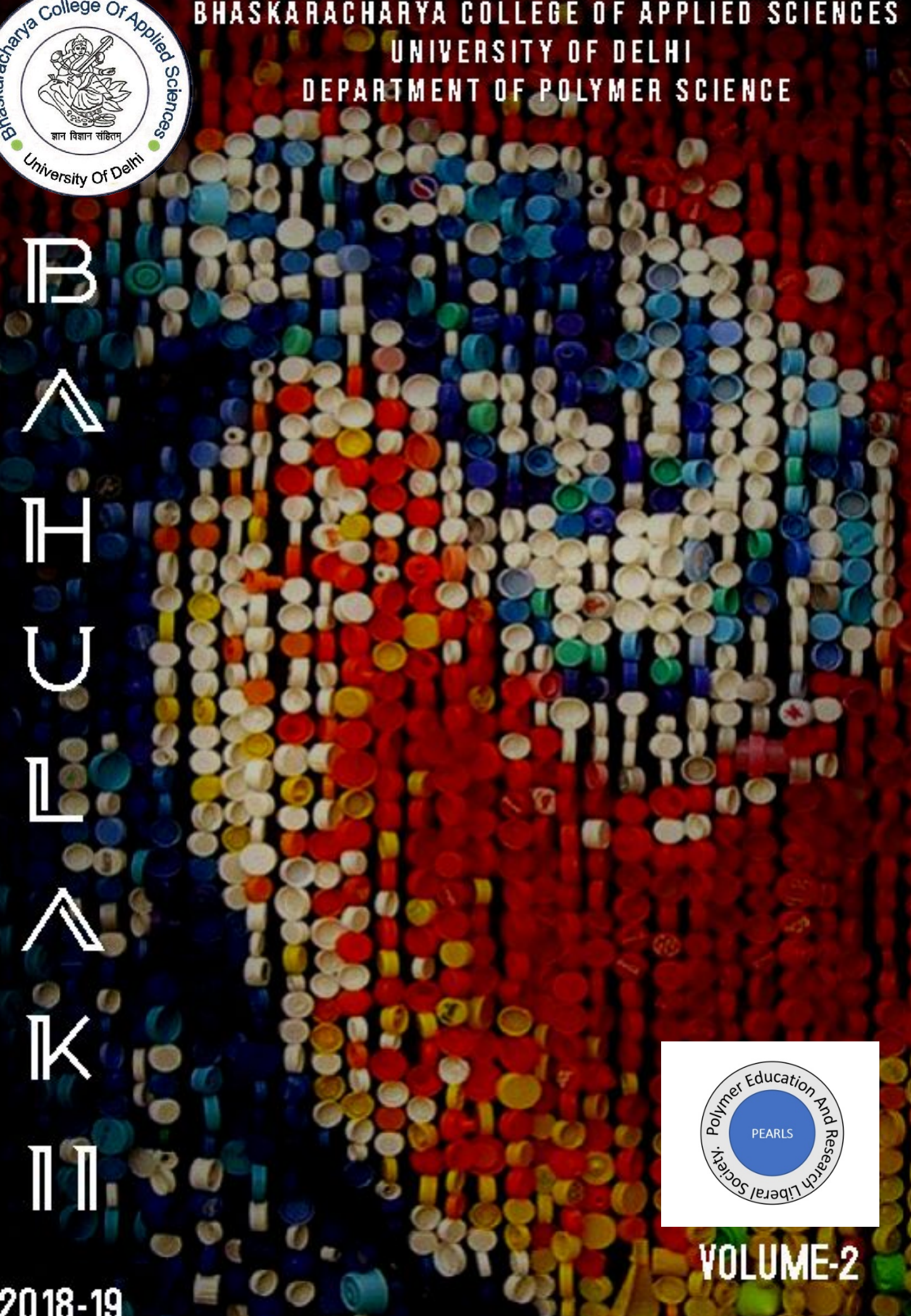
BHASKARACHARYA COLLEGE OF APPLIED SCIENCES
UNIVERSITY OF DELHI
DEPARTMENT OF POLYMER SCIENCE

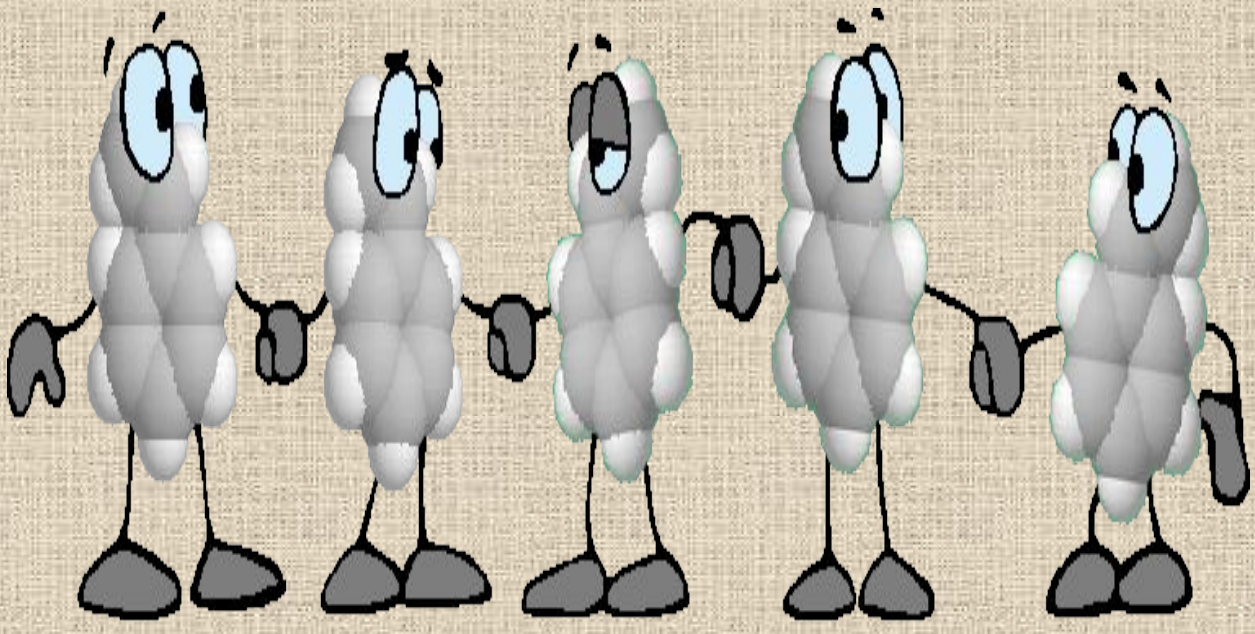


BHUTLAKI

Polymer Education And Research Liberal Society
PEARLS

VOLUME-2

2018-19


Monomer
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Polymer

I would like to congratulate the Polymer Science Department on the successful release of the second edition of its Annual Departmental Magazine "Bahulak". The editorial team have put in great efforts. Since the inception of the department of polymer science in year 2004, department has been contributing immensely in the endeavour of Bhaskaracharya College of Applied Sciences, a strong belief that education is not an act of acquiring knowledge but learning a skill to lead life and forming one's personality. This is an ennobling process of growth. I can boldly say that we have excelled in every initiative that we undertook and we have stood together in facing the challenges in realizing skilled and quality education. The department has well qualified faculty members who are consistently striving for the upliftment of the students by engaging them in innovation and scientific research life along with extracurricular activities.

