

Prototype has been completed and has been demonstrated in the lab environment.

Video and Photographs:

Video Link - <https://youtu.be/wiGPTqQHHxc>



8. Team / Project Description:

Title – PregAura

Student Member – Soni Singh

Mentors – Dr. Harmeet Kaur Kang and Dr. Shalli Rani

Description - The whole world is suffering from the nCOVID pandemic. Social distancing is a new norm. Patients are worried to go to the doctors for consultation. Urban patients and less serious patients can get Tele-Consultation. But the serious and the rural patients' needs cannot be sufficed just by a consultation, especially for the PREGNANT WOMEN. Pregnant women are at special risk during Ante-Natal Checkup due to improper hygiene and crowds can get infected with nCOVID-19. India annually has 3 Crore pregnancies, every year.

Project status at beginning of the Year: It was a well-researched idea and team had a basic prototype ready.

Interventions made:

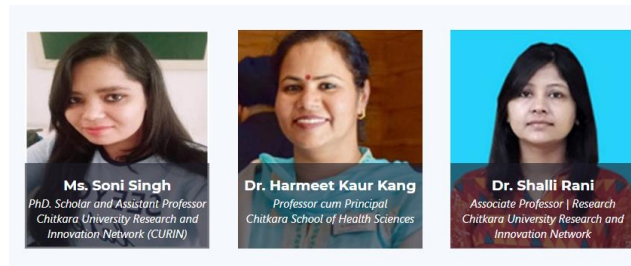
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Support in electronic product design and identification of various components and sensors.

Current status:

Prototype has been completed and tested in the lab environment. Team is looking for industry tie-up for on-field testing and deployment.

Video and Photographs:

Video Link - https://youtu.be/cLC_VZowBds



9. Team / Project Description:

Title – Self-healing orthopedic metallic implants

Student Member – Sahil Gill, Gurmohan Singh

Mentors – Dr. Abhineet Saini

Description - In India, orthopedic surgeons face a huge disease burden of injury, infective, neo-plastic, degenerative, and metabolic conditions. Additionally, growing incidence of diabetes, obesity, osteoarthritis and osteoporosis are further expanding the clinical need. The orthopedic implants market can be broadly divided on the basis of the area of treatment, into 4 major segments: Trauma, Spine, Knee and Hip. The market is shared approximately in an equal ratio between the Trauma & Spine segments on one hand and joints (Knee & Hip) on the other. The present work aims at fabrication and testing of Ti6Al4V alloy (most commonly used biomaterial) based bio-implants for improved bio-functionality. This will be achieved through 3D printed Ti6Al4V alloy material for attaining desired microstructural and mechanical properties, and further applying composite surface coatings of a bioactive material. The resulting specimens are intended to have improved anti-wear properties and bioactivity in terms of Osseo integration capability and antimicrobial properties combined with mechanical properties emulating human bone.

Project status at beginning of the Year: It was a well-researched idea and team had all the theoretical background needed for implementation.

Interventions made:

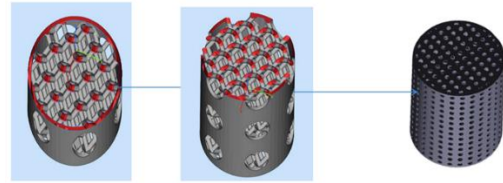
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Support in 3D designing and identification of 3D manufacturer

Current status:

3D printed prototypes have been made and testing is going on.

Video and Photographs:

Video Link - <https://youtu.be/kpgdMb-43LM>



10. Team / Project Description:

Title – Solar powered umbrella type canopy

Student Member – Aaishwarika Raj Sharma

Mentor – Mr. Chanpreet Singh

Description - Solar Powered Multipurpose Canopy is an Umbrella Type Canopy which has a provision of giving 5V, 3A DC Power. Chitkara University NewGen IEDC has developed a solar-powered umbrella type canopy which is ideal for use in places like Gate Security Posts, Outdoor Police Posts, Outdoor Events, and Outdoor Eateries etc. The canopy is powered with a 10 Watt Solar Panel that drives a 12V battery and a solar charge controller to convert solar energy into DC power. Two-independent USB ports have been provided that deliver 5V, 3A power sufficient for charging a smartphone, running a DC fan on a hot summer day and also lighting a LED light during the night if required. A heavy-duty metal base has been made so that the structure remains standalone and doesn't topple in windy condition. Dedicated efforts have been made in the designing of the complete structure so that it is easy to dismantle (for transportation) and looks neat and elegant.

