

**Report on Online Kaizen 2020**  
**Chemical Engineering Department**  
**L. D. College of Engineering-Ahmedabad**

**1. Brief Description of the event:**

The online Kaizen 2020 for Chemical Engineering Department was conducted with 4 panels of faculties reviewing all the teams of final year IDP/UDP projects on dated 3<sup>rd</sup> April, 2020 through Zoom meeting app. Total 13 faculty members had reviewed 15 teams (total 71 students) as per the schedule given below:

<b>Panel No.</b>	<b>Name of the Faculty panel</b>	<b>Students group</b>	<b>Guide</b>	<b>Time slot</b>
1.	Dr. Sachin P. Parikh Dr. Satish R.Shah Prof. T.S.Rajaraman Prof. Vandana Gojiya	Bhupendra & Group	Dr. Sachin P. Parikh	11:00 am to 11:20 am
		Riddhi & Group	Dr. Satish R.Shah	11:20 am to 11:40 am
		Tejas & Group	Prof. T.S.Rajaraman	11:40am to 12:00 Pm
		Brijesh & Group	Prof. Vandana Gojiya	12:00 pm to 12:20 pm
2.	Prof C.G.Bhagchandani Prof. Rajul P. Bhatt Prof. Pratik B. Patel	Dhaval & Group	Prof C.G.Bhagchandani	11:00 am to 11:20 am
		Yogesh & Team	Prof. Rajul P. Bhatt	11:20 am to 11:40 am
		Jaydeep & group	Prof. Pratik B. Patel	11:40am to 12:00 Pm
		Viral & Group	Dr. Sachin P. Parikh	12:00 pm to 12:20 pm
3.	Prof. S.M.Dutta Prof. Hiral Pandya Prof. Nikita Ambegaonkar	Harsh Singh & Group	Prof. S.M.Dutta	11:00 am to 11:20 am
		Harsh Panchal & Group	Prof. Hiral Pandya	11:20 am to 11:40 am
		Tanvir & Group	Prof. Nikita Ambegaonkar	11:40am to 12:00 Pm
		Jaymeen & Group	Dr. Satish R.Shah	12:00 pm to 12:20 pm
4.	Prof. Amar Vaghela Prof. Ronak Patel Prof. Rupal Ruperi	Meru & Group	Prof. Amar Vaghela	11:00 am to 11:20 am
		Hemang & Group	Prof. Ronak Patel	11:20 am to 11:40 am
		Dixit & Group	Prof. Rupal Ruperi	11:40am to 12:00 Pm

