INTRODUCTION

Looking back at our campus, we see empty roads, deserted night canteens, vacant grounds, locked cycles in their sheds, and complete silence. IIT Kharagpur has never been so pale since its very foundation. We all want to come back to KGP, revive the old days we left behind, and fulfill the plans we made throughout the lockdown. We want to live our college days to the fullest and fill IIT KGP's air with our echoes.

WHY DO WE NEED TO OPEN THE CAMPUS?

After our institute shut its gates in March 2020, the mode of education was shifted from offline to online. With the new normal, it was a more challenging task for KGP than any other sister IITs, considering its geographical location, medical facilities, and other resource limitations. At present, the institute is still operating in a fully online mode. Most of the academic work is conducted online, and non-academic work is reduced to minimize social contact.

The reasons to open the campus are endless. We are facing most of the troubles at first-hand and have heard about the rest -

- This can be seen with the number of posts and confessions we see on a daily basis on various social media.
- Many students are crippled with resources and don't have a good working environment in their homes.
- Due to very limited interactions, people are constantly in a state of depression, and cases leading to mental health damage , suicidal tendencies are increasing.
- Due to the lack of a good internet connection and limited resources, many students are unable to sit for internships and placements.
- Some students have little to no faith in the online evaluation process which can affect their ambitious career paths.
- One can get to see the pathetic condition of students by going through the reports produced by student media bodies.

Coming to the major concern regarding the opening of campus, the biggest fear is the risk for life. But science tells us a different story altogether !!

Based on the CDC's "Provisional COVID-19 Death Counts" vs. "2018 CDC Leading Causes of Death" - For an American, age 65-74 is...

1. 4 times more likely to die of COVID than an accident
2. 3 times more likely to die of COVID than diabetes

But, for an American, age 15-24 is...

1. 21 times more likely to die in an accident than COVID
2. 11 times more likely to die by suicide than COVID
3. 8 times more likely to die by homicide than COVID
4. 2.5 times more likely to die by cancer (Malignant neoplasm) than COVID

5. 1.5 times more likely to die by heart disease than COVID

Coming to an Indian Context -
Based on an article published by The Hindustan Times on 19th December 2020,

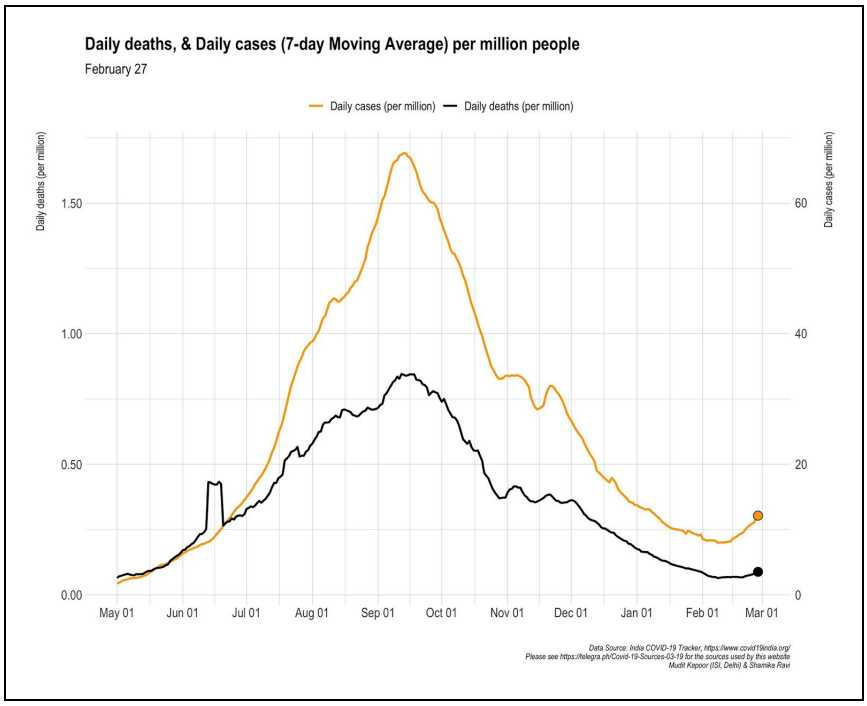
1. 88% of the people who lost their lives due to covid-19 in India till December 16 were above 45, but only 40% of total reported infections fall in that group.
2. People under the age of 45 years accounted for 60% of all Covid-19 infections in the country but constituted only 12% of total deaths
3. At least 70% of the deaths were in patients with at least one or more underlying medical conditions such as hypertension, diabetes, cardiac/kidney/liver related diseases.
4. India's cumulative case fatality rate (CFR), which is the percentage of patients who died among those having tested positive, currently stands at 1.45%, which is far lower than the global CFR of 2.26%.