Project status at beginning of the Year: It was a basic idea with well thought of application.

Interventions made:

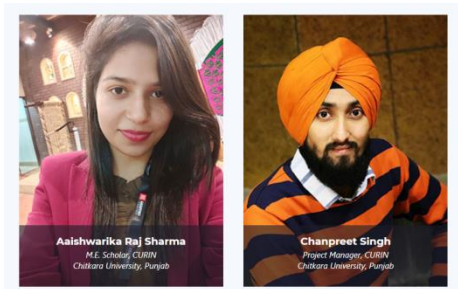
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Support in 3D designing, 3D printing, laser cutting, fabrication of metal frame etc.

Current status:

One prototype has been made and deployed in field. 10 more prototypes have been made for pilot study.

Video and Photographs:

Video Link - <https://youtu.be/9Kjj8nUoBPk>



11. Team / Project Description:

Title – Active cap

Student Members – Pintu Kumar and Anshej Kaushik

Mentor – Mr. Sumeer Walia

Description - Activecap is a beverage packaging industry. The company concepts and developed the world's best infusion cap technology. Activecap helps companies from various business segments to expand their product lines and generate growth using Activecap's unique solutions: a revolutionary way to store and protect vital ingredients until the moment of consumption.

Project status at beginning of the Year: It was a theoretical idea to begin with.

Interventions made:

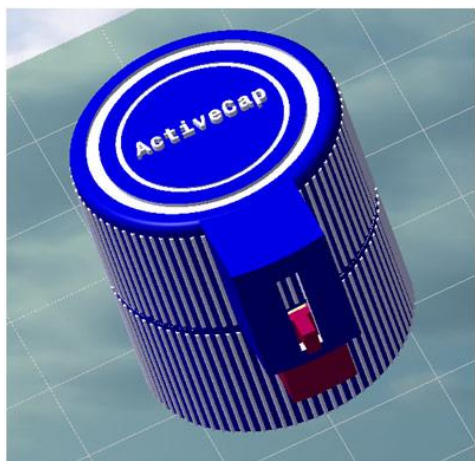
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.
- Complete 3D designing and 3D printing

Current status:

Several 3D printed prototypes have been made and functional testing has been done. 3D animation is being made for showcasing to potential customers.

Video and Photographs:

Video Link - <https://youtu.be/XLOQgXcu2Jc>



12. Team / Project Description:

Title – Formulation development of freeze dried inhalable microparticles of Hydroxychloroquine and surfactants for pulmonary delivery for management of ARDS in COVID & SARS diseases

Student Member – Rupanshi Grover

Mentors – Dr. Neelam Sharma, Dr. Sukhbir Singh and Dr. Sandeep Arora

Description - COVID-19 is a new corona virus disease respiratory illness which is severe and potentially fatal which can cause mortality in severe cases due to alveolar collapse. HCQ could be effectively used in the treatment of SARS-CoV pneumonia. However, the major problems of oral treatment with HCQ can cause possible severe side effects and toxicity; hepatic first-pass metabolism and drug accumulation in liver. Inhalable HCQ microparticles pass through airway & prevent replication of virus effectively & surfactants maintain alveolar capacity. Administration of formulation using an autohaler (Inhaler) produces long duration of action in lungs and further absorption in systemic circulation avoiding first pass metabolism. In turn, inhalable HCQ microparticles could be an important tool for management of acute respiratory distress syndrome (ARDS) in COVID as well as in emergency care clinical team.

Project status at beginning of the Year: It was a well-researched idea and it was inspired by one of the COVID-19 related issues.

Interventions made:

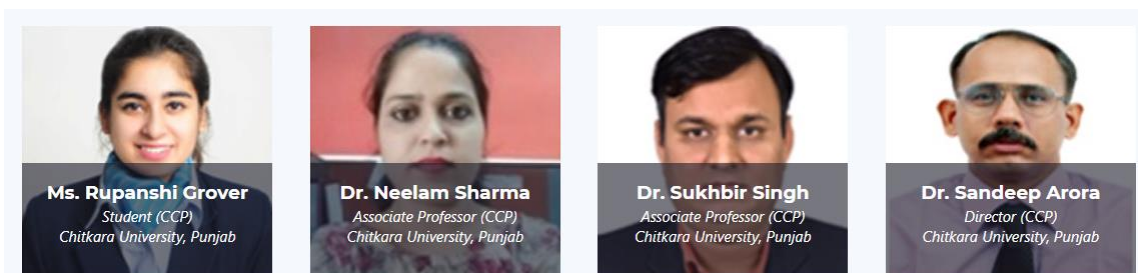
- Provided support in making full-fledged product.
- Provided grant from NewGen IEDC.