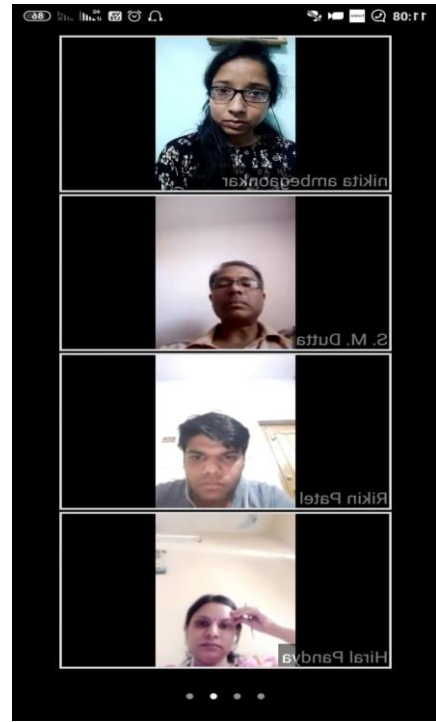
Group NO.	Group Members	Enrolment Number	Topic of the project (Name as per PMMS account entry)	Name of Guide	Type of Project
1	Paris Bhupendra.	160280105029	Mitigation of Wax in oil pipeline	Dr. Sachin Parikh	UDP
	Patel Renish	160280105039			
	Harshvardhan Mori	160280105059			
	Kaushal Parmar	170283105009			
	Pankaj Lilapara	160280105019			
2	Riddhi Darji	160280105012	Manufacturing Aspects of Beta-naphthol	Dr.S.R. SHAH	IDP
	Pomal Pranjali	160280105047			
	Soni Mansi	160280105052			
	Gadara Nikunj	160280105013			
3	Rana Tejas J	170283105015	Photo-catalytic degradation of organic pollutant	Prof.T.S Rajaraman	UDP
	vasava anush A	170283105018			
	Bhupendra patel	170283105012			
	Patel ankit	170283105011			
	vasava rahul	120280105059			
4	Malani Brijesh	160280105022	Removal of Cr (VI) From Waste Water By Using Activated Carbon made From Banana Peels	Prof. Vandana Gojiya	UDP
	Maniya Rumit	160280105024			
	Vasani Chintan	160280105056			
	Kateshiya Kishan	170283105004			
	Prajapati Rohit	170283105014			
5	Chavda Nebha k.	160280105009	Desulphurization processes and recovery of sulphur from crude oil	Prof. C.G.Bhagchandani	UDP
	Barad Hitendra	160280105003			
	Dabhi Dashrath	160280105010			
	Kamani Romin	160280105017			
	Kanjariya Dhaval	160280105018			
6	Yogesh Kuriya	170283105005	Green synthesis of linear alkylbenzenes by Diels–Alder cycloaddition	Prof. Rajul Bhutt	UDP
	Akhil Panchal	170283105007			
	Darshan gohil	170283105003			
	Hetal Parmar	170283105008			
	Nilesh Parmar	170283105010			
7	Chaudhari Utpal	160280105008	Extraction of natural dyes	Prof. Pratik Patel	UDP
	Rathava Mayank	140280105025			
	Gamit Parth	150280105013			
	Bhagora Jaydeep	160280105004			
	Vasava Bhavin	160280105057			
8	Bhuva Sanket	160280105005	Bio-lubricant from vegetable oil.	DR. SACHIN PARIKH	UDP
	Anghan Viral	160280105002			
	Jivani Hardik	160280105015			
	Kakadiya Raj	160280105016			
	Paghadal Sagar	160280105026			

9	Harshkumar singh	160280105051	Efficiency improvement of sour water stripper (sws) reboiler in ethylene production	Prof. Supritam M Dutta	IDP
	Alan George	160280105001			
	Kshitij Patel	160280105038			
	Rikin Patel	160280105040			
10	Harsh Panchal	160280105027	Synthesis of biodiesel using nano particles.	Prof. H N PANDYA	UDP
	Param Parekh	160280105028			
	Viral Shah	160280105050			
	Parth Tanna	160280105054			
11	Prajapati Dhanraj	160280105048	Recovery of Metals from Industrial Waste	Prof. Nikita Ambegaonkar	UDP
	Tanvir ahmed Dadi	160280105011			
	Preet Shah	170283105016			
	Tushar Madhani	160280105020			
12	Patel Rutvik	160280105043	Manufacturing aspects of h-acid	Dr.S. R. SHAH	IDP
	Makavana Jaimeen c.	160280105021			
	Patel Brijesh Lalbhai	160280105033			
	Patel Shukan	160280105044			
	Patel Sumit Himmatbhai	160280105045			
13	Vadher Harshadkumar D.	160280105055	Energy saving around distillation column by Efficient process modification.	Prof.A.N.Vaghe la	UDP
	Raghavani Merubhai	160280105049			
	Parmar Darshan	160280105030			
	Odedara Jaymal	160280105025			
	Pathar Ketan	160280105046			
14	Hemang Patel	160280105034	Production of Hydrogen using Solar Thermochemical Cycle	Prof.R. R. PATEL	UDP
	Surabhi Champaneri	160280105006			
	Ketul Patel	160280105037			
	Riya Patel	160280105041			
	Zarna Surati	160280105053			
15	Ketan Patel	160280105036	Industrial wastewater treatment using cstr	PROF. RUPAL RUPERI	UDP
	Ganvit Dixit	160280105014			
	Bhavik Patel	160280105032			
	Hitesh Patel	160280105035			
	Ketan Patel	160280105036			