Talking about stats published by The Times of India in one of its article, the percentage of total covid-19 deaths in India as of 30th Dec 2020 is as follows :

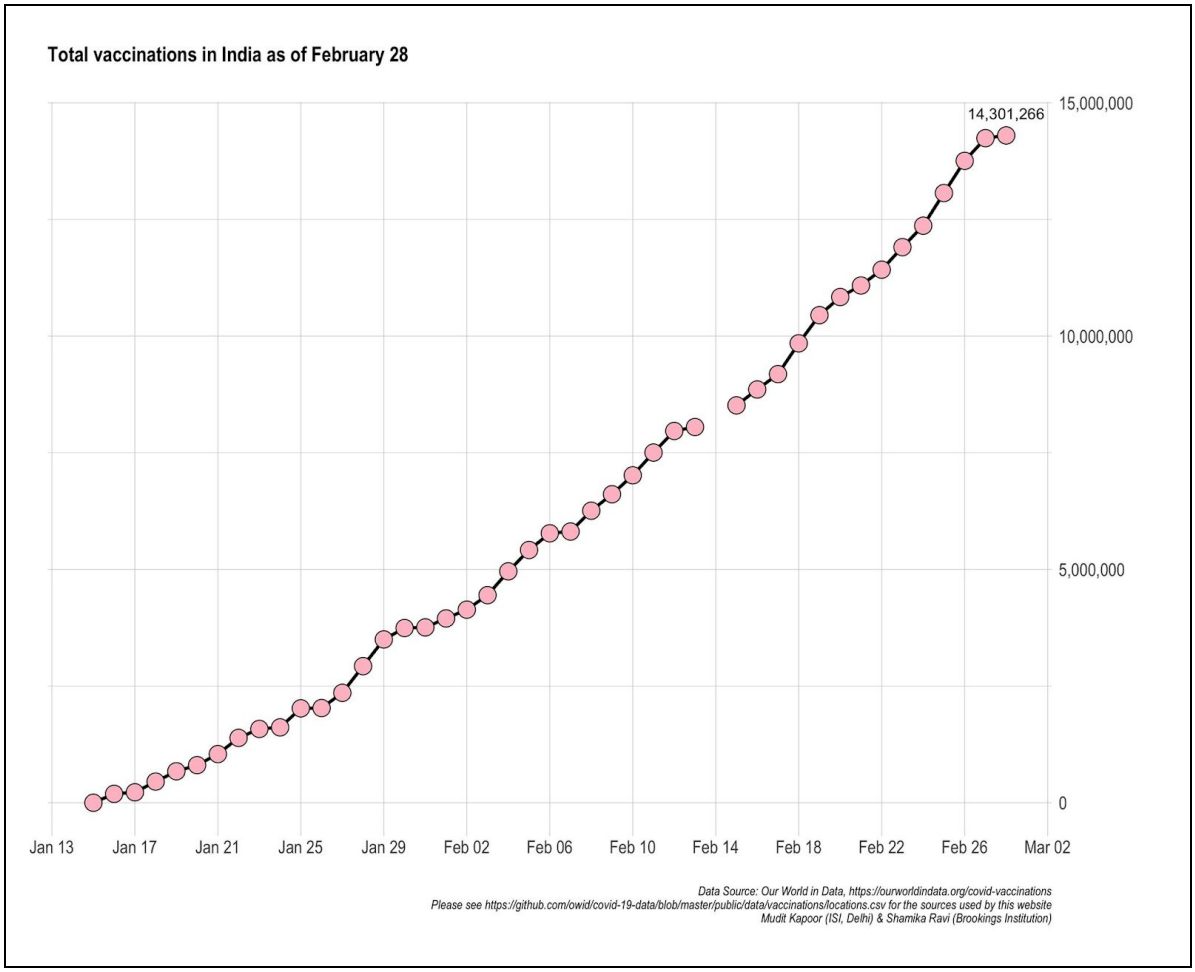
1. Age group less than 17 years - 1%
2. Age group between 18-25 years - 1%
3. Age group between 26-44 years - 10%
4. Age group between 45-60 years - 33%
5. Age group above than 60 years - 55%

