भारतीय प्रौद्योगिकी संस्थान हैदराबाद
कंदी-502 285, संगारेड्डी, तेलंगाना, भारत
फोन: (040) 2301 6033; फैक्स: (040) 2301 6003/32
Indian Institute of Technology Hyderabad
Kandi -502285, Sangareddy, Telangana, India
Phone: (040) 2301 6033; Fax: (040) 2301 6003/32

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

F. No. 1-1/IITH/COORD/2020-21   **Dated. 19th March, 2021**

To
Shri. P.J. Soundararajan,
Under Secretary (IITs),
Department of Higher Education,
Ministry of Education,
Government of India

Sub: The Lok Sabha Unstarred Question Dairy No. 12326 admitted as " Lok Sabha Unstarred Question No. 4195 regarding "Institute Development Plan"– Reg.

Sir,

        With reference to the MoE's email dated. 15.03.2021 on the subject cited above, the point wise reply pertaining to IIT Hyderabad is provided as detailed below:

(a) whether the Government has asked the IITs to develop Institute Development Plan to envisioned in NEP 2020.
Reply: The Ministry may like to reply.

(b) if so, the details thereof
Reply: The Ministry may like to reply.

(c) whether the mobility of faculty members and industry experts between technical institute and industry will promote collaborations between technical institute and industry will promote collaborations between industry and academia and if so, the details thereof.

Reply: Yes, mobility of faculty members and industry experts between IITH and industry will promote collaborations between IITH/academia and industry. IIT Hyderabad has i-TIC Foundation and Technology Business Incubation Centre for promotion of collaboration between industry experts and faculty of IIT Hyderabad. It is also evidenced that mobility of industry experts and faculty members of IIT Hyderabad foster the growth of incubations and academic research.

(d) whether the Government proposes to constitute a taskforce to review use of technology at all IITs and also to accelerate deployment of digital tools in the country and if so, the details thereof;and

Reply: The Ministry may like to reply.

(e) the details of the contribution of the academics during the challenging times of COVID-19 and for their contribution in combating the COVID-19 by new scientific research?

Reply: IIT Hyderabad has dedicated an entire issue of newsletter Combating COVID-19 @IITH (किरIITH, 2nd Edition) to describe about the research undertaken to combat at IITH. The newsletter may be accessed using the hyperlink:
https://pcr.iith.ac.in/files/reports/newsletter/Kiriith-Issue-2.pdf

Few research initiatives undertaken by the IITH, among other things, to combat COVID-19 are mentioned as detailed below:

I. Sanitizers:

1. Prof. Zafar Ali Khan (EE dept.) is working on EM based sanitizer (including UV-C Sanitizers).

II. Masks, Face shields & Protective wear:

2. Pure EV, under the leadership of Dr. Nishanth Dongari (MAE dept.), is working on to bring out a face shield in large quantity in collaboration with RCI Hyderabad.
3. Dr. Renu John (BME dept.), Dr. Suryakumar (MAE dept.) and their team are working on Design and production deployment of reusable face masks. These PPE face masks, which provide better protection than cloth masks are autoclavable and can be reused by changing the filter.
4. One of the incubates of CfHE, Dr. Sai Laxman under the mentorship of Dr. Renu John (BME dept.) has come up with a full design of PPE (protective gear, and face shield), "USafe - Sterilisable Face Shield & Protective Gown", designed, tested and prototyped.
5. Dr. Jyotsnendu Giri (BME dept.) and EaffoCare Innovation developing Antiviral coating for PPE and common surface.
6. The fellows of CfHE are working on an isolation hood for COVID-19 positive patients where healthcare providers can go near without fear and do procedures like intubations and inoculations.

III. Ventilators and other Hardware:

7. Aerobiosys, a startup of Centre for Health Care Entrepreneurship (CfHE) at IITH, has developed a low-cost portable ventilator, Jeevan Lite.
8. Prof. R. Prashant Kumar and his student Mangesh Ratolikar (MAE dept.) have developed a remotely operated mobile robot for hospitals and isolation wards for the

purpose of interacting with patients or persons in quarantine, distributing food or medicines, and collecting trash. Dr. Harish Dixit (MAE dept.) is working on developing flow sensors for the ventilator system.

9. Dr. Nishanth Dongari (MAE dept.) is developing DC motors for ventilators.
10. Dr. Nishanth Dongari (MAE dept.) is developing Lithium batteries for thermal scanners and medical equipment.
11. Dr. Amit Acharyya & Dr. Ashudeb Dutta (EE dept.) and their team through their startup "Sensehealth" at iTIC IITH, has developed "Low-Cost One-stop ECG Solution functional as (a). Ambulatory (inside ambulance), (b). Hospital, (c). at home (during isolation period) and as (d). Holter in COVID-19 pandemic."
12. Dr. Renu John (BME dept.) is working through CfHE at IITH on efficient pulmonary rehabilitation system for post ventilator patients for efficient prognosis and a low-cost lab on a chip for detection of COVID-19 virus with fast turn over results.