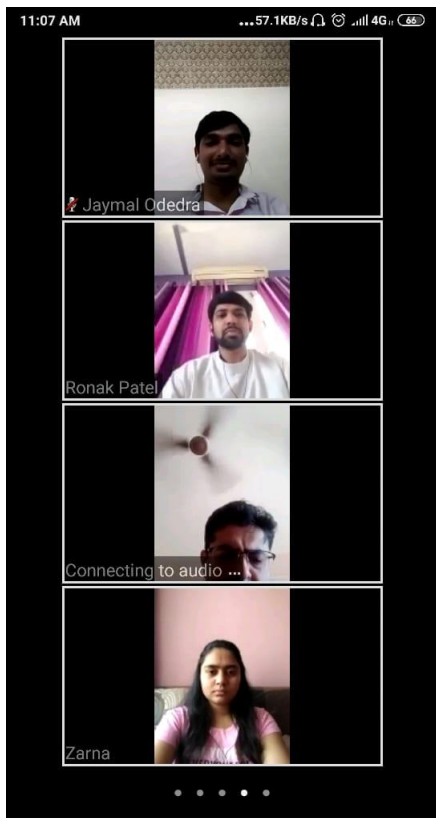
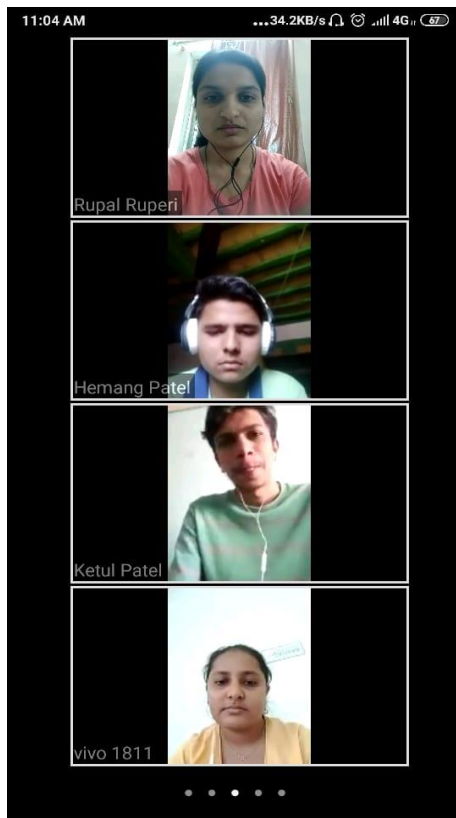
**Here are some screenshots of the online kaizen 2020 through Zoom Meeting app.**

Panel No.	Screenshot of faculty and students group	
Panel 1.	 <p>A screenshot of a Zoom meeting grid showing four participants in a vertical column. From top to bottom: Sachin Parikh (a man with glasses in a blue shirt), Pranjali (a woman in a blue shirt), Mansi Soni (a woman in a blue shirt), and RIDDHI DARJI (a woman in a black shirt). The time is 11:20 AM and the battery is at 42%.</p>	 <p>A screenshot of a Zoom meeting grid showing four participants in a vertical column. From top to bottom: Satish Shah (a man with glasses in a blue shirt), Rohit Prajapati (a man in a light blue shirt), Brijesh Malani (a man with glasses in a red and white shirt), and Kishan kateshiya (a man in a white shirt). The time is 11:37 and the battery is at 40%.</p>
Panel 2	 <p>A screenshot of a Zoom meeting grid showing four participants in a vertical column. From top to bottom: pratik patel (a man in a blue shirt), Rajul Bhatt (a woman in a white headscarf), Utpal Chaudhari (a man in a red shirt), and CG Bhagchandani (a man in a white shirt). The time is 12:13 and the battery is at 34%.</p>	 <p>A screenshot of a Zoom meeting grid showing four participants in a vertical column. From top to bottom: pratik patel (a man in a blue shirt), Kamini Romini (a woman in a blue shirt), Rajul Bhatt (a woman in a white headscarf), and Hiren Kumar Bared (a man with glasses in a maroon shirt). The time is 11:32 and the battery is at 21%.</p>

Panel 3



Panel 4



## 2. Brief Detail of innovative projects having good industry/societal impact

(1) Name of project: Sour Water Stripper (SWS) Reboiler performance Improvement

Objective: This project is a part of Hot Section of Refinery off Gas Cracker (ROGC) of C2 complex of RIL, Jamnagar. Due to ineffective oil-water separation pre-filters, filters and coalescer weren't able to work properly and due to polymerization, tar and coking fouling occurs in reboiler of SWS as time passes. The approach of solution is by design considerations for which we used HTRI and MS Excel softwares to analyze run – length.

