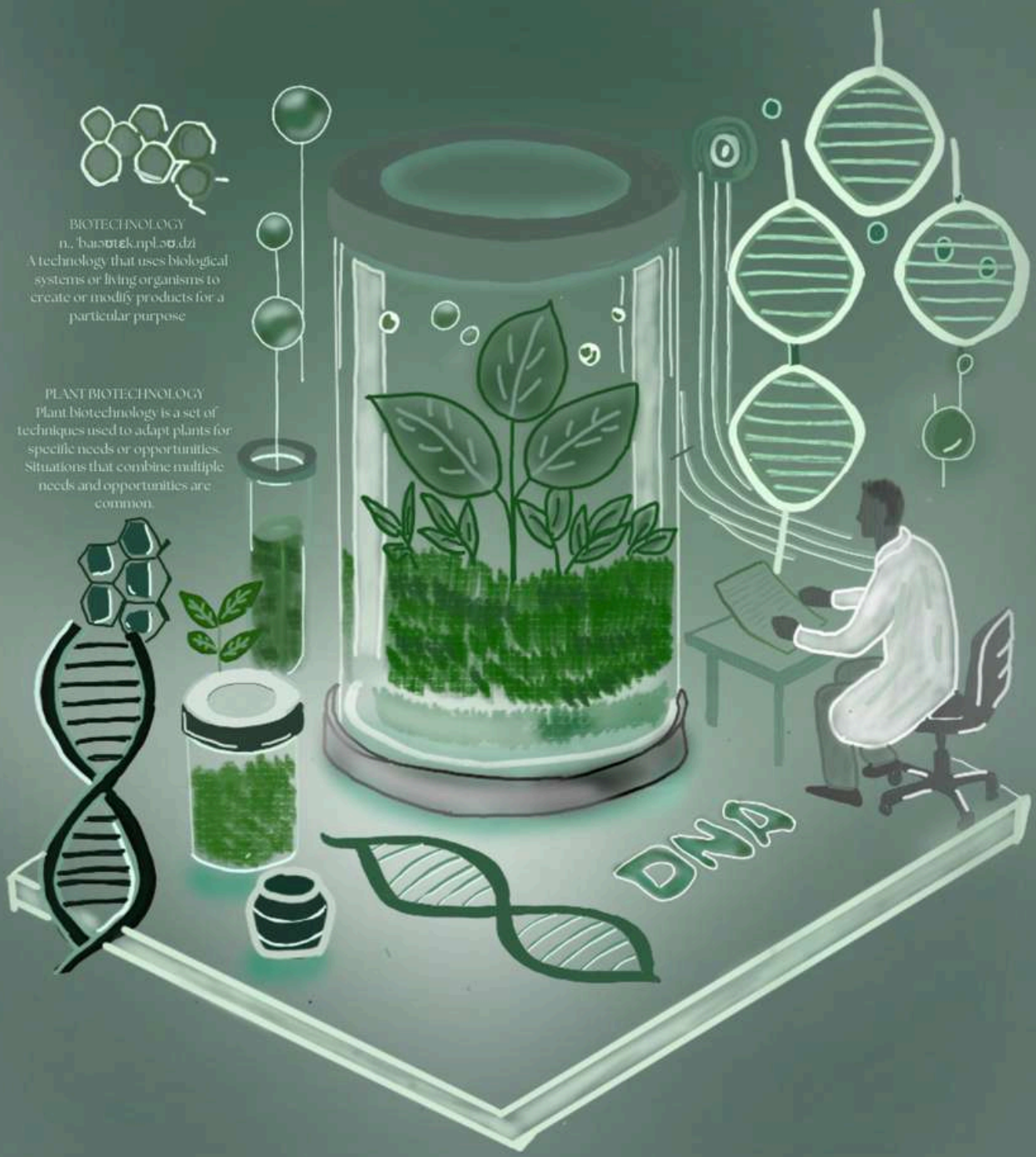
ST. XAVIER'S COLLEGE, MAPUSA-GOA

DEPARTMENT OF BIOTECHNOLOGY



SEQUENCE

Unravel yourself

2024-2025

Vision

Availability of Biotechnological studies and research to improve the living conditions of mankind and the environment

Mission

Education and training opportunities for students such that they get mastery in biotechnological skills.