IV. Drugs & Vaccines:

13. Dr. Ashudeb Dutta, Dr. Soumya Jana and Dr. Shiv Govind Singh (EE dept.) are developing a smart wearable patch for the prevention of quick spread COVID-19 pandemic.
14. Dr. Ranjith (MSME dept.) & Dr. Aravind Rengan (BME dept.) have filed a patent on the technology and are in the process of submitting a manuscript.
15. Dr. Ashish Misra's Laboratory (BT dept.) is working on designing and developing DNA and mRNA-based vaccine candidates for SARS-CoV-2.
16. Dr. Ashish Misra's Laboratory (BT dept.) is also working on repurposing FDA approved drugs to block SARS-CoV-2 infection in humans.
17. Dr. Rajkumara (BT dept.) is working on in silico engineering of putative epitope peptides from proteins of SARS-CoV-2 on nanoparticles to develop vaccine candidates.
18. Dr. Mudrika Khandelwal (MSME dept.) and Ashish Misra (BT dept.) are developing Pulmonary delivery of antiviral herbal oils for adjuvant therapy.
19. Dr. Thenmalarchelvi (BT dept.) is identifying potential drug targets in the structural proteins of SARS-Cov-2.
20. Dr. Jyotsnendu Giri (BME) is working on a peptide-based vaccine for SARS-Cov-2.

V. Sensors/ Detection and Air Purifiers:

21. Dr. Shiv Govind Singh (EE dept.) is developing rapid, ultrasensitive biomolecule sensor for detecting coronavirus in individuals.
22. Nemocare and Heamac, two startups of CfHE, mentored by Dr. Renu John (BME dept.) are working on wearables for COVID-19 patient monitoring in isolation wards without having to go near to the patient unless there is an emergency. Nemocare Raksha is a wireless wearable for monitoring COVID-19 patients. This device is for COVID-19 patients in the ICU segment and home care segment. The device is ready to be manufactured on a large scale.

23. Dr. Ashudeb Dutta, Dr. Gajendranath Chowdhary and Dr. Soumya Jana (EE dept.) are developing an "A Handheld Contact-less Temperature Recording Device" for measuring the temperature for advanced fever screening in the COVID-19 pandemic.
24. Kvayat Medical, a start up from CfHE, under the mentorship of Dr. Renu John (BME dept.) has developed a product "Traqaro", which enables organised tracking and monitoring of COVID-19 patients with the help of a Bluetooth-based wearable.
25. Heamac Solutions, a start-up from CfHE, under the mentorship of Dr. Renu John (BME dept.) has developed A Tracker to diagnose & prevent COVID-19 spread with the help of a wrist band to detect symptoms of COVID-19 infection, screening & support.
26. Dr. Jyotsnendu Giri and Dr. Hari Krishnan (BME dept.) are working on rapid, affordable, portable SARS-Cov-2 screening kit.
27. Dr. Ch. Subrahmanyam (CHY dept.) and Dr. Shashidhar (CE dept.) are working on Air purifiers that can help residents, hospitals and malls to purify air contaminated with viruses.
28. Dr. Chandrasekhar (CHE dept.) and Dr. Anindya Roy (BT dept.) are developing a nano biosensor for rapid and early detection of SARS-CoV-2.
29. Dr. Lopamudra Giri and Dr. Suahanya (CHE Dept.) have started designing a 3D printed device that can be used for the detection of multiple proteins by using immunoassay for SARS-CoV-2 infection diagnosis and severity categorization.
30. Prof. Zafar Ali Khan (EE dept.) is working on Real-time detection of COVID-19.

VI. Apps and Software:

31. Dr. Harish Dixit (MAE dept.) is building a cough simulator to test the efficacy of masks and this work is being carried out based on discussions with colleagues at IIT Bombay, TIFR Mumbai and ICTS Bangalore.
32. Dr. Rajalakshmi (EE dept.) is working on IoT enabled remote monitoring of temperature and respiratory rate for COVID-19 infected patients.
33. Dr. Mohan Raghavan and Dr. Kousik Sarathy (BME dept.) have been working on Data analysis and modelling of COVID-19 disease spread.
34. Dr. Krishna Mohan (CSE dept) is leading a team to work on using visual surveillance to detect social distancing & people wearing masks.
35. Dr. Vineeth (AI dept.) and his team are working on AI to explain decisions on detecting Coivd-19 using chest X-ray.
36. Dr. Kishalay Mitra (CHE dept.) is working on deep learning based cost-effective and rapid prognosis of COVID-19 to aid the state-of-the-art PCR & serology-based diagnosis in India.
37. Dr. Kishalay Mitra and Lopamudra Giri (CHE dept.) are working on development of computational and visualization software for evaluating GPCR targeting drugs with the aim of mitigating coronavirus infection level.
38. Mr. Shubham Panchal (CS18BTECH11052), Mr. Rishik Ramena (CS18MTECH11018), Ms. Sneha Ghadiya (CS18MTECH11003) and Mr. Supreet Singh (CS16BTECH11038) developed and deployed a portal for helping Sangareddy distt administration in door delivery of essential items during lockdown (May/June 2020).