Dr. Balram Pani
(Principal)

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MESSAGE FROM

We feel privileged at the release of the second issue of departmental magazine "BAHULAK". The magazine showcases activities of Department of Polymer Science such as Industrial visits, Academic programs and Socio-Academic events, Seminars etc. organized during 2019-20. The Magazine has also gives a platform to students to showcase their breathtaking hidden literary talent.

The Department acknowledges the efforts of students, members of departmental society *PEARLS* and editorial team along with sincere gratitude to Dr. Balaram Pani, Principal for valuable inputs and suggestions. We also offer sincere thanks to Department of Textile Technology IIT Delhi, Institute of Tool Engineering Delhi, University Science Instrumentation Centre, University of Delhi and others Agencies for extending their support to students and faculties of the department.

Dr. Sidhharth Sirohi
(Teacher In-charge)

About the Department

The department of polymer science came into existence during 2004. The polymer science program intends to impart basic knowledge of Polymer Science, processing, testing and its applications to the students. The Department has well equipped laboratories with various latest and sophisticated instruments to meet the requirement of the experiments up to the mark of industrial standards and to train the students with synthesis, processing and testing of polymers.

Department of Polymer Science has developed a blog “http://polybcas.blogspot.in” to share the relevant information of Departmental events/activities, which is linked to the college website and being administered by the department. The students can also give their feedback and alumni can share the experience through this platform in effective and easier way.

EDITORIAL NOTE

Greetings to all,

In an endeavour to bring out the hidden talent of the students, faculties and staff of the Department of Polymer Science, BCAS; the Polymer Science society “PEARLS” has brought the departmental magazine “BAHULAK” for the first time. This magazine has tried to capture the different colors of the polymer world and the moments of your journey in this department.

“BAHULAK” is a results of immense effort of the editorial board to compile the vivid colors of the talent, achievements and the memories of the **monomers of this polymer Department.** We thank all the students and staff members without whose support, the outcome might have not been so interesting. We also thank the Principal of the college Dr. Balaram Pani and the Teacher-in-charge of Polymer Science Department, Dr. S. K. Shukla for giving us the opportunity to work relentlessly to come up with something like “BAHULAK”.

We hope all of you will cherish and enjoy this journey.

Dr. Susmita Dey Sadhu

Coordinator, Editorial Team

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Mr. Rajendra Singh
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Mr. Sumit
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EVENTS & VISITS

INDUSTRIAL TALK AND RELEASE OF BAHULK VOLUME-1

PEARLS Society of Department of Polymer Science organized Industrial Talk titled “The Plastic Industry-Unfolded” on October 29, 2018 in which eminent speakers from various industries (Mr. Varun Gupta, Technical head, Pluss Polymers; Mr. Vinod Fotedar, Director, Elephant energy Pvt. Ltd. ; Mr. Kailash Pandey, Business Development Manager, Shriram axiall) were present. The guests introduced students with various industrial aspects of polymer and further career options

Mr. Sachin Kumar Prajapati (B.Sc. (H) 3 rd Year Polymer Science Student) manufactured an aeroplane model in association with Mr. Abhishek Bhatnagar, Director, R. S. Bhatnagar & sons (Alumni, Department of Polymer Science) during his summer internship in the period June 06, 2018 to July 19, 2018 and was donated to Bhaskaracharya College of Applied Sciences on October 29, 2018.

Department of Polymer Science released Departmental Magazine “BAHULAK” Vol. 1, 2017-18 on the same day.


P.A.SYSTEM

CROSSLINK

The Polymer Science Department of Bhaskaracharya College of Applied Sciences organized its departmental fest "CROSSLINK" on 21 st January,2019. The most colorful and memorable day for the department turned out to be a grand success. The event was held whole day long. It included lecture from Dr. R.C. Sharma, fun games, some indoor activities such as MARVEL quiz, Pictionary, and a few outdoor events such as badminton matches and Lagori (pitthu).

Fest was commenced by the welcoming of the chief guest, followed by the lightening of lamp, accompanied with melodious Saraswati Vandana, hailing the goddess of knowledge and wisdom. The function was inaugurated by our Principal Dr. Balaram Pani. Dr. S.K Shukla, Teacher-in-charge of Polymer Science Department welcomed the guest and introduced the activities and the department. Then saplings were presented to the invited guests, marking their warm welcome to the prestigious occasion.

Dr. R.C. Sharma pumped up students with motivation through his lecture that everyone enjoyed. After the long lecture, fun games and activities like quiz, Pictionary were initiated, alongside other outdoor activities like badminton matches were held in the badminton courts. Students from other departments also took part in the games having a whale of time. A delicious lunch was served, filling everyone's pit.

Finally event was concluded by vote of thanks by the President of PEARLS, Mr. Sandeep Tripathi .


Prof. R.C. Sharma


Shot on OnePlus
Powered by Dual Camera

NATIONAL AND INTERNATIONAL CONFERENCES

Students visited along with faculty members at the International Conference on "Polymer Waste Management" on September 28, 2018 at India Habitat Centre.

Ms. Neema Kushwaha, Ms. Nidhi Bijalwan and Mr. Shantanu Pandey, students of B.Sc. (H) Polymer Science III rd Year received the "Best Poster Award" at the National Conference on New Trends in Nanotechnology and Application" held on September 27-28, 2018; ARSD College, New Delhi. The award was given for research work titled "Preparation and mechanical properties of Vegetable oil based polymer and PVA blend" done by above students under guidance of Dr.Susmita Dey Sadhu and Dr. Prem Lata Meena.

Juhi Gupta, Sunil Choudhary students of Bsc.(H) Polymer Science III rd under the guidance of Dr. Prem Lata Meena were awarded for having the Best Poster in the two day National Conference on "Clean And Green Energy: The Chemical and Environmental Aspects" held on 26-27th Sept,2019 at Bhaskaracharya College Of Applied Sciences

DELHI INSTITUTE OF TOOL ENGINEERING VISIT

On 14th of February,2019 the Department of Polymer science of Bhaskaracharya College of Applied Sciences organized a visit to the Delhi Institute of Tool Engineering (DITE), located in Wazirpur, Industrial area, Delhi. The visit aimed familiarizing students with the process of mold designing application. The group of students was led by Dr. Saroj Kumar Shukla and Dr. Anil Barak.