According to the Google Covid Dashboard -

1. The current death rate is 1.41%
2. The current recovery date is 97.07%
3. The trend of daily deaths and daily cases since May is provided below -



4. The following plot shows the regular increase in the number of vaccinations -



According to this article published in European Journal of Epidemiology, the estimated age-specific infection fatality rate is very low for children and younger adults (0.002% at age 10 and 0.01% at age 25) but increases progressively to 0.4% at age 55, 1.4% at age 65, 4.6% at age 75, and 15% at age 85.

Also, there are various other research papers and articles published by renowned publications and journals, which give more and more evidence for lowest mortality rates in the younger population.. According to an article published by The Economic Times, Road accident scenarios are 'more serious' in India than COVID-19 with 415 deaths daily. This is further supported by the article published by The Indian Express, which concludes that the impact of Covid-19 deaths is expected to be far less than road injuries in India

As the students between the ages of 18-30 form the majority of stakeholders of the institute, The scientific evidence produced so far tells us that we should be ready to open the campus (*but with necessary precautions)*.

WHY TO PARTICIPATE and WHAT TO DO?

IITians across the world are known for their phenomenal problem-solving skills. Today, in this unexpected situation, you are given a platform to showcase these skills and are asked to come up with a foolproof plan to change your very own circumstances. **We need a solid plan to open the campus and we shouldn't panic for the same.** This case study aims for a policy that can accomplish our aim, and may also set an example for our sister institutes .

The main aim of this Case study is to reflect the need of the hour and to finalize a detailed plan with the collaboration of our vast student community. We encourage participants to look out for new ideas to serve the purpose along with their feasibility.

Many institutes across the world have already opened their campuses, in Autumn 2020, with all precautions. Universities like Purdue, Cornell, and many US universities were running in hybrid mode in Autumn 2020 but have now decided to shift to a complete offline framework with their regular schedules in the coming semesters. As the world is moving on, we should also adapt. Your major work will lie in replicating the efforts of these universities in an Indian setting with a major focus on cost optimization. Phase wise return is not a feasible solution without hampering our academics. Assuming 300 students are called every week, it will take about 40 weeks to welcome the complete student population back on the campus!

Purdue opened in Autumn 2020 with pre-arrival testing and they planned to keep the cases low by random surveillance of 10-15% of the total students' population and around 200 staff members (who were critical to the operations of the university) every week. Cornell is another such university that went a step ahead in Autumn 2020 with pre-arrival testing as well as pooled post-arrival testing. In order to keep the numbers low, they tested every student on campus every week. Their decision making is all based on mathematical models, of which the modeling technique and codes are publicly available.

The Cornell model is the most detailed model one could find for now, which completely studies the virus spread, calculates optimistic, nominal, and pessimistic estimates of cases in students, faculty, and staff over a 16 week semester. It also estimates required quarantine facilities over time. Hence, you may start from here on your mathematical modeling for our campus. The difficulty may be there in terms of data available on Covid situations inside/outside the campus, but valid assumptions can always work with proper justification.

Coming back to the Indian context, you may have heard of some cases where the consequences of opening campuses were catastrophic . There was an outbreak on IITM campus in December and the campus was placed under strict lockdown. But, going into detail, you will find out the campus was put under lockdown at around 50 cases out of 750 students. But Science has given evidence not to panic! Purdue and Cornell have kept their campuses open despite having thousands and hundreds of cases respectively during Autumn 2020. No fatalities were recorded and they have opened back again for Spring 2021.

Participants may visit the dashboards of Purdue, and Cornell, which can be of big help in their plan. Participants may also get some insights into “safe” levels of COVID within the campus by looking at these dashboards.

Hence, it can be observed from all the above facts that the opening is indeed possible with a good plan. People have done it around the world and now it’s our turn to do so. This is the need of the hour as online education is not at all a substitute to in-person education and it adds no value to the fee we pay and the taxpayer’s money that is spent on us.

CONSTRAINT IN THE OPENING

1. Due to its geographical location, various limitations are there for Kharagpur including lack of good medical facilities, testing lab, quarantine centers, etc.
2. The medical facility on campus is not sufficient considering the vast population of campus and a few positive cases may cause unnecessary panic. .
3. Lack of facilities for quarantine inside the campus: As per the government guidelines, quarantine should be done in rooms with attached bathrooms. This is practically impossible considering the architecture of halls we have.
4. A limited number of support staff to monitor the whole process.