VII. Other Areas:

39. Dr. Digvijay Pawar and Dr. Pritha Chatterjee (CE dept.) are modelling the Impact of COVID-19 outbreak on the daily commute and vehicular emissions during the transition phase.
40. Dr. Mahati and Dr. Haripriya (LA dept.) are working on exploring working mothers' experiences, regarding housework, childcare and professional work during the lockdown through regular interviews.
41. Dr. Satya Prakash Singh (Maths Dept.) is working on A cost-effective approach to the design and analysis of multiple experimental groups: a useful methodology for comparing potential treatments for COVID-19.
42. Dr. Shuhita Bhattacharjee (LA) is working on "Urban Patterns of Gendered 'Productivity,' Emotional Abuse, and Anxiety during COVID-19."
43. Dr. Prabheesh (LA dept.) is working on the impact of COVID-19 on financial markets.
44. Dr. Shiva Ji (Design Dept.) is working on "Design for the New World: Post COVID-19: A Disruptive Change in Context".
45. Dr. Ambika (CE dept) is working on the Impact of COVID-19 on Environmental Sustainability.
46. Dr. Sathya Peri and Dr. Vineeth have initiated work on Effective Framework for Managing supply and demand post lockdown using Federated Learning.
47. Prof. Zafar Ali Khan (EE dept.) has developed a non-intrusive, passive method using LTE signals for monitoring Crowd size for detecting social distancing violations.
48. Dr. Srikar A V R is working on "Touchless design solutions kit", "Readiness plan for re-entry into workplaces in compliance with WHO/CDC/Government norms", "Distributed working styles: Work-from anywhere solutions" and "Ergonomic/ Postural analysis while working from home".

VIII. Publications on COVID-19 related topics:

49. Dr. Surendra Nath, Seismic Noise Changes during COVID-19 pandemic: A case study of Shillong, India, Natural Hazards.
Dr. Aalok Khandekar (LA Dept) is working as part of an international research project examining how COVID has complicated efforts aimed at managing effects of extreme heat among low-income residents in Hyderabad.
Publication: Nausheen Anwar, Sulfikar Amir, Jamie Cross, Daniel Friedrich, Aalok Khandekar, Marie Morelle, Elspeth Oppermann and Anindrya Nastiti. "Heat and Covid in the Off-Grid City." Somatosphere. July 2, 2020.
http://somatosphere.net/2020/heat-covid-off-grid.html/
50. S. Sardar, A. K. Mishra and M. Z. A. Khan, "Crowd Size using CommSense Instrument for COVID-19 Echo Period," in IEEE Consumer Electronics Magazine, doi: 10.1109/MCE.2020.3032791.
51. Dr. M. V. Panduranga Rao and Mr.Rajesh Kumar Pandey (CS15RESCH11008) have a relevant paper "Traveling Agents and Indirect Epidemic Transmission" in the 15th

Agent Based and Multi-Agent Systems: Technologies and Applications (KES-AMSTA-21) conference.

52. Dr. Kirti Sahu, Dr. Saravanan Balusamy and Dr. Sayak Banerjee estimated the lifetime of potentially covid containing droplets on various surfaces (like glass, paper or smartphone cover) at various humidities and temperature conditions with implications on sanitization frequency of public and home spaces.
Publication: "Lifetime of sessile saliva droplets in the context of SARS-CoV-2", Balusamy S., Banerjee S., Sahu K. C., International Communications in Heat and Mass Transfer 123 (2021) 105178.

The 4th Edition of IITH Newsletter (किरIITH) on Harbouring Healthcare @IITH also talks about the steps that can be taken to prevent the spread of COVID-19. The 4th Edition of किरIITH may be downloaded from the link provided below:
https://pcr.iith.ac.in/Kiriith-Issue-4,October,2020-Harbouring-Healthcare@IITH.pdf

Also, on the social front, IITH has supported local administration with PPEs and distribution of sanitizer. IITH has even ensured the safety of the surrounding villages which have been adopted under "Unnat Bharat Abhiyan" (UBA) by creating awareness on the malignant implication of COVID-19 spread and how to avoid its transmission.

This is for your kind information.

Yours sincerely,

(Cmde. Manohar Nambiar (Retd.))
Registrar, IIT Hyderabad.