Important outcomes:

- introducing a pump at a bottom of reboiler which maintain the certain velocity to avoid fouling (Converting thermosiphon reboiler to forced flow reboiler)
- Plug ~10% to ~15% of total tubes so that velocity of tubeside fluid be maintained high to avoid fouling. This will improve the run – length of reboiler which will reduce the operating cost as well as improve and maintain the sour water quality.

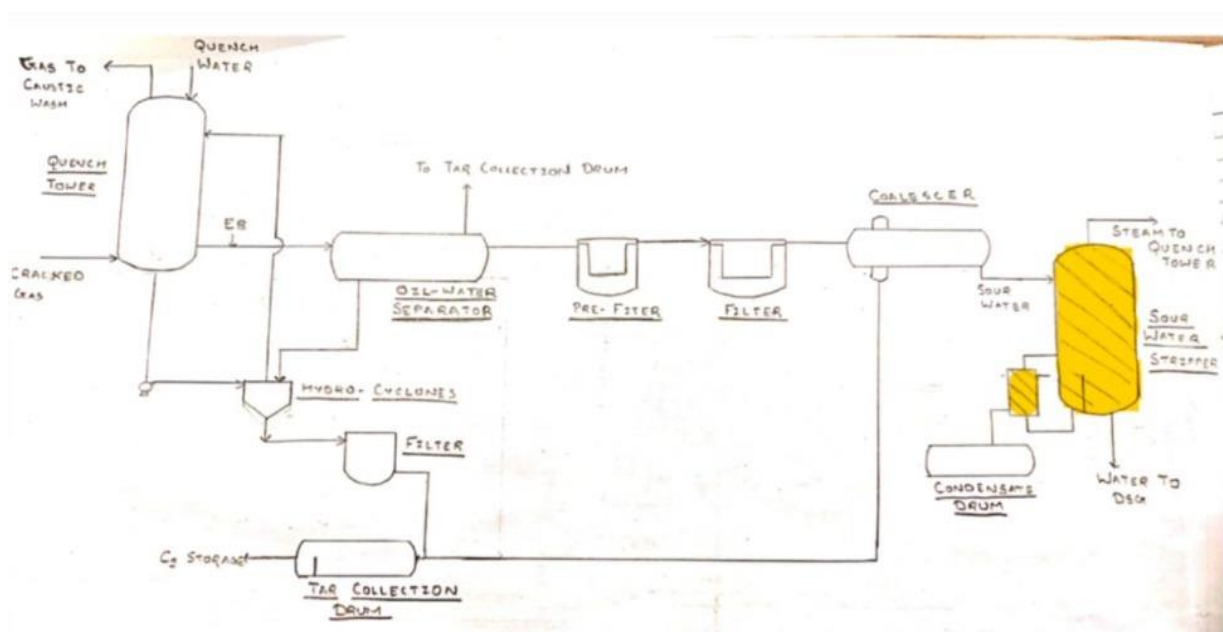
Team members:

1. Singh Harshkumar(160280105051)
2. Alan George(160280105001)
3. Patel Kshitij(160280105038)
4. Patel Rikin(160280105040)

Guided by:

Prof. S. M. Dutta  
Associate professor  
Chemical Engg Dept-L.D.C.E.

Photos of the projects



HTRI Xchanger Suite v7.10 - [xist - input] - Sour water stripper reboiler\_rev1 - input summary

File Edit View Input Tools Window Help

MKH

Input Summary

Process

Hot Fluid Properties

Cold Fluid Properties

Geometry

Exchanger

Thermosiphon Reboiler

Piping

Inlet Piping

Outlet Piping

Tubes

Baffles

Nozzles

Tube Layout

Optional

Design

Control

Input Notifications

HTRI

Type N E N Orientation Vertical Item No. Connected in 1 parallel 1 series

Hot fluid Shellside Unit angle

PERFORMANCE OF ONE UNIT

Fluid allocation		Shell Side	Tube Side
Fluid name		LP steam	Sour water
Fluid quantity, Total	1000-kg/hr	15.5	
Temperature (In/Out)	C	146	111.8
Vapor weight fraction (In/Out)		1	0
Inlet pressure	kgf/cm2A	4.133	1.553
Pressure drop, allow	kgf/cm2		
Fouling resistance (min)	m2-hr-C/kcal	1e-4	6e-4
Heat exchanged	MM kcal/hr		