PROBLEM STATEMENT

IITKGP has a large student community comprising students from different parts of the country and different family backgrounds. But net facilities are not adequate everywhere and for everyone. On-campus learning has its own merits (lab research/practical), and students of IITKGP must not be deprived of it for long. Hence, we are calling all KGP students for brain-boosting and serving our “home away from home” during this crisis.

We invite everyone to present plans to mitigate and administer the Coronavirus outbreak and its implications in the process of normal functioning. The main motive of this case study is to present an idea on “How to open IIT KGP ?” with a proper balanced functioning of various activities inside the campus.

Participants are advised to Identify the current trend, analyze the behavior, and compare it with other universities on how the impact of this virus can be minimized in the process of opening the campus. Your solution will be judged on the basis of your innovative ideas and their achievability including cost, risk factors, and other medical aspects. Detailed calculations and estimations should be added to support your ideas.

WHAT IS EXPECTED FROM THE PARTICIPANTS

The main aim of problems listed below is to propose a detailed plan to run the campus from Autumn’21 in the best possible way as it was before the pandemic i.e. full-fledged reopening.

***Disclaimer: All contestants must bear in mind that the decisions taken by the administration are final and binding. The outcome of this study is in no way reflective of the re-opening of the campus**.*

We expect the participants to answer the following questions precisely with relevant statistics, data, computation and references supporting their solutions -

1. State the rules and regulations pertaining to the safety and hygiene of the students, faculty, and staff in a complete offline academic session. Details should include all the academic and non academic aspects of the campus. [50]

2. As of now, there are many cheap and effective methods developed for testing. Using these techniques, our aim is to identify students for quarantine before they enter the campus. How do you facilitate such arrangements? You are required to propose a model for pre-arrival testing of Covid before students arrive on campus. And also explain a simultaneous model for post-arrival testing before we allow students to go to halls. [30]

3. Due to the budget constraint, testing everyone in our vast community (like Cornell) is not feasible on a daily basis. How do you plan to execute random testing for students, faculty, staff, and other campus communities during Autumn'21? What percentage of the population would you like to test every week ? Give mathematical evidence. [20]

4. What kind of innovation do you plan to bring in to minimize the risk of spreading of the virus during possible super spreader events like short lunch hours, crowd in buses, rush in bicycle paths, and main roads. Suggestions may include stretched timetables, longer lunch hours, etc. Also, what will be the new sitting guidelines in classrooms? [20]

5. How do you plan to implement the sanitation process at different places like halls, academic areas, and community areas? Describe the plan including how to enforce them in detail. Suggestions may include increased frequency of cleaning washrooms by maintenance staff , wiping of desks, tables, and chairs at regular intervals by maintenance staff or by students themselves while leaving the classrooms etc. [20]

6. To minimize the interactions, is there any need for the modification of existing rules to enter academic complexes, hall premises, roam around wings, use hall facilities, commute on campus roads, etc. Suggestions may include formulations of new code of conduct or modification of existing guidelines. (For example - putting on a mask all the time except while in a mess, social distancing etc.) [20]

7. There are various courses across disciplines (like EVS, BS, Breadth subjects etc.) that don't require offline presence. Dropping-off such courses or continuing with the online classes, what option would you choose? Based on that, give a revised curriculum that the students would follow across disciplines for the upcoming semester to reduce the number of student-to-student interactions in academic complexes. [20]

8. The senior faculty can be considered more vulnerable to the effects of the virus as compared to others. How do you ensure their safety? Will you shift their classes online or is it possible to provide them with a more protective environment inside the class? [10]

9. A number of PG and RS students visit the campus as day scholars. They are prone to higher contact and transmission as they are in daily contact with the external community of Kharagpur. How would you incorporate day scholars in your solution? [10]

10. The space in labs is limited and hence, social distancing is difficult to follow. Design an efficient way of lab scheduling and space utilization for research for PG and RS students to minimize transmission in lab facilities. Clearly mention the modalites along with the person responsible for the same. Suggest any other change you would like to make to uplift the existing procedure. Suggestions may include change in policy for biometric attendance, CRF, CIC labs, etc . (It is advised to consult Research Scholars to know their trouble and propose solution for the same) [40]