Follow us on...

@biotechmoments

Biotech moments

Principal's note

It is with great pleasure that I pen these few lines for the latest edition of the Department of Biotechnology Newsletter "Sequence: Unravel Yourself." This publication showcases the department's enthusiastic engagement in overall student development together with academic excellence.

I congratulate the Coordinator of the Department and the Editors together with the entire editorial team for all the efforts put in to release this newsletter.

In the words of Ryan Bethencourt, *"Our world is built on biology and once we begin to understand it, it then becomes technology."* Wishing the faculty and students much success in all their endeavors.

-Ms. Ursula Barreto
Acting Principal

Administrator's messege

Biotechnology is a rapidly evolving field that holds the potential to revolutionize healthcare, agriculture, and environmental sustainability. I extend my heartfelt congratulations to the Department of Biotechnology on the release of its latest newsletter. This publication serves as a testament to the department's pursuit of academic excellence and student engagement. May this newsletter continue to inspire and foster a culture of curiosity, discovery, and knowledge-sharing within our academic community. I wish our students all the best as they pursue their studies in the field of Biotechnology.

Wishing the Department of Biotechnology continued success in all its endeavors.

-Fr. Antonio Salema
Administrator

Co-ordinator's address

It is a moment of immense pride and joy as we celebrate the release of this special edition of our departmental newsletter, coinciding with a remarkable milestone—20 years of academic excellence, innovation, and growth. Over the past two decades, our department has grown leaps and bounds, nurtured young minds, fostered research, and contributed significantly to the field of biotechnology, owing to the support of the Management, the Principals, the enthusiastic students and dynamic faculty.

Every new edition of the newsletter, is an opportunity for our beloved students to showcase their talents on a broader spectrum and this publication is a true reflection of their hard work, dedication, and passion. I appreciate my dear students for their creative contributions towards this newsletter.

I extend my heartfelt congratulations to the Editors, Ms. Sonali Kajoli and Ms. Emma Fernandes and the student members of the Editorial Team. Your dedication in capturing the department's achievements, research initiatives, and student-driven activities is truly commendable. Through your efforts, this newsletter serves as a window into the vibrant academic and research culture of our department. It serves as a testament to our collective efforts and unwavering commitment to knowledge, research, and innovation.

As the Coordinator of this course, it is both an honor and a privilege to lead such a dynamic and dedicated group of students and faculty. Witnessing the progress of our department and the remarkable achievements of our students fills me with immense pride.

I would like to express my sincere gratitude to every member of the department for their unwavering support, understanding, and enthusiasm, which have made my role much more fulfilling and enjoyable. Without your dedication and cooperation, this journey would have been far more challenging. I am truly grateful and would like to express my sincere thanks to the Administrator, Rev. Fr. Antonio Salema, the Acting Principal, Ms. Ursula Barreto and Vice Principal, Ms. Sandra Fernandes for their support and guidance every step of the way.

As we move forward, I encourage everyone to continue striving for excellence, embracing new challenges, and contributing to the growth of the department.
May this edition inspire many more milestones and successes in the years to come!

-Ms. Jocelyn Fernandes
Course Co-ordinator
Department of Biotechnology

Editorial

Welcome to another exciting edition of ***"Sequence: Unravel Yourself"***, the official newsletter of the Department of Biotechnology. This issue holds special significance as we celebrate 20 years of excellence and growth in our department. Over the past two decades, we have witnessed remarkable advancements in biotechnology, and our department has continuously evolved, embracing new research and academic excellence.