CONSTRUCTION OF ONE SHELL

		Shell Side	Tube Side
Design/Test pressure	kgf/cm2G	8.1	6.3
Design temperature	C	260	260
Number passes per shell		1	1
Corrosion allowance	mm	3.175	3.175
Connection			
Size	mm	1 @ 247	1 @ 247
Out	mm	1 @ 146	1 @ 480
Rating	Intermediate		

Sketch (Bundle/Nozzle Orientation)

Tube No. OD 25.4 mm Thk(avg) 2.53 mm Length 4500 mm Pitch 31.75 mm

Tube type Plain Material Carbon steel Tube pattern 30

Shell Carbon steel ID 1160 OD 1185.4 mm Shell cover

Channel or bonnet Channel cover

Tubesheet-stationary Tubesheet-floating

Floating head cover Imp. Prot. Yes Rods

Baffles-cross Type Single segmental %Cut 45 Spacing(c/c) 500 Inlet mm

Orientation Perpendicular Crosspasses Outlet mm

Baffles-long

Supports-tube Seal type

  U-bend Type

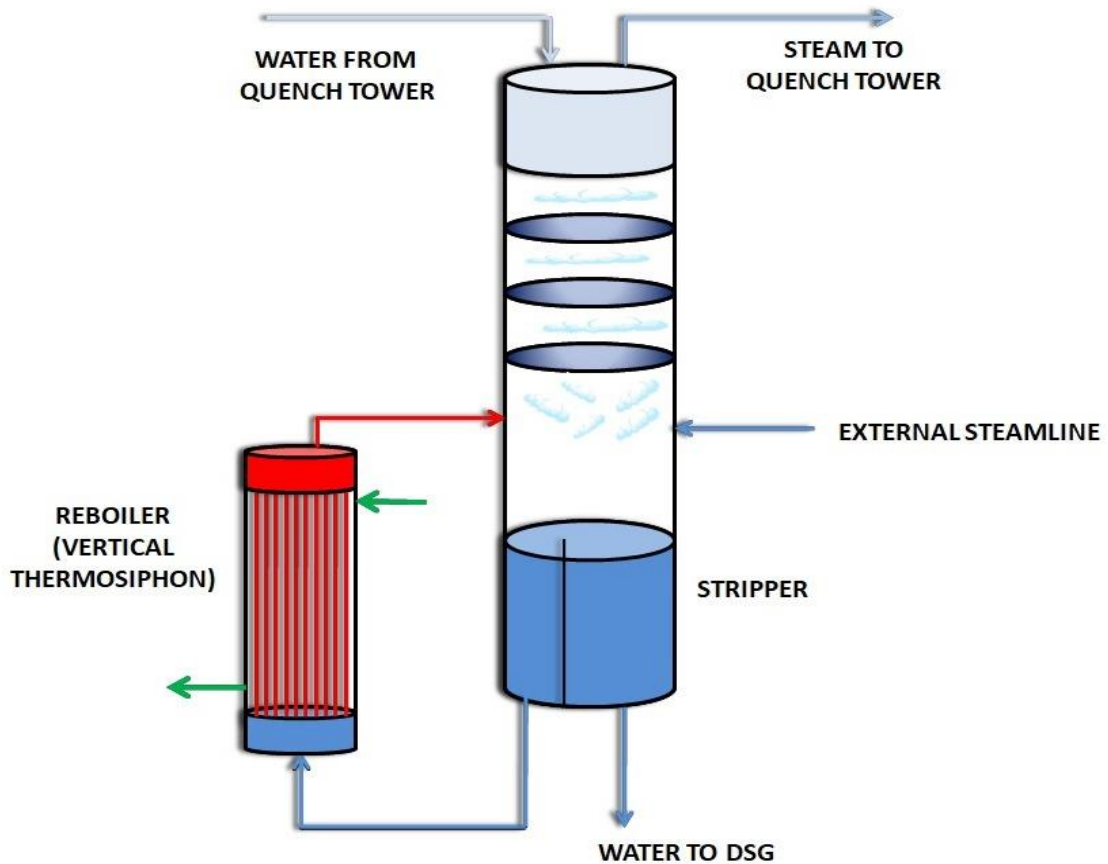
Bypass seal Program Set pairs strips Tube-tubesheet joint Expanded (No groove)