Current status:

Team has carried out various studies in the lab and they are yet to showcase some concrete results/outcomes.

Video and Photographs:

Video Link - <https://youtu.be/inKynoNDbSE>



13. Team / Project Description:

Title – Development of energy efficient bistable liquid crystal light shutter

Student Member – Ridhima Gahrotra

Mentors – Dr. Vandna Sharma and Dr. Pankaj Kumar

Description - The aim is to develop energy efficient bistable liquid crystal light shutter. The bistable cholesteric liquid crystals light shutters are used in energy saving buildings, cars and photovoltaic devices. Cholesteric liquid crystal light shutter technologies have potential impact due to several good factors like transparency, scattering, reflection, bistability, easy implementation, less expensive in the process without much complex issues. These films keep the insides of the house cool in summer, and according to the US Department of Energy’s National Renewable Energy Laboratory (NREL), application of smart windows in building is likely to save up to 8% of a building’s total energy consumption. Globally, in display market, South Korea accounts for 47% of display technology powerhouse, despite a lack of core material. In terms of national competitiveness, current material and technology for more than 70% is occupied by Japan. Therefore, for the establishment of the domestic display industry, development of new materials and device technology are absolutely required.

Project status at beginning of the Year: It was a well-researched idea supported by complete theoretical background.

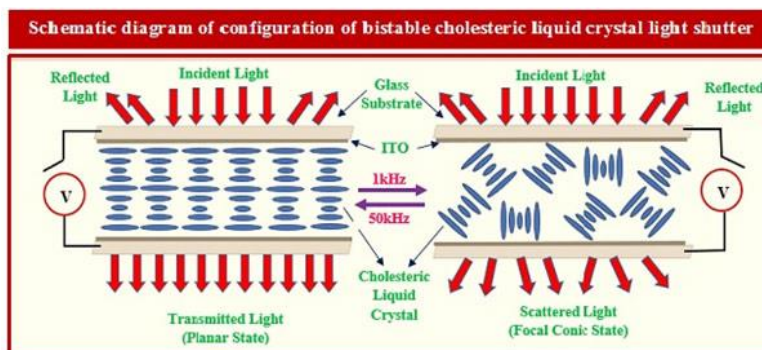
Interventions made:

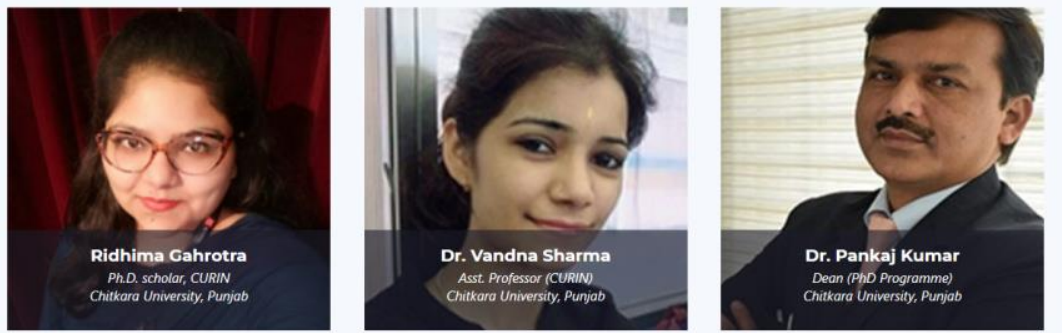
- Provided grant from NewGen IEDC.
- Supported in procurement of all the components.

Current status:

Procurement of all the components has been done and work has just started.