We extend our heartfelt gratitude to all contributors, faculty and everyone who has supported this initiative. Your enthusiasm, creativity, and dedication have played a vital role in making this edition a success. Whether through insightful articles, research highlights, creative pieces, or innovative ideas, your efforts have enriched the newsletter and made it a true reflection of our vibrant biotech community.

We would like to express our sincere gratitude to our Course Co-ordinator Ms. Jocelyn Fernandes and faculty members for their invaluable support in bringing ***"Sequence: Unravel Yourself"*** to life. Your encouragement has played a crucial role in shaping this edition, allowing us to showcase the latest advancements, student achievements, and creative expressions within the Department of Biotechnology. We extend our deepest gratitude to our esteemed Principal (Acting) Ms. Ursula Barreto, Administrator Rev. Fr. Antonio Salema and Vice Principals Ms. Sandra Fernandes and Dr. Filipe Rodrigues e Melo for their leadership and continuous encouragement.

As we celebrate this milestone, we reflect on our journey with pride and look forward to shaping the future of biotechnology with continued dedication and passion. Here's to many more years of success and innovation!
Happy reading!

Ms. Sonali E. Kajoli
&
Ms. Emma Fernandes
Editors

Writer's Corner

Articles

Sustainable Bio-Leather for a Greener Future

The growing demand for sustainable alternatives to traditional leather has led to the exploration of various plant-based materials, with Spineless Cactus and hybrid Napier emerging as promising candidates for bio-leather production. Not only do they provide an environmentally sound solution, but their scalability holds the potential to meet industrial demands contributing to the reduction of environmental footprint from the fashion and automotive industries.

Spineless cactus, particularly varieties like *Opuntia ficus-indica* , is a climate-resilient crop recently introduced in India. It is well-suited for arid and rainfed areas, capable of tolerating drought, high temperatures, and frost due to its ability to survive long periods without water. It requires minimal water and no pesticides, positioning it as a sustainable crop for resource-scarce regions. This plant is easy to grow and offers many benefits. The plant's versatile uses— ranging from food and fodder to fuel and fertilizer—makes it a key contributor to achieving multiple Sustainable Development Goals (SDGs).

Notably, the fibre-rich composition and flexible texture makes it an ideal candidate for producing leather-like materials. Unlike conventional leather, which relies on animal agriculture, cactus leather is biodegradable and offers a sustainable alternative. With remarkable durability, flexibility, and texture, cactus leather is suitable for a variety of products, including footwear, bags, and upholstery. Scaling up cactus leather production through expanded cultivation on dry, arid lands could meet the growing demand for sustainable materials, while investing in processing infrastructure would enhance the efficiency and volume of bio-leather production. Spineless Cactus has been successfully transformed into bio leather and one of the brands that made this possible is a Mexican brand called *Deserto*.

Hybrid Napier, known for its high cellulose content, also shows immense promise for bio-leather production. This crop reaches maturity in just a few months, making it a scalable resource for bio-leather production. It thrives in various climates and requires little water, making it highly sustainable. The cellulose fibers extracted from Hybrid Napier can be transformed into a durable, lightweight material mimicking the characteristics of traditional leather. By scaling up cultivation on land suited to grass farming and optimizing cellulose extraction techniques, Hybrid Napier could become a significant player in the bio-leather market. Research and automation in processing methods could further enhance the quality and output of this material, making it viable for mass production in industries like fashion and automotive. The use of Hybrid Napier for bio-leather has not yet been proven, but Tata Chemicals is pioneering this approach as an industry first.

Together, Spineless Cactus and Hybrid Napier represent two of the most promising plant-based materials for large-scale bio-leather production. As processing technologies improve and more land is dedicated to their cultivation, we can anticipate widespread adoption of bio-leather in commercial applications. This innovation not only offers a sustainable alternative to animal-driven leather but also contributes to a circular economy, reducing dependency on synthetic materials and promoting environmental sustainability.