Expanding joint

Input Remarks

Input Reports Graphs Drawings Shells-in-Series Design Session

For Help, press F1



(2) Name of project: Synthesis of biodiesel using nano particles

Objective: Biodiesel is a renewable energy source that is potential alternate of the petrol-based diesel. Biodiesel is environment friendly and also have other advantages over petrol based diesel. For the synthesis of biodiesel we can use either homogenous or heterogeneous catalysts. Currently most of the industries are using homogenous catalyst. But the problem with a homogenous catalyst is that separation cost of catalyst from final product by water washing and then distillation is costly and more energy consuming. Also the FFA content should be between 0.1%-0.5%. On the other hand heterogeneous catalyst eliminates these limitations by simply filtration. A further advantage with the nano catalyst is that it provides more surface area, higher selectivity and stability.

Important outcomes:

In our project nano catalyst are synthesized using co precipitation procedure. Using transesterification process biodiesel is synthesized. We are mostly using non edible oil as a feedstock oil. From the results of our projects, we can conclude that production of biodiesel using nanocatalyst is on a cheaper side but the yield can be improved. Research is also going on for the same. Our project has been selected for SSIP grant in July-2018..

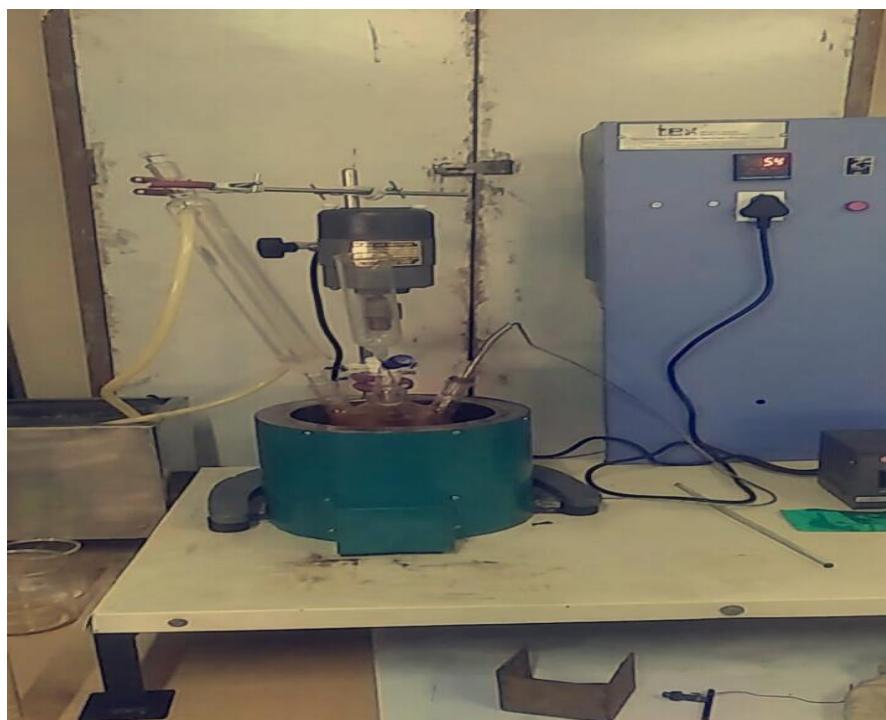
Team members:

1. Panchal Harsh (160280105027)
2. Parekh Param (160280105028)
3. Shah Viral (160280105050)
4. Tanna Parth (160280105054)

Guided by:

Prof. Hiral Pandya  
Assistant professor  
Chemical Engg Dept-L.D.C.E.