Several mold making tools were introduced. The first one being Lathe machine. The Lathe machine rotates the workpiece about an axis of rotation to perform various operations such as cutting, sanding, knurling, drilling, deforming, facing and turning, to create an object with symmetry about that axis.

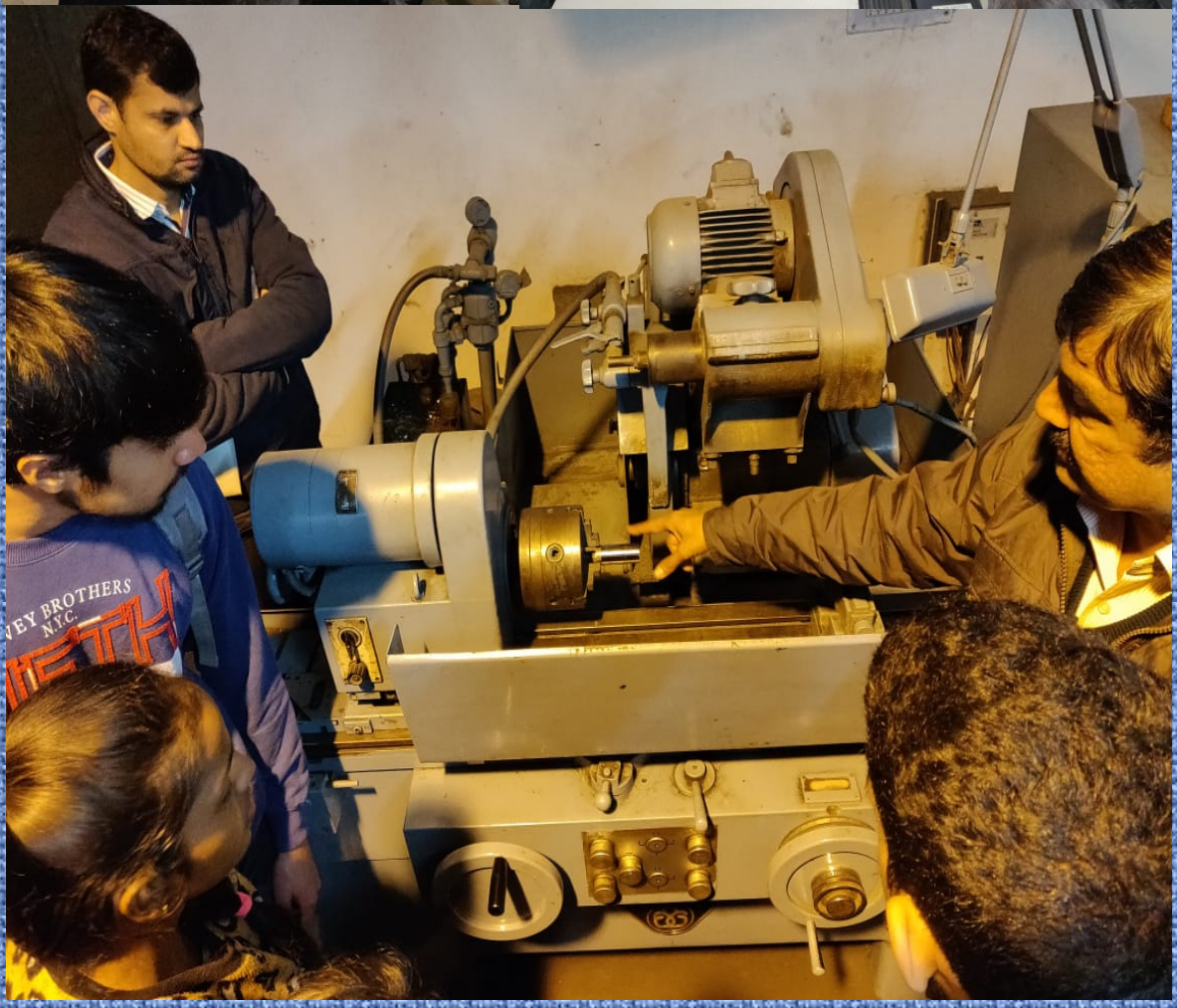
The next was a milling machine, used to remove the material from the workpiece using rotary cutters which can move up-down, front-back, diagonally as well as sideways. Next up was the surface grinding machine.

Then students were familiarized with the Electric discharge machine (EDM) which according to the instructor is used to obtain a desired shape by using electrical discharges (sparks) the material is removed from the work piece by a series of rapidly recurring current discharges between two electrodes, separated by a dielectric liquid and subject to an electric voltage.

An industrial class injection molding machine also caught everyone's eye. The unit although similar to the one we have at our college. But was comparatively larger and had more intricate settings to produce the desired result.

The session proved to be a fruitful experience for the students who now acquired some practical knowledge behind the principles of mold design. Students were provided with some refreshments at the end.


FANUC


BROTHERS
N.Y.C.

FAREWELL

Farewell party for the 3rd year students of polymer science department of Bhaskaracharya College of Applied Sciences was successfully held on 13th April ,2019.

It was a big day for the 3rd year students since they had so many emotions and memories attached with the college, which were in their eyes on this special day of them. The complete arrangements for the party were done by 2nd year students followed by help from 1year students and combined they made it a day worth remembering. The day started with the entry of the third year students. They were warmly welcomed by their juniors and this was followed by application of tikka or a holy mark on their forehead and they walked through the corridor passage with flowers showering on them. This gave a nice start to the programme. The function started with greeting words of Dr. Balaram Pani, Principal and Dr. S.K Shukla, Teacher-in-charge. Their speech included warm wishes for the 3rd year students. A dance performance was then presented by the girls of 2nd year which filled the crowd with energy and enthusiasm. This energy increased when the next programme i.e., title distribution.

The audience enjoyed this a lot. The function also included a boy's dance performance which was entertaining and full of comedy and the audience laughed a lot. This was followed by playing of a video which included the moments spend by the 3 year students in their college span of 3 year in form of photos. This was something which made the 3 year students emotional since they had their whole journey in front of their eyes.

The function ended here with good vibes in the environment and a smile on the faces of 3 year students since they had a wonderful day. They thanked the 2nd year students for such great arrangements and the day ended with happiness and positivity.

The best wishes to the students were also expressed by Dr. Sidhharth Sirohi, Dr. Susmita D. Sadhu, Dr. Krishna Dutt, Dr. Anil Barak, Dr. Prem Lata Meena, Dr. Pradeep Kumar and Dr. Umesh.


farewell 2k19


FAREWELL
2k19

UNIVERSITY SCIENCE INSTRUMENTATION CENTER VISIT

A visit to university science instrumental center (USIC, University of Delhi) was organized by the society on September 6, 2018 for the 3 rd year students along with faculty members Dr. Anil Barak and Dr. Saroj Kumar Shukla. University Science Instrumentation center (USIC) is a central testing facility and houses sophisticated analytical instruments. Facilities for carrying out spectral, thermal, chemical and microstructural analysis on a variety of materials are extended to all researchers.