–Ms. Katelyn Pinheiro
(S.Y. B.Sc 2024–25)

"Disease X"

As I was reading about the history of the Coronavirus pandemic, my curiosity led me through stories of past outbreaks—SARS, MERS, Zika, Ebola. Each one felt like a chapter in the tale of humanity's struggle against an invisible enemy. But then, a strange term caught my eyes - "Disease X." At first, it sounded like something out of a sci-fi movie—a codename for a mysterious threat. But as I clicked one link after another to know more about this term, I realized it was much more than what it looks. Disease X is a real concept, a warning from scientists and health experts about the next potential pandemic. It stood for a yet-unknown disease, one that could change the world as we know it.

The parameters that define Disease X are both fascinating and daunting. It could be caused by a novel zoonotic pathogen, something humanity has never encountered. It must have the potential to spread globally, wreaking havoc on public health systems. Its transmission might be swift and relentless, whether airborne, through contact, or via vectors. And most chillingly, it could have a high mortality rate, posing an existential threat to humanity. Reading these criteria was like peering into a shadowy future, where the next global crisis could emerge from any corner of the natural world.

The WHO's actions regarding Disease X are rooted in a proactive measure. Recognizing the inevitability of emerging diseases, the organization has included Disease X in its R&D Blueprint for Action to Prevent Epidemics. This blueprint is essentially a roadmap for accelerating the development of diagnostics, therapeutics, and vaccines for high-priority pathogens. By acknowledging the unknown, WHO aims to ensure that the world is not caught unprepared. This involves fostering global collaboration, bolstering surveillance systems, and funding research into diseases that could leap from animals to humans. The idea is not to create a sense of panic but to cultivate resilience in the face of uncertainty.

For biotechnologists, the concept of Disease X is both a challenge and an opportunity. It serves as a clarion call to innovate and stay ahead of nature's curveballs. Biotechnologists play a pivotal role in developing the tools needed to combat emerging diseases. From sequencing genomes to engineering vaccines, their work underpins humanity's defense against microbial threats. The lessons learned from tackling hypothetical Disease X scenarios can lead to breakthroughs in understanding pathogenesis, enhancing diagnostic accuracy, and designing broad-spectrum antivirals. In a way, Disease X could be a catalyst for progress, pushing the boundaries of what's possible in biotechnology.

Disease X is a reminder of our vulnerability, a specter of what might come. But it's also a testament to human ingenuity and the power of preparation. The story of Disease X isn't just about a future threat; it's about our present actions and how they shape the world we leave for future generations. And perhaps, just perhaps, the concept of Disease X will remain a hypothetical—a lesson learned rather than a disaster endured.

-Mr. Vishal U. Mardolkar
Faculty

Bioplastics: A Sustainable Solution for the Future

In recent years, biotechnology has emerged as a transformative force, offering innovative solutions to global challenges like environmental degradation and resource depletion. The world has become increasingly aware of the environmental dangers posed by plastic pollution. Traditional plastics, made from petroleum, take hundreds of years to break down and contribute to vast amounts of waste in our landfills and oceans. As concerns over plastic pollution continue to grow, scientists are turning to biotechnology to find better solutions.

One such breakthrough is the development of bioplastics, a sustainable alternative to traditional plastics. By harnessing biological processes and renewable materials, bioplastics demonstrate how biotechnology can lead the way in creating eco-friendly materials that reduce pollution and promote sustainability.

Bioplastics are a new type of plastic made from renewable sources, and they offer a more sustainable and environmentally friendly option compared to traditional plastics. By using natural, plant-based ingredients and advanced biological processes, these companies are shaping the future of sustainable packaging, consumer goods, and even medical supplies.

Unlike traditional plastics, which are made from petroleum-based products, bioplastics are made from renewable materials, using natural resources like corn starch, sugarcane, or even algae. In some cases, bacteria are used to produce bioplastics like polyhydroxyalkanoates (PHA). These materials are turned into plastic through biological processes, which are more sustainable.