Photos of the project:







(3) Name of project: Removal of Cr (VI) From Waste Water by Using Activated Carbon Made from Banana Peels

Objective: Chromium (+6) one of the heavy metal with many health hazards as well as a severe pollutant. One of the methods used for removing chromium (VI) is by using activated carbon. One of the most effective and economic method for making activated carbon from agricultural waste is from banana peels. From various studies

Important outcomes:

It is found that preparation of activated carbon from grafted banana peels give 96% adsorption of Cr (VI)). We also observed the effect of increasing contact time of activated carbon and effect of increasing adsorbent dosage and noted the results of the same. Adsorbents can be successfully used for removing of chromium (VI) ions from wastewater. The maximum adsorption percentages of Cr (VI) ions using both adsorbents were achieved within 120 minute. The adsorption percentages of Cr+6 ions increased sharply by increasing adsorbent dose. This process will directly reduce cost of industrial/ municipal waste water treatment and many of environmental issues will reduce to significant level.

Team members:

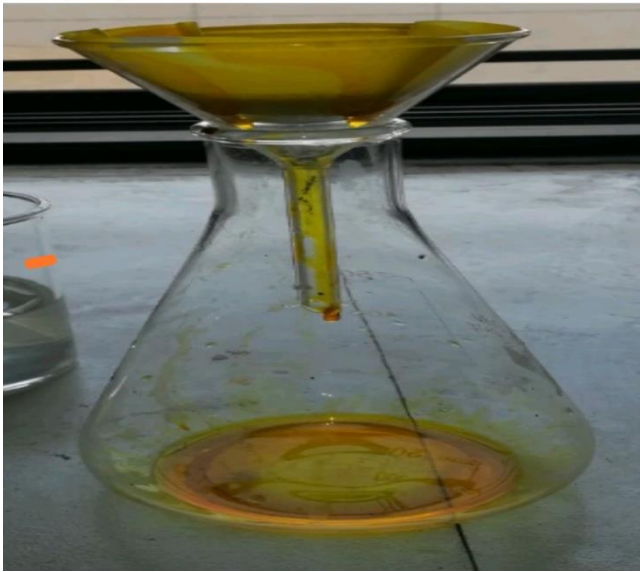
1. Malani Brijesh (160280105052)
2. Maniya Rumit (160280105024)
3. Vasani Chintan (160280105056)
4. Kateshiya Kishan (170283105004)
5. Prapati Rohit((170283105014)

Guided by:

Prof. Vandana Gojiya  
Assistant professor  
Chemical Engg Dept-L.D.C.E.

Photos of the project:





### **3. Feedback**

#### **(A) Feedback from the faculty members:**

- (1.) The recently concluded online Kaizen project presentation was an innovative approach of online teaching-learning technique. The students had a wonderful time for getting an opportunity for being evaluated by various learned reviewers. All the students felt fortunate of motivational and inspirational comments from all referees. The future scope for exploring their projects as an innovative project and chance of getting assistance under various start-up and innovative schemes of government was discussed in detail. It was a wonderful initiative and should be utilised regularly in teaching learning process.

From:

**Prof. C. G. Bhagchandani**

**Associate professor**

**Chemical Engineering Department-LDCE**

- (2.) Students were appreciated for the project work by panel members. Students were also advised to carry out detailed cost analysis. Students were asked to find competitive technologies and suggest advantage/drawback of their proposed technology. Besides technical solution, students were motivated to improve communication skills. They found this review to be thought provoking. Constructive suggestions obtained from panel members found to improve overall quality of project work.

From:

**Prof. Ronak R. Patel**

**Assistant professor**

**Chemical Engineering Department-LDCE**

#### **(B) Feedback from the students**

- (1.) I would like share my experience about the presentation of the project.

*Enthusiasm:* It was an overall great experience to present a project with our guide and faculty.

*Queries:* The presentation was well arranged that all team was solving their queries for the project.

*Suggestion:* I would like to add no suggestions regarding the presentation because it was pretty good for our team.

From:

**Sanket Bhuva (160280105005)**

(2.) It was really great experience to learn from the faculties though at the distance we all took part in that particular activity. All of our queries is being resolved by faculties. However activities I personally think that activities like poster making is not legit. Instead of that we could try to do some more work on that. We should also be concerned about our technical knowledge. We can try group discussions or interactive quiz or problem solving competition so that we keep brushing up our knowledge.