We were introduced to a no. of instruments namely Bruker High resolution X-ray diffractometer, Perkin Elmer FTIR spectrometer with ATR & Specular reflectance, Thermal analysis Perkin Elmer TGA, DTA and DSC Jeol 400 MHz Nuclear Magnetic resonance, Jeol scanning electron Microscope (SEM) with EDS, FEI High Resolution Transmission electron microscope (TEM) CHNSO Analyzer, Liquid nitrogen (LN2) storage tank and distribution facility, Jeol Electron Spin resonance (ESR) spectrometer, Single crystal X-ray diffractometer. We were guided by the research scholars and laboratory staff who gave a brief introduction about the working of the instruments and their applications

The visit was organized in the favor of students so that they could learn and gain practical knowledge about the instruments that are not available in the polymer science laboratory and increase their spectrum of understanding behind working of instruments.

POLYMER RECYCLING VISIT, NIDHI ENTERPRISES

On 21st February, 2019, the Department of Polymer Science of Bhaskaracharya College of Applied Sciences organized a polymer recycling visit to Nidhi Enterprises, located in Bawana, New Delhi. The main aim of the visit is to provide the students practical knowledge about the polymer recycling and the steps and units involved in recycling.

The students were accompanied by Dr. Sushmita Dey Sahoo, Dr. Anil Barak, Dr. Prem Lata. A bus was arranged for the same from the college. On reaching the site, we saw a large amount landfills in that particular area which may be consumer's waste from different parts of Delhi. The students were then taken to a place were sorting of plastic waste is done. The workers were manually arranging plastic waste into 5 different sections (HDPE, PP, LLDPE, PET, PP). The were arranging them by recognizing their material, flexibility, brittleness etc. the waste is then sorted according to color composition and after them there was a chopping machine in which the sorted plastic waste is chopped for further processing.

In another factory, which was basically a processing factory, the chopped material is washed in a bath properly and dried. It was dried in a big hopper along with addition of caustic soda and some other chemicals to flush out undesired components. The waste was then processed in a well built compression molding machine. And we get fine pieces of distinguished color of new recycled polymer. We were also shown a unit where there was a water purifier unit by which water was reused. Refreshments were then given to each student and the same bus routed back to college

SWACCHTA DRIVE

On 9th August, 2018, the Polymer Science department of Bhaskaracharya College of Applied Sciences organized a cleanliness drive under the name of Swacchta Day. All the students, teachers and lab staff had taken part in this drive. All chemical bottles were thoroughly cleaned and rearranged alphabetically. All the unused and expired chemical bottles were disposed off. Sinks, shelves, compartments, almirahs and staff room were also cleaned. The students were provided with instructions about how to keep the laboratory clean and safe.Later on refreshments were also served

RHYME BOX

A collection of short stories and poems

Special thanks to Sunil Choudhary, Polymer Science,3rd year

जिंदगी दिया खुद का तोहफ़ा है...
यही सबको बतलाना है,
पर जिंदगी एक पल की तो है,
इसे जीना सीखना भी अनिवार्य है।

By Hitesh Duggal
(Polymer Science, 3 rd year)

रिश्तेदार

रिश्ता है मेरा उनसे,
इसलिए मै चुप हूँ ।
इतनी बर्दाश्त करके भी मै मौन हूँ,
समझ लिया है जीवन को एक रणभूमि..
जहाँ युद्ध होगा अपनों से ही और अपनों के लिए ही,
तो मै भी लड़ने के लिए हर पल तैयार हूँ।
फँसी हुई रिश्तों की डोर ही मुझे कमज़ोर करती है,
वरना मै तो बचपन से ही दमदार हूँ।
उम्मीदें हैं उनकी कुछ मुझसे,
उन्हें पूरी करने के लिए भी खामोश हूँ।
रिश्ता है मेरा उनसे,
इसलिए मै चुप हूँ।

By Komal
(Polymer Science,3 rd year)

याद

थोड़ा थक सा जाती हूँ अब मैं...
इसलिए, दूर निकलना छोड़ दिया है,
पर ऐसा भी नही हैं कि अब...
मैंने चलना ही छोड़ दिया है।

फासलें अक्सर रिश्तों में...
अजीब सी दूरियां बढ़ा देते हैं,
पर ऐसा भी नही हैं कि अब मैंने...
अपनों से मिलना ही छोड़ दिया है।

हाँ जरा सा अकेला महसूस करती हूँ ...
खुद को अपनों की ही भीड़ में,
पर ऐसा भी नहीं है कि अब मैंने....
अपनापन ही छोड़ दिया।

याद तो करती हूँ मैं सभी को...
और परवाह भी करती हूँ सब की,
पर कितनी करती हूँ...
बस बताना छोड़ दिया ।।

By Mamta Gupta
(Polymer Science, 2 rd year)

एक लड़की के मन का संसार

कहती नहीं है कुछ भी बस अपने मन में छुपाए रखती है..
एक बेटी अपना एक संसार अपने मन में भी बसाए रखती है..
छुप छुप कर ही सही वह कभी हँसती है,तो कभी रो दिया करती है..
कितना वक्त और है इस घर में उसका ये सोचकर वह खुद को कहीं खो दिया करती है..
सोचती है पहाड़ जैसी बातें पर किसी से कहा नहीं करती है..
उन बातों को सोच कर अंदर ही अंदर कहीं कुढ़ जाया करती है..
जो दिल कभी अपनी मन की करने से पहले सोचता नहीं था..
कैसे वो बड़े बड़े फैसले खुद ले पाएगा,कैसे खुद को संभालेगा या कैसे पूरा परिवार चला पाएगा..
यह गुत्थियाँ कभी वो खुद से सुलझा नहीं पाती है..
और दिन प्रतिदिन इन सवालों में ही उलझ कर रह जाती है..
कुछ वक्त लगेगा और अभी उसको..समझना तो पड़ेगा ये दस्तूर उसको..
लाख सोचने पर भी वो अपनी सोच को ठहरा नहीं पाती है..
एक लड़की अपने मन में पूरा संसार छुपा जाती है..