Bioplastics are already making their mark in several industries, and their uses continue to grow. Packaging companies like PepsiCo and Coca-Cola are exploring bioplastics in their bottles and snack packaging. Coca-Cola's Plant Bottle is made using up to 30% plant-based materials, a major step toward reducing the carbon footprint of plastic bottles. The medical industry is embracing bioplastics for their biocompatibility and biodegradability. PHA, is used in medical applications such as sutures and drug delivery systems.

Bioplastics offer several advantages over traditional plastics. Since bioplastics are made from plants and natural materials, they are renewable and don't deplete fossil fuels. The production of bioplastics often has a lower carbon footprint than petroleum-based plastics, helping to reduce greenhouse gas emissions.

However, bioplastics are not without their challenges. The production costs of bioplastics are still higher than traditional plastics, making them less accessible for mass production. Additionally, not all bioplastics are biodegradable, and some may require special composting conditions to break down. There's also the issue of resource availability—producing large quantities of bioplastics requires significant amounts of plant-based materials, which could compete with food production.

The bioplastics industry is full of exciting innovations. Researchers are working to enhance the properties of bioplastics, making them stronger and more versatile. By using renewable materials and reducing our reliance on fossil fuels, bioplastics can help pave the way for a cleaner, greener future. The biotechnology industry, along with forward-thinking companies, is leading the way in making this vision a reality.

–Ms. Vedika Marathe
(F.Y.B.Sc 2024–25)

Biotechnology's War on Cancer: New Hope & New Horizons

From celebrities to common man cancer is one of the leading cause of death worldwide. Cancer stands as one of the biggest challenges spreading because of radiations, living style, food habits etc. Even though we have enormous population suffering from cancer it requires a lot of research. Nowadays because of detection tools we are able to detect cancer and various other disease but back in the days of 1900's it was very difficult to detect whether it is a cancer or not.

A multitude of people off late acquiring cancer, therefore the human race and humanity is moving towards better treatment of cancer, wherein biotechnology steps into the spotlight, revolutionizing cancer treatment. It is emerging as a game changer in the fight against cancer, offering innovative solutions to diagnose, treat and manage this devastating disease.

The recent advancement in the field of biotechnology have led to the development of targeted therapies, immunotherapies, personalized medicines, gene editing etc, significantly improving patients outcome. Biotechnology has enabled the creation of targeted therapies, that selectively attack cancer cells, minimizing harm to healthy cells.

It has also led to the development of immunotherapies which harness the body's immune system itself to identify and attack cancer cells, And one such immune therapy is Chimeric antigen receptor (CAR) T-cell therapy, which involves genetically engineering patients own immune cells to target the cancer cells, offering a promising and a new approach to cancer treatment.

Biotechnology has the potential to revolutionize the field of cancer treatment. With continued investment in research and development we can expect to see even more innovative and effective treatment for cancer in future.

–Ms. Aashana Naik
(F.Y.B.Sc. 2024–25)