Photographs:





14. Team / Project Description:

Title – Nanocoating for virus free surfaces

Student Member – Adhish Singh

Mentor – Dr. Mohit Kapoor

Description - Nanocoating for Virus Free Surfaces is the effective coating of metal and non-metal surfaces to prevent the infection from viruses. The new coating can be used in hospitals and healthcare facilities, as well as public locations such as schools, airports, trains, buses and cruise ships, where it was shown that the active virus lasted 17 days on surfaces. The coatings contain nanoparticles of safe copper metal ions and carbon dots with gingerol solution that will be effective for weeks or even months. The current coronavirus is transmitted not only through droplet spray, but also via surfaces that can transmit the virus from one person to another. It is important to remember that we are developing coatings that will be effective not only against the coronavirus but also against other viruses, and also against bacteria, so they will be relevant for a wide range of applications.” The anti-viral coatings are based on carbon dots that contain nanoparticles of copper and can be painted or sprayed on surfaces in the form of gingerol solution. These Cu-nanoparticles along with virucidal nanodots will enable rupture of virus membrane and hence deactivation of virus functioning and replication. Studies show that these ions have a strong anti-viral effect, which can eradicate virus particles that adhere to the surface. Because this nanomaterial is extremely stable in gingerol solution, the life time of coating can go up to 60 to 90 days.

Project status at beginning of the Year: It was a theoretical idea to begin with and it was inspired by one of the COVID-19 related issues

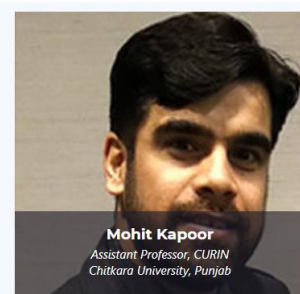
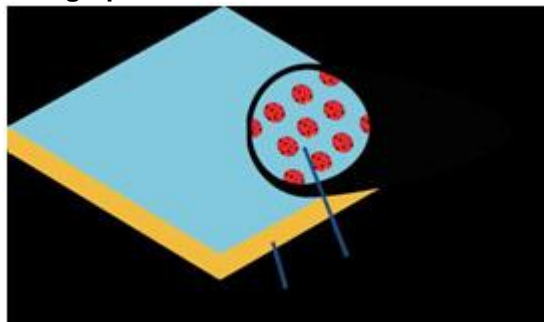
Interventions made:

- Provided grant from NewGen IEDC.
- Supported in procurement of all the components.

Current status:

Procurement of components has been done and work has just started.

Photographs:



15. Team / Project Description:

Title – Energy efficient and fast process of silica separation from rice stubble

Student Member – Bhawana sharma

Mentors – Dr. Gurjinder singh and Dr. Nitin saluja

Description - Silica is one of the significant inorganic compounds which is present in various plants in varying amounts which makes the plant forage unusable as fodder for animal consumption as well causes serious diseases such as silicosis, lung cancer and chronic obstructive pulmonary disease (COPD). Along with this, silica does not biodegrade which leads to difficulties in degrading plant fodder as a whole. So in order to treat plant waste, Sodium Hydroxide (NaOH) under the presence of microwaves (frequency – 2.45GHz) can be used to provide a non-thermal source of energy. The motive behind using microwave was to catalyse the endothermal reaction. The reaction process can be tweaked by manipulating Electric and Magnetic field ratio (E:H). During the experimentation, we found out that by decreasing the ratio (increasing the magnetic field strength), the kinetics of the chemical reaction increases which fasten the process. Silica can thus be precipitated out in the form of Sodium Silicate (Na₂SiO₃).

Project status at beginning of the Year: It was a well-researched idea with all theoretical details.

Interventions made:

- Provided grant from NewGen IEDC.
- Supported in procurement of all the components.

Current status:

Procurement of components has been done, and work has just started.

Photographs:



ANNEXURE B

Case study of two projects

Project Title - Pepper Pen Spray (PEPS)

- **Student team details (with contact information)**

| Name | Email ID | Contact Number |
|---------------------|--|----------------|
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- **Brief description about the student start-up**

As by seeing today scenario of increasing cases of women harassment at work or public places, this team came up with the idea of designing something novel which can be useful in such cases. The team collectively formulated this idea, formed a team and started working on this. Now that the project has been successfully completed, the team is thinking about commercializing the idea.

This product labelled as PEPS is a high-quality ball point pen with the power of pepper spray in sleek and compact design. It is mainly designed for self-defense especially for women as by seeing today scenario of women harassment at work or public places. It can also be used by women for their safety and in emergency situations like theft and animal attack.

Pepper spray pen (PEPS) looks like a normal ball point pen and can also be used for writing in order to hide identity.