By Aparna Sharma
(Polymer Science, Batch 2016-19)

प्यारा सा एक मेला

प्यारा सा एक मेला आया, बचपन के सब खेला लाया
गए देखने मेला पापा के संग, मन खुश हुआ देख के सब रंग,
कई खिलौने कई पकवान, देख लिया पूरा मैदान
दिल को रोका, आंख भर आई पर चेहरे पे थी मुस्कान
आखिर में माना ना मन तब, खिलौना कार पसंद आई जब
पापा को भनक ना लग जाए कहीं, पिता के अक्ष से आंख चुराई
पर पिता तो पिता है, जान के मेरे मन की बात
बेटे की चाहत पूरी करने में जग ने देखो खाई मात
दिखे ना मुझको आसपास अभी तो थे यही कहीं
मैंने पिता से अमीर कोई देखा नहीं।

अचानक से मेरे पीछे आए, उठा मुझको दुकान पे लाए
कहा मुझसे पसंद कर, लेगा क्या बता तो सही
मैंने पिता से अमीर कोई देखा नहीं
निकाले सौ रुपए, खरीद ली वो कार
मुझको मिल गया पूरा बाज़ार
मुझे ये राज़ कैसे बताए, दोस्त से थे वो उधार लाए
पता था मुझे जेब खाली है
होने ना दिया एहसास यही मेरी दीवाली है
थमा दी हाथ में कहने लगे वो.....मेरे बेटे की कार यही,
पिता जहां मेरी जन्नत वहीं,
पिता से अमीर मैंने देखा नहीं।

By Sachin Yadav
(Polymer Science, 3 rd year)

POLYBAGS

When I peep out of my school window
i see a garbage station,
loads of polybags
and lots of sacks!

Why! why! what's the need of polybags?
Those non-degradable poisonous substances …
Can jute bags or cloth bags be used?
Or even paper bags could do

How man is so dependent on polybags that
it has became his lifeline …
To save himself,
he needs to stop the use of polybags

Burning of polybags causes smoke,
harmful for plants and trees ,
lack of oxygen, death of man …
Is man ready for that? ?

By Anmol Malhotra
(Polymers science, 2 nd year)

IF POLYTHENES WERE HUMAN

It's not me who pollutes your earth. Yes Uncle Aunt, it's you.
I accept that I can't die but aunt u can reuse me. I will do all your works from carrying vegetables from the market to helping u in packing food for uncle..... U know how I was born? When my father ethylene get married not only to one mother ethylene but more than 10,000 mamma ethylene then they reproduce me. Huh! It took a lot efforts and you guys just throw me like an orphan child on the streets. I feel lonely and just randomly rolls over there but there are many polythene friends who were left there by someone like you. Some of my poor friends were eaten up by the monsters cows but guess what, we are not less than any one. We in return affect their health. Other friends get buried under soil and since we can't die, so we spent our whole lives there by eating up the fertility of the soils which doesn't allow your poor baby plants to grow. If you will not treat us respectfully, we will continue destroying your world. So either find a way to kill us or send us to orphanage (recycling factories) after using us so that our next generation doesn't face all this humiliation that you bloody people give us.

By Smriti Jha
(Polymer Science,2 ND year)

ARTICLES

Recent Trends in Drug Delivery System Using Protein Nanoparticles

Recently, it has been studied that the drug carriers itself may risks to the patients. So, it becomes very important to synthesis material which can be used for drug targeting. In this perspective, nanocarrier based drug targeting strategies seems very useful to improve the selective delivery of drugs to the site of action. The main focus of pharmaceutical industry is to reduce the toxicity and side effects of drugs. Hence, proteins are compatible with biological systems they are biodegradable too they offer a multitude of moieties for modification to tailor binding, imaging or targeting entities. Thus, protein nanoparticles provide marvelous contribution as a carrier for drug delivery system.

Therapeutic nanoparticle technology has increased the drug efficacy and therapeutic index of the drug. The little toxicity of the nanoparticle is blindfolded by its fabulous applications and solution offered with drug delivery. Long back a research was done with metal nanoparticles as carrier for chemotherapeutic agents, but studies shows that it has toxic effects in human body. So the focus has been shifted towards developing biodegradables nanoparticles as effective drug delivery devices. The drug used for drug targeting is dissolved, absorbed or encapsulated into the nanoparticle matrix as shown in fig.1. According to the preparation method nanoparticles, nanospheres or nanocapsules can be obtained with different properties and release characteristics.

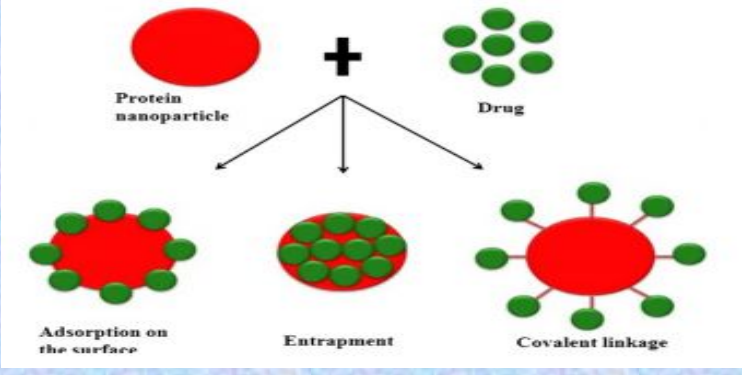


Fig.1. Method of Drug loading

Proteins are one of the natural molecules that have unique functionalities and potential application in biological as well as material fields.

They have been widely used for the fictionalization of the surfaces of the inorganic nanoparticles to impart biocompatibility to a certain extent. In the drug targeting, protein themselves have been proven to be better drug carriers when compared to the inorganic nanoparticles. Their Nano metric sizes, the presence of high number of functional groups available for modification, highly precise structure and biodegradability make them attractive for targeting.

Albumin is a protein based nano carier which is the most abundant plasma protein and it is produced in the liver at the rate of 10-15g/day. The serum of Albumin regulates the blood pressure by adjusting the blood volume. They help to transport of hormones, bilirubin, free fatty acids and drugs like warfarin phenytoin etc.

There are three types of Albumin:

1. **Ovalbumin:** It refers to as the egg white protein. It is majorly used in food matrix design. It has no shelf life, low cost, capable of forming gel networks and used as stabilizers for emulsions. It is sensitive to ph and temperature.
2. **Bovine Serum Albumin (BSA):** this type of albumin is separated from serum albumin of cow and used as a protein concentration standard. Edwin Cohn purification methodology is used for extracting it from the blood serum.
3. **Human serum albumin (HSA):** This type of albumin is highly stable in ph 4-9 and can be heated to 60^0C and dissolved in 40% ethanol.

As major plasma protein albumin has a distinct edge over other materials for nanoparticle preparation, they also posses reactive groups on their surfaces that can be used for ligand bindings or surface modifications. Drugs that interact in albumin nanoparticles can be digested by protease and drug loading can be quantified.

APPLICATION

Albumin Nano sphere can be used to entrap chemotherapeutic agents like 5-flurouracil doxorubicin and methotrexate. The study shows that the albumin Nano sphere sustained release of the formulations from 20-144 h with maximum therapeutic efficiency when compared to the pristine form of the drug.

Albumin nanoparticles that bound paclitaxel has been approved by FDA as Nano albumin (NAB) technology and this system can be used for treatment of breast cancer.

The albumin carriers are also used in tissue engineering for e.g. BMP-2 loaded albumin Nano spheres have been studied for bone regeneration.