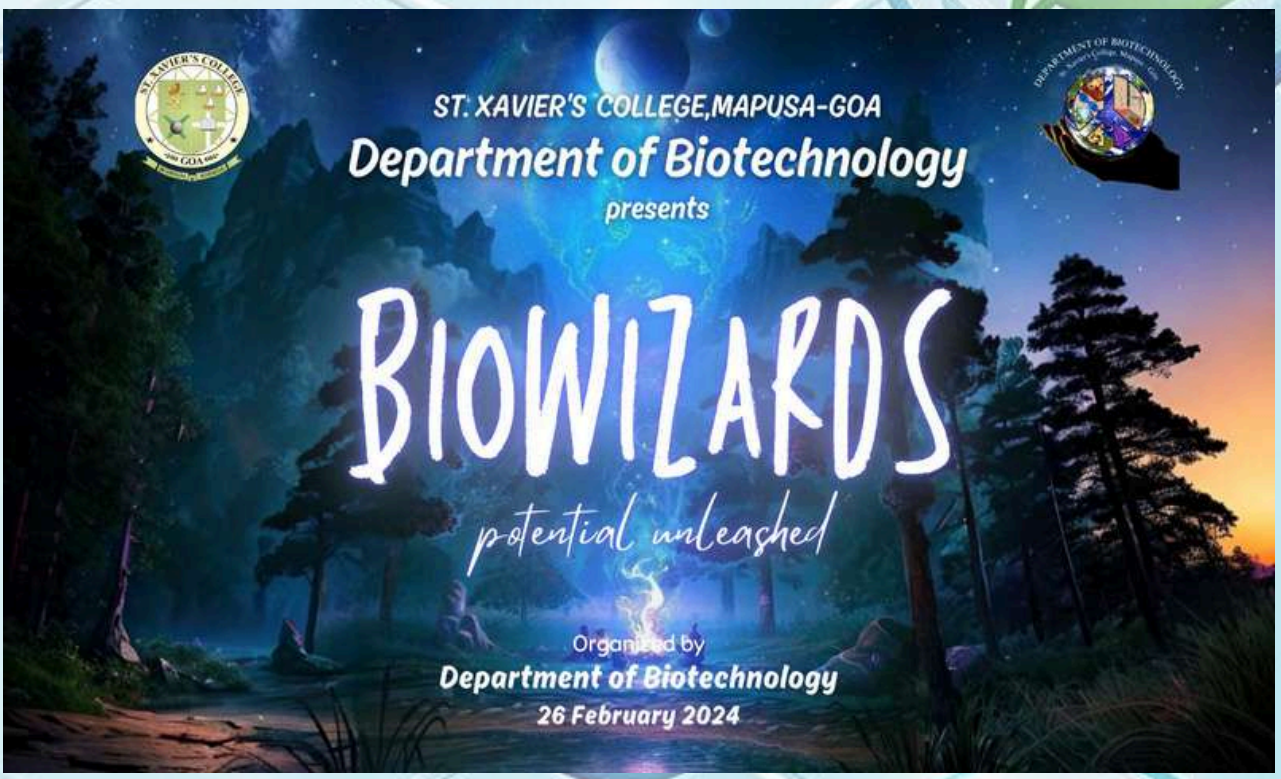
Activities

Biowizards 7.0: Potential Unleashed

The Department of Biotechnology organized the 7th annual Inter-Higher secondary school event **"Biowizards: Potential unleashed"** on 26th February 2024. The chief guest for the inaugural session was Mr. Richard Noronha, Designated Officers and Licencing Authority Directorate of Food and Drugs Administration, Bambolim-Goa. As a symbolic gesture, the Chief guest and the event coordinator, Mr. Vishal Mardolkar released the departmental annual e-newsletter "Sequence: Unravel yourself" during the inaugural ceremony of the event.

Total 8 different higher secondary schools from various parts of Goa participated for the event. Students from the participating HSSC engaged in series of competitions designed to test their knowledge, skills and creativity in the field of Biotechnology. After intense deliberation by the judges, Purshottam Walawalkar Higher Secondary School, Khorlim-Mapusa were declared team winners of "Biowizards: Potential unleashed." Sharada Mandir Higher Secondary School, Miramar won 1st Runner up, while Carmel Higher Secondary School, Nuvem won 2nd Runner up place for the event.

The course coordinator, Ms. Jocelyn Fernandes expressed gratitude to all participating Higher Secondary School, sponsors and volunteers for their invaluable contribution to the success of the event.



Glimpses Of Biowizards 2024

Winners of Biowizards 2024

Winner: Purshottam Walawalkar Higher Secondary School, Khorlim-Mapusa

1st runner-up: Sharada Mandir Higher Secondary School, Miramar

2nd Runner-up: Carmel Higher Secondary School, Nuvem

Field Trip to Maka Di Brewery

On 14th March 2024, the students of T.Y.B.Sc. Biotechnology along with 2 faculty members Ms. Swaroopa Naik and Ms. Anjelica Matias visited Maka Di Brewery situated in Nanoda, Bicholim, North Goa. The objective of the field trip was to study, observe, understand the various aspects and the functioning of a bioprocess plant.