It contains solution of naturally derived compounds such as Piperine, which cause intense burning sensation to the skin and extreme discomfort in the eyes. It also contains UV dye for later identification of the subject. This can be easily operated by single hand as by pressing down the actuator with thumb. It doesn't cause severe or permanent damage to the subject and used for safety purposes only.

Salient Features: - Pen design for Personal carry
Used for safety and in theft and attack situations
Naturally derived formula
Leak proof
Stable at wider range of environmental conditions
Non-toxic, Non-flammable
UV component for easy identification of the subject
Cap closure to prevent accidental discharge
Easily refillable
Covers longer distance
Unpressurized (free from propellants)

- **Startups entrepreneurial journey from ideation to prototype or commercialization along with 2-3 high resolution photographs**

Following is the description of journey of the team in their own words -

We have decided to fabricate a special novel pen which not only be used for writing but can also be used in emergency cases such as theft or harassment at work or public places. Primary step includes literature collection about various similar products available in market. Secondly, analysis was done and found that similar products were having several disadvantages such as ozone depletion, highly flammable, expensive, toxic to human health. We solve the problem and design the prototype without such disadvantages additionally, having certain more advantages than those as naturally derived formula and contains special UV component for later identification of victim. Various obstacles were faced during the development as to determine minimum effective concentration of piperine in order to make prototype effective, safe and economical. The obstacle was crossed by conducting out different small trial batches with different concentrations of piperine and other ingredients.



Video Demonstration - <https://youtu.be/9wHXTS-17os>

- **Contribution of NewGen IEDC in the same**

The team feels that NewGen IEDC contributed in the following manner -

- Project could not be completed without the motivation, guidance and mentoring of NewGen IEDC.
- Newgen IEDC continuously assisted us on various aspects.
- Provided us with all the facilities and resources used in developing the prototype.
- Timely Funds and Bills Clearance

- **Future plan**

The team is going to patent the formulation (herbal spray solution) of the prototype. Further, they are also planning to commercialize the prototype in the market at a very economical price.

Project Title – PregAura - IoT Enabled Autonomous Diagnostic Tool for Monitoring the Health Conditions of Pregnant Women in Rural Areas

Student team details (with contact information)

| Name | Email ID | Contact Number |
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• **Brief description about the student start-up**

In the present project proposal, an automatic diagnostic machine is proposed, which will help the rural/remote areas' pregnant women to be monitored automatically and their data will be stored on the cloud for future remedial steps by the government. Data of the particular pregnant women and reports of the doctors' will be exchanged automatically and there will be no human intervention. Thus, it will help the rural areas' women to get the proper care and to get the timely treatment. It will serve the purpose of the automatic data collection of the pregnant women of remote areas and will serve as the best method for data analytics for the particular region. This proposal ensures the timely monitoring of the pregnant women by authenticated doctors. As per WHO's reports released on 16th Feb. 2018, Out of total maternal casualties per day in South Asia, more than 70% occur in India, and 99% casualties in are rural areas of India. This machine will help in reducing these numbers.

The team has built a basic level prototype with NewGen IEDC funding. Using this prototype, team is looking for collaboration and more funding support in order to do clinical trials and pilot study. Once this is done, they hope to register a start-up.

• **Startups entrepreneurial journey from ideation to prototype or commercialization along with 2-3 high resolution photographs**

Following is the description of journey of the team in their own words -

1. In rural areas, most of the pregnant women are suffering from health-related issues and in the lack of appropriate remedies at proper time, they have to face the bad experiences and most of the time in terms of own or fetus death.
2. The proposed work solves an important societal problem, the pregnant women from rural and remote areas of the developing countries face a lot of problems and they are prone to maternal mortality just because of untimely maternal care and lack of awareness.
3. Janani Kavach is the state-of-the-art non-contact vital data collection device designed for pregnant women. The device Janani Kavach consists of various sensors to collect the vital data of the patient. Portable health monitoring booth for pregnant women.



Video Demonstration - https://youtu.be/CLC_VZowBds

- **Contribution of NewGen IEDC in the same**

The team feels that NewGen IEDC contributed in the following manner -

- Patent Support
- IEDC grant Support to make our prototype ready
- Testing and validation support
- Promoting this Product to other funding opportunities.

- **Future plan**

The team is going to collaborate with some industry for carrying out trails and pilot study. They are looking for more funds from various government agencies. They are also working on building an AI prediction model for data collection.