From

**Hemang Patel (160280105034)**

(3.) *Enthusiasm:* we were excited for new ideas and desire to become involved with faculties.

*Queries:* Some questions arise but at the same time .They concern for us and solve maximum doubts.

*Concerns:* I appreciate and feeling fortunate to have these kinds of faculties, they are very polite and helpful.

*Suggestions:* suggestions which they give us were become another path of the project to look forward and be clear at all the level.

From:

**Dhanraj Prajapati (160280105048)**

(4.) *Enthusiasm:* Till now students were eager to join these video conferences to get information and to continue their work.

*Concerns:* Sometimes time limit of 35 minutes becomes the problem. Required internet speed is above average for good communication. At the same time internet consumption is also high. Technical glitches in sound and audio.

From:

**Shah Viral J.(160280105050)**

(5.) *Enthusiasm:* The project undertaken was IDP so we are excited that we are going to learn and understand about how work is to be done in professional world.

*Queries and concerns:* During project exact issues with the system and Past year Data gathering was a bit tedious process.

*Suggestion :*The suggestion and guidance obtained are very helpful and path deciders at some points.

From:

**Kshitij Patel (160280105038)**

#### **4. Best practice for evaluation of projects in chemical department**

Chemical engineering department had organized mid sem internal review for BE Final Year (8th Sem) projects for expert review on their work progress so that their work directions can be more focus and detailed rectifications can be given for improvement of their work. This review also helping students to be ready for their final external presentation for GTU in such a way that their soft skills and confidence is improved to higher level. This review also suggests the team ability to perform the project work so team members can synchronize with each other while presenting. It is true that a person learn from his own mistake, so the review also provides them a platform to avoid any mistake they might make even in future. The object of a project review is to help the team achieve the project goal and do their best.

The following best practice was followed by chemical engineering department for all the projects by each faculty of the department:

##### **(A) Mentoring of students on pitching, presenting and demonstrating their project effectively.**

In chemical engineering department, we mentored the students in such a good way that, they gave their best presentation during this online kaizen 2020. Our each faculty member regularly review his/her project under his/her guidance. We organized one project internal review for final year students on 13<sup>th</sup> March, 2020. After the project internal review the students were given the correction and suggestion for betterment of their final year project. Here are some photographs of the inter review of the project of the final year students held in chemical engineering department.





(1) Guidance of creating effective presentations

- This is a sequential step-by-step process, a list of the main action points for creating and preparing a successful and effective presentation, large or small. The process includes preparing, creating, checking, rehearsing, refining and finalizing the presentation.
- Clearly identify your area of project and objective.
- Think about interesting ways to convey and illustrate.
- Use brainstorming and mind-mapping methods.
- When you have a rough draft of your presentation you should practise it.
- You must create a strong introduction and a strong close.
- Refine your presentation, taking account of the feedback you receive from your friends and guide and your own judgment. Test the presentation again if there are major changes, and repeat this cycle of refinement and testing until you are satisfied.

(2) Tips and techniques for successfully delivering presentations

- Preparation and knowledge of the project is the pre-requisites for a successful presentation, which importantly produce confidence.
- Depth of conviction counts more than height of logic, and enthusiasm is worth more than knowledge.
- Research and studies generally indicate that positive impact and good impression, so make sure you have a good, strong, solid introduction, and rehearse it.
- Break up the content so that no single item takes longer than a few minutes, and between each item try to inject something remarkable picture, a quote.
- Here are examples of the many elements students can add to a presentation: Pictures, diagrams, Surveys and statistics, Examples and case-study references.

(3) Explanations and methods for reducing presentation fears and stresses

- The cause of fear is lack of confidence, lack of control or a feeling of not having control over the situation, other people and our own reactions and feelings and in some cases possibly a bad memory or experience from our past.
- The two big causal factors low confidence and control stem typically from inadequate preparation/rehearsal and low experience of technology of chemical engineering. Presentations which do not work well usually do so because they have not been properly prepared and rehearsed.
- So, in our chemical engineering department had organized internal review which will help the students to come out of the fears and stress. Faculties continuous guides and motivates the students so that they confidently communication and can present the idea of their projects.