The trip ended with a question answer session, where the brew master Dr. Dhavan Patel and students interacted.

Class of T.Y.BSc. Biotechnology (2023-2024)

Report on Nano Jatha Lecture Series

BITS Pilani, K K Birla Goa Campus

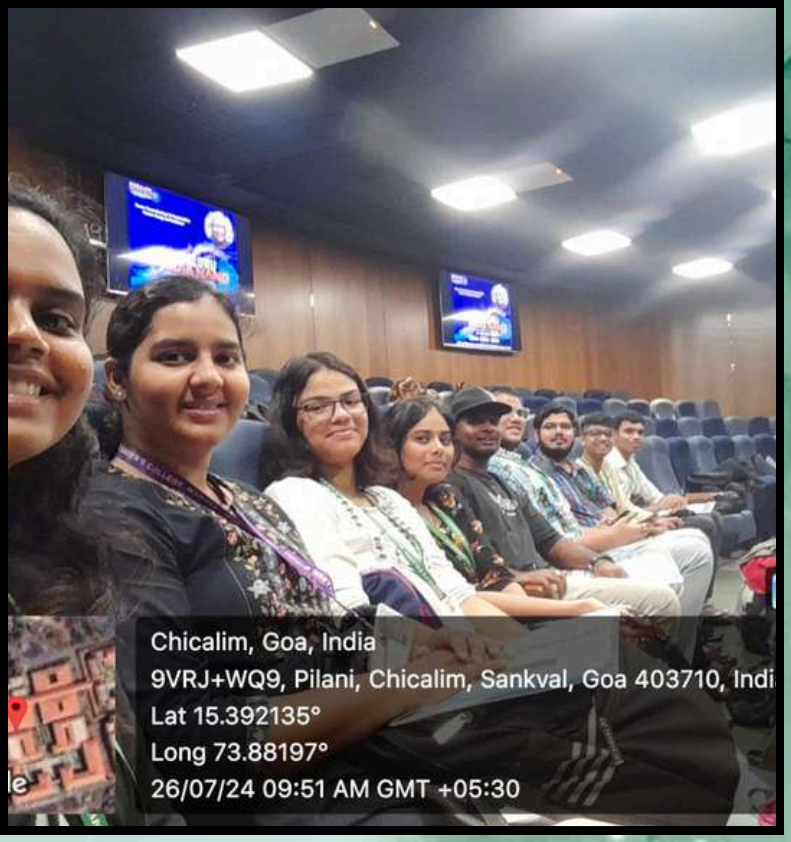
I attended the Nano Jatha Lecture Series, Roadshow, and Exhibition held at BITS Pilani, K K Birla Goa Campus on July 26, 2024. The event commenced with inaugural talks by the host and the coordinator. Esteemed professors, Dr. Meenal Kowshik, Dr. Bhavana, and Dr. H.S.S.R. Matte, delivered introductory talks that provided a comprehensive overview of the conference's themes. The lecture series began with Dr. H.S.S.R. Matte's enlightening presentation on "The New and Big Science of Small." This lecture delved into the fascinating world of nanoparticles, discussing their size, nano structures, photonic band gaps, the lotus effect, and its correlation to nanoparticles, Young's equation, and super hydrophobic surfaces.

The second lecture, delivered by Dr. Meenal Kowshik, focused on "Applications and Prospects of Nanobiotechnology: From Molecules to Systems." Dr. Kowshik introduced the concept of the Ferritin cage and its application in targeted cancer treatment, explained the workings of bacterial flagella, and discussed magneto tactic bacteria, target dyes, and molecules, as well as the broad applications of nanotechnology in biotechnology.

Post the informative lectures, attendees were treated to an exhibition showcasing eight innovative exhibits, including a piezoelectric pavement, graphene-based electric circuits, a microfluidic smart window, a galvanization reaction display, electricity generation from fruit juice, a humidity sensor for real-world