11. Describe the set of rules which will be useful to handle the violations of the afore proposed (anywhere in answers to questions from 1 to 10) guidelines. Clearly mention all the punishments, Disciplinary actions , etc. [20]

12. Identify people who are critical for university operations, like the mess and maintenance staff, and sketch a plan on how to protect them. How would you accommodate government protocols in your plan if the maintenance staff are vaccinated under the union govt's direction to vaccinate sanitary staff? Study the timelines and describe both scenarios. [20]

13. Shopkeepers of Tech Market form a large population who are again at high risk of external contact and susceptible to exposure. TechM was operating under restrictions during the Junta Curfew and post Junta Curfew. Provide a model for the functioning of the Tech Market. Mention the steps you would take to make the execution better. [20]

14. For the functioning of the campus, proper functioning of mess on a large scale will be a bigger challenge. Because it makes lots of suppliers move in and out of the campus. How do you plan to minimize the risk? Suggestions may include procuring dry ingredients at once, changes in the menu, etc. [10]

15. There will be daily traffic due to the swimming pool, gym, various school children, their parents , etc inside IIT Kharagpur Campus. How will you tackle this traffic in order to minimize the risk? [20]

16. There are many small businesses in each hall, which fulfill the daily needs of many students. Would you allow such small businesses in halls to open? If yes, how do you plan to do it? If not, why do you want the businesses in halls to be shut? [10]

17. What all extra-curricular activities do you plan to allow on campus? Provide limitations of Interhall General Championship and open IIT activities. State the precautions that need to be taken for the same. Can implementation of government guidelines with respect to sports activities be possible inside the campus? [20]

18. Considering our vast student community and the campus population, it is likely to have some positive cases inside the campus. What steps will you take if a student is tested positive? How would you perform contact tracing? Where will you quarantine them and how would you deal with the people who came in contact with the infected person? [20]

19. In the scenario that the campus reopens in the near future, what is your detailed plan to complete labs that are currently incomplete, given the virtual semester ? How do you plan to deal with academic challenges like missing lab classes that the students in isolation/quarantine will face? What new policies can be of help? [20]

20. A new batch of first-year students will join us from next semester. Can you suggest any new innovations in the first-year curriculum? For example - If someone decides not to go for a department change, then what's the need of him/her taking the full 45 credit year? Keeping this in mind, give a reduced first-year curriculum. Give a mathematical model for assessing the impact of how many interactions can be reduced in large classrooms in such a reduced curriculum setting . [20]

21. There will be instances wherein people might have to travel outside the campus due to various reasons like Internships, visiting home, personal emergencies, etc. How do you plan to accommodate such cases? [20]

22. If you give winter vacation, people are bound to travel back. If this is the case, you will need to do the complete exercise of testing again post their arrival (hopefully for Spring'22). Is it cost and time-worthy to give a vacation? Or do you plan to start the spring semester early and end it early? [20]

23. Keeping the health facilities at campus and their capacity to cater to COVID +ve patients in mind, if for some reason, the case count of covid-19 patients increases dramatically inside the campus, what action plan do you suggest along with the threshold that will trigger those plans. [20]

24. Nominate your dream team (faculty + students + staff) to implement the exercise of opening the campus and keeping it open. Clearly define the hierarchy, assign job roles, responsibilities, powers, etc. [20]

Participants are encouraged to provide any further relevant proposals that will help us deal with the crisis and create a new, and better learning environment for all the students on campus.

COST ESTIMATION AND FEASIBILITY

1. Estimate the total cost for your proposed plan. Total cost should include the expense at every step of the proposal i.e. Testing, quarantine services, surveillance, contact tracing, etc. Mention suitable assumptions for charges involved (like ward charges for quarantine) and any suitable covid related hospitalization expenses. [70]

2. It would be rather inhumane to ask the current faculty, staff, and managers to do all this extra work for keeping the institute open.. You will need a team of additional workers/ contractual staff to do most of the jobs as identified in the questions & in your proposals.. List them and mention suitable agencies that can provide these services. Estimate how much extra amount would be needed for the same [40]

3. Assuming the Institute has a limited budget and may not be able to incur all these additional expenses *(estimated by you in above 2 questions)*. Tell other ways to finance the same (like loans from banks) and how will KGP pay it back? Like a charge on students over some years or grants from alumni or in what ways? [40]