By Juhi Gupta and Sunil Choudhary
(Polymer Science, 3 rd year)

Life cycle analysis

It is study of whole life cycle of a product from its raw material extraction to its disposal or recycling process and asses the possible environmental impact associated with each and every stage of product production.

Life cycle can be defined as analyse and evaluate the environmental impact associated with each and every step of product life.

Various stages involve in product manufacturing and uses are;

- Raw material extraction through material processing
- Manufacturing
- Distribution
- Use
- Repair
- Maintenance
- Disposal
- Recycling

Importance of life cycle analysis

Narrow outcome on environment can be improve by LCA by

- Compiling an inventory of applicable material energy and material input and environmental release
- Assessing the potential impact associated with identified part and release
- More informed decision can be taken by interpreting the results
- Provides information for improve process, support policy and sound basis for informed decision

LCA and sustainability

The environmental deterioration stimulates our interest towards such a product life which is reliable and has less negative impact on environment. A sustainable product which is enable to support demand of future generation and reduce the environmental burden.

For this LCA provides a tool as comprehensive environmental burden analysis. Since it enable us to organized complex environmental, economic and social data in structural form and helps in assessing all positive and negative environmental impact due to product life .

It gives idea that one product is more sustainable over another, for example that it has less carbon foot prints.

LCA started in 1960s as it able to provide the flow analysis of energy. Later in 1980s and 90s came into more attention because it's possible account for comprehensive environmental analysis.

ISO 14040 and ISO 14044 two ISO standards set a frame work for LCA, involves ISO 2006a, ISO 2006b.

Life cycle is performed by collecting the data at every stage of the life cycle from cradle gate crave involved using literature studies, interviews measurement , theoretical calculation , data bank and qualifying guesses.

Why LCA?

- LCA is most reliable method to verify the environmental effect and measure the possible improvement in the product life by establishing a benchmark .
- Companies used LCA to demonstrate the transparency and reliability of product to stakeholder and consumer
- It is used to develop and make new technology ,when the carbon footprints is important to future marketing and also for cost control
- LCA is reliable ,establish transparency to both manufacture and consumer using data.
- Industries and company used LCA to compare more reliable product among the product or service that perform the same function.

STEP INVOLVE IN LCA

- **Goal and scope** - this step define the purpose of the LCA and its scope ,boundaries and assumptions that are taken while performing LCA of particular product life .
- **Analysis**-it involves the identified and quantified the input and output of the product .Based on the collected data inventory tables are made.
- **Assessment** : In this steps all the possible environmental impact in each stage is studied and evaluated.
- **Interpretation**: Based on above step result possible environment improvement opportunities are identified and value judgements made.

Understand these by taking the example of LCA of plastic and glass bottles .
LCA of plastic and glass bottles for beverage packaging system using ISO14040 methods.
Goal of this LCA study was to determine the environmental impact of glass bottles compared with PET bottles .The functional unit was defined as 'one piece 33 Cl bottles'.

System boundaries : LCA was performed as mention in ISO14040 ,from raw material extraction and fuel used ,all conversion steps involve in making products ,delivered to consumer ,finally to end up of product in landfill.
The result shows that PET bottles have less environmental impact than glass bottles. As per data it is clear that glass bottles product consume high amount of energy due to its heavy weight transportation cost also increases whereas in case of PET bottles they requires less energy for production ,easy to handle light weight ,ease of transportation .because of all these factor it has less environmental burden.
LCA is used to insight in saving options, increases market value ,insights in environmental impact , substantiate a strategic decision ,development of innovation.it is very useful evaluating tool.

By Nitika
(Polymer Science, 3rd year)

BIOCHAR

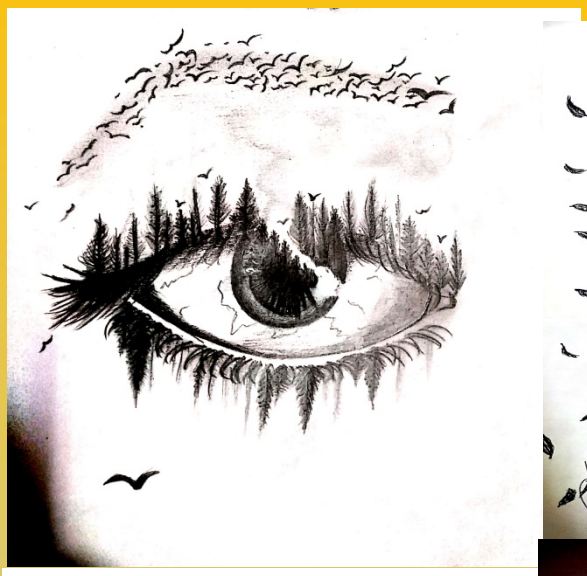
According to the estimated reports it is found that approximately 4.4 billion tones of solid waste is generated by Asia alone and 790 million tones of MSW of which 490 million tones of MSW is generated in India. It has also been reported that in India 600 million tones of agricultural waste is generated annually, in which approximately 90 million tons of agricultural waste is produced only by sugar industries. Therefore handling of such huge amount of agricultural waste is a major concern not only in India but all over the world. Commercially this waste coming from agriculture sources mostly being burnt there by majorly contributing in global warming. Therefore to reduce the contribution of agricultural waste in global warming it is converted into more useful product 'biochar' through the process named pyrolysis. According to the International Biochar Initiative (IBI) "biochar is a carbon rich stable solid material obtained from the thermochemical treatment of agriculture waste in a limited environment of oxygen". The large production of agricultural waste in all over the world provides an abundant source for the preparation of biochar. Biochar is black colored product having no structure and high surface area. Nitrogen, Carbon, oxygen and nitrogen containing elements contribute to the major structure of biochar, also phosphorous, silicon and sulphur shows wide range of mass percentage in specific biochar for example biochar containing silicon produced by pyrolyzing maize, rice or wheat based biomass. When we talk about applications of biochar, biochar offer wide range of applications due to their cheap and sustainable properties. Biochar degrade slowly and has long life which is approximately equal to the life of soil therefore exhibit long term stability in soil when compared with raw biomass. Biochar amendment has considerable contribution to alleviate climate change by reducing carbon dioxide , methane and nitrous oxide emissions as well as the addition of biochar improves the quality of soil and plant productivity by increasing the water holding capacity of soil, increasing soil pH and carbon content. Due to high sorption property of wood based biochar it is used in the treatment of PTF contaminated water and wastewater.

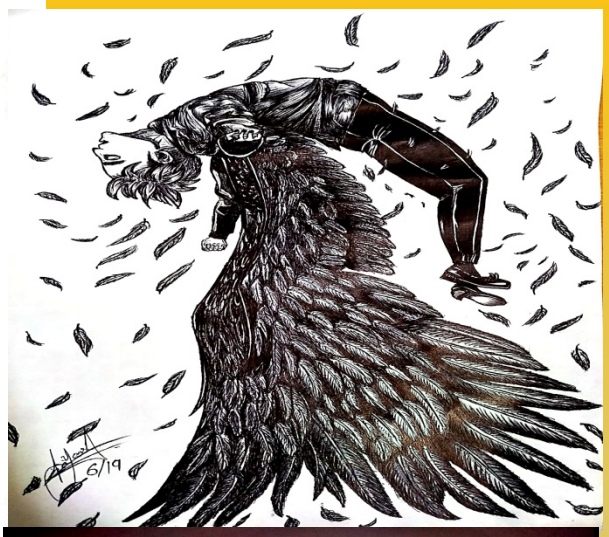
By Nitika
(Polymer Science, 3rd year)

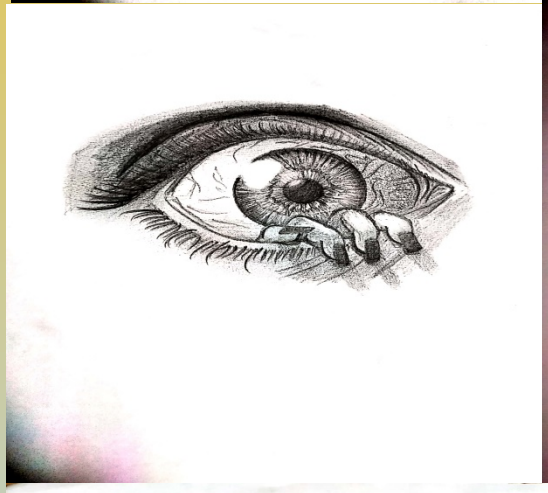

A WORK of
ART
ROAD-KING
Car

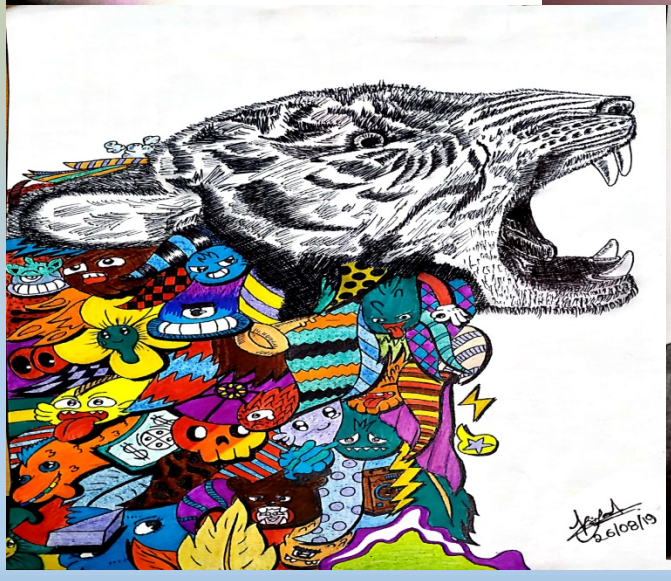
By Shiva
Polymer Science, 3 rd year

By Shubham Singh
Polymer Science, 3 rd year

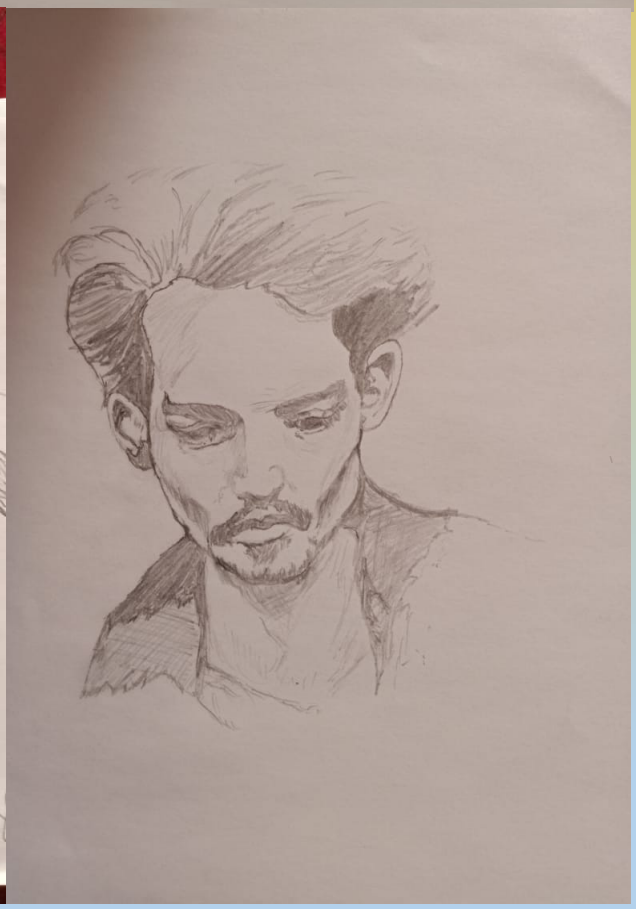








By Priyansh
Polymer Science, 3 rd year



By Mamta Gupta
Polymer Science, 2 nd year

Student Achievements of our department

Student's Name	Year	Achievement
Shantanu Pandey, Ishan Bhatt, Sanjay Kumar	Batch 2016-19	Secured 2nd position in Kabaddi in interdepartmental tournament, 2018
Chetan Kumar Mishra, Krishna Yadav, Adesh Gupta, Sachin Yadav, Ajay Negi	3rd year	
Naveen Yadav, Amit, Shubham Yadav	2nd year	
Komal	3rd year	3rd position in shot-put in interdepartmental tournament, 2018
Shubham Yadav	2nd year	Secured 1st position in 1600m race in interdepartmental tournment,2018
Neema Khushawa, Nidhi Bijlawan and shantanu Pandey	Batch 2016-19	Awarded "Best Paper Award" at the National Conference on New Trends in Nanotechnology and Application" held on September 27-28, 2018; ARSD College, New Delhi
Shantanu Pandey, Sumit Kumar, Siddhanth Saxena	Batch 2016-19	Awarded 1st position in Battle Of Bands at Satyawati College, DU, 2018
Mridhul Khanna	2nd year	
Ritika Yadav, Surbhi Awasthi, Yuktanshi	Batch 2016-19	Secured 1st position in football interdepartmental tournament, 2018
Riddhi dhawan, Jyoti Dahiya	3rd year	
Ritika Sharma	2nd year	