RULES AND REGULATION

1. Any student affiliated with IIT Kharagpur can be a part of the team. To cover all the aspects of the plan, it is advised to make a team comprising students of each domain i.e. UG, PG, and RS.
2. A team can consist of 2 to 30 members.
3. The event will be conducted in two phases: 1. Online submission of report 2. Final presentation by shortlisted teams [via Online Mode].
4. Report making rules
    a. Report should be mailed in A4 size page layout in .pdf only. Arial font should be used for text with a minimum font size of 11. Also, single line spacing should be followed.
    b. Overall, the report should not exceed 50 pages. For each extra page, 5% marks would be deducted. It should contain -
        i. Title - 1 page only
        ii. Index - 1+ page
        iii. Report Content - 45(Max) page.
        iv. Annexure and relevant statistics - 11(Max) page - In the first page of annexure nothing should be written except “Annexure”.
        v. Watermark, header, footer can be added anywhere in the report including title pages.

vi. The report should be supported with valid references wherever needed.

5. Shortlisted teams from the report submission round will have to present their ideas in the form of PowerPoint presentations to the judges.
6. The final evaluation by judge(s) will be on the basis of both the Presentation and the Submitted Report.
7. Team Leaders should fill the form to make the submissions for the first phase on or before **31st March 2021, 11:59 PM.**
8. All the teams are requested to provide the **names, roll numbers, contact details, and Email IDs** of each member of their team in separate pdf along with the report file in .zip format.
9. Details of the second phase will be mailed to the above listed emails and mobile numbers.
10. The decision of the judges would be final and binding.

CRITERIA OF EVALUATION

1. Detailed Plan + mathematical modeling - 500 points
   (Points for each question is given along with the questions)
2. Cost Estimation and feasibility - 150 points
3. PowerPoint Presentation (details to be mailed to shortlisted teams) 200 points

CONTACT US

Rushi Patel
+91-9494181101
ruttuc2000@gmail.com

Mayank Priyadarshi
+91-9065878399
priyadarshimayank41@gmail.com

RELEVANT DATA

ALL THE INFORMATION IN THIS DOCUMENT IS ASSUMED FOR THE PURPOSE OF CASE STUDY AND MAY NOT BE TRUE. HENCE, THIS DOCUMENT SHOULD NOT BE TREATED AS ANY OFFICIAL DOCUMENT FROM IIT KGP ADMINISTRATION SIDE.

1. Number of teaching staff - You can visit IIT KGP website for exact details
2. Number of non-teaching staff - You can visit iit kgp website for exact details
3. Number of Mess and maintenance staff - 600 + 400 respectively
4. Number of Security guards - 350 (50 in crucial position) - They work in 3 shifts i.e. about 120 guards per shift.
5. Number of shops in Tech market - 135
6. Number of rooms/boarders in each hall - http://www.hmc.iitkgp.ac.in/web/halls/
7. Number of available classrooms in Nalanda - 64
    a. 100 capacity* - 32
    b. 200 capacity* - 16
    c. 300 capacity* - 16
8. Number of available classrooms in Main building - 15
    a. 200 capacity* - 5
    b. 100 capacity* - 10
9. Number of available classrooms in every department - 2
    a. 50 capacity* each
10. Number of available classrooms in Vikramshila Complex - 4
    a. 400 capacity* - 2
    b. 200 capacity* - 2
11. Number of available classrooms in JCB Complex - 4
    a. 100 capacity* each
12. Number of buses - 6
    a. 45 capacity* each
13. Latest academic calender - http://www.iitkgp.ac.in/files/acad_cal2021_all.pdf
14. Capacity of BC Roy
    a. Beds - 30
    b. Isolation ward - 2
    c. Doctors - 15
    d. Nurses - 15
    e. Ambulance - 3
15. Number of testing centers in nearby IIT campus - 2 (30 per day for each of the testing center). You are advised to not limit your proposal by this value. You can consider changes in this data for your plan but make sure you account for all the costs concerning the same.
16. Current opening guideline and statistics of some other institutes -
    a. IITB - Click Here
    b. IITR - Click Here
    c. IITK - Click Here

d. IIMA - Click Here
e. IISC - Click Here

17. For reference to guidelines for cleanliness, mask policy, etc, you can follow the UGC guidelines

*: Without enforcing social distancing

Any other suitable data can be assumed, with proper justification, if needed.