Student's Name	Year	Achievement
Sumit Kumar	Batch 2016-19	Secured 2nd position in Solo Singing interdepartmental tournament, 2018
Siddhanth Saxena, Sanjay Kumar, Ishan Bhatt, Dhruv Saini, Shantanu Pandey	Batch 2016-19	Secured 1st position in football in interdepartmental tournament, 2018
J Benjamin Leonard, Adesh Gupta	3rd year	
Shubhanshu, Amit	2nd year	
Juhi Gupta, Sunil Choudhary	3rd year	Awarded for having the Best Poster in the two day National Conference on "Clean And Green Energy: The Chemical and Environmental Aspects" held on 26-27th Sept,2019 at Bhaskaracharya College Of Applied Sciences
Priksha Gupta	3rd year	Co-author of book 1000 WOMEN holding a Vajra World Record, 2019
Shubham Singh	3rd year	Secured 1st position in Inter DU Drawing Competition,2018 President of Akriti, the Fine Arts Society, 2019
Dhruv Saini	Batch 2016-19	President of Fine Arts Society, 2018
Juhi Gupta	3rd year	Treasurer of Fine Arts Society,2019
Siddhanth Saxena	Batch 2016-2019	President of Moksh, The Music Society of BCAS, 2018
Adesh Gupta	3rd year	Central Counsellor in BSA, 2019
Maanvi Bhutani	3rd year	Event Management Head in ECA, 2019 Treasurer of Rage, The Dance Society of BCAS, 2019

ALUMNI OF BATCH 2015-2018

URVEE PATEL
Year of Passing: - 2018
Current Designation: - MSc. Environmental Science from GGSIPU, Delhi.

HIMANSHU KUMAR
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

VIVEK KUMAR PANDEY
Year of Passing: - 2018
Current Designation: - MBA from Institute of Co-operative and Corporate Management, Lucknow.

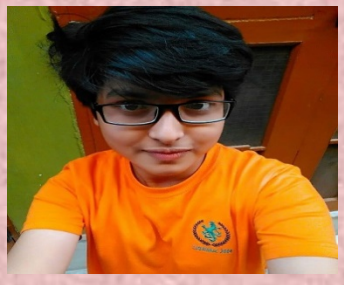
VIVEK
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

NAKUL MAHAJAN
Year of Passing: - 2018
Current Designation: - MBA from Jammu University.

SACHIN SHARMA
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

PANKAJ TOMAR
Year of Passing: - 2018
Current Designation: -MSc. Environmental Management from Forest Research Institute, Uttrakhand.

SAIYAM DOBHAL
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.



DIVYA MISHRA
Year of Passing: - 2018
Current Designation: - Post Graduation Diploma in Packaging from IIP, Delhi.

RAJAT KUMAR SINGH
Year of Passing: - 2018
Current Designation: - MBA from Symbiosis International Deemed University, Maharashtra.

RAHUL SHARMA
Year of Passing: - 2018
Current Designation: - Post Graduation Diploma in Packaging from IIP, Delhi.

PARTH BIDHALIYA
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

KAISAR AZAD
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

RAHUL NANDA
Year of Passing: - 2018
Current Designation: - Post Graduation Diploma in Packaging from IIP, Delhi.

RATANJEET PRATAP SINGH
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

AVINASH SANDALIYA
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

SHIVAM PANDEY
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

GAMBHIR SOLANKI
Year of Passing: - 2018
Current Designation: - MBA from Institute of Management and Technology and Working as Team Leader in Flipkart.

ARJUN SINGH
Year of Passing: - 2018
Current Designation: - Working in A.S. Shoes Accessories Pvt. Ltd.

AVINASH KUMAR
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

MONU RAGHAV
Year of Passing: - 2018
Current Designation: - MSc. Polymer Science from CIPET, Gujarat.

VANITA
Year of Passing: - 2018
Current Designation: - Studying at University of Bordeaux, France.

MONI KUMARI
Year of Passing: - 2018
Current Designation: - Studying at University of Bordeaux, France.

ALUMNI OF BATCH 2016-19

SURABHI AWASTHI
Year of Passing: - 2019
Current Designation: Diploma in Elementary education from Etawah.

SIDDANTH SAXENA
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

SIDDARTH TEWATHIA
Year of Passing: - 2019
Current Designation: Preparation for Government job

SAACHI SINHA
Year of Passing: - 2019
Current Designation:-MSc polymer Chem and technology at CCS University Meerut.

RITIKA YADAV
Year of Passing: - 2019
Current Designation:- MSc polymer Chem and technology at CCS University Meerut.

DHARMENDRA KUMAR
Year of Passing: - 2019
Current Designation:- MA Economics

APARNA SHARMA
Year of Passing: - 2019
Current Designation:- Preparing for civil services

ISHAAN BHATT
Year of Passing: - 2019
Current Designation:- Government job preparation

HARSHIT
Year of Passing: - 2019
Current Designation:- MSc polymer Chem and technology at CCS University Meerut.

SUMIT KUMAR
Year of Passing: - 2019
Current Designation:- MSc polymer Chem and technology at CCS University Meerut.

GURSEWAK SINGH
Year of Passing: - 2019
Current Designation: MSC PS from CIPET Ahmedabad.

PRASHANT GANGWAR
Year of Passing: - 2019
Current Designation: Preparation for government job

RAHUL SINGH
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

SATWIK GUPTA
Year of Passing: - 2019
Current Designation: preparing for MAT, CAT for MBA

SANJAY KUMAR
Year of Passing: - 2019
Current Designation: Preparing for government job

SUMIT SINGH
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

RAHUL KUMAR
Year of Passing: - 2019
Current Designation: Preparation for UPSC

MOZAMMILL
Year of Passing: - 2019
Current Designation: MSc PS from mohanlal college, Udaipur

ANKITA BARUA
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

ANIKET TYAGI
Year of Passing: - 2019
Current Designation:- Preparing defense services AFCAT

MUKUL KUMAR VARSHNEY
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

YUKTANSHI
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

YASH JAIN
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

MEHAK BANSAL
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

RAJ KUMAR
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

NIDHI BIJALWAN
Year of Passing: - 2019
Current Designation: Post graduate diploma in packaging from IIP

SACHIN KUMAR PRAJAPATI
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

SHUBHAM PRASAD
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

AISHWARYA GAUR
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

SANDEEP TRIPATHI
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

SHANTANU PANDEY
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

DHRUV SAINI
Year of Passing: - 2019
Current Designation: MSc PS from CIPET Ahmedabad.

MUSKAN GUPTA
Year of Passing: - 2019
Current Designation: government exam preparation

KAPIL SHARMA
Year of Passing: - 2019
Current Designation: MSc Chem from IGNOU.

ANURAG SHUKLA
Year of Passing: - 2019
Current Designation: Diploma in Packaging from IIP, Delhi.

GAURAV BHANDARI
Year of Passing: - 2019
Current Designation: government exam preparation

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Dr. Anil Barak

Dr. Prem Lata Meena

Dr. Gulshan Dhra

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Hitesh Duggal

Juhi Gupta

Sunil Choudhary

Ankun Goyal

Maanvi Bhutani

Sachin Yadav

Komal

Priksha Gupta

Mridhul Khanna

Mamta Gupta

TEAM BAHULAK
2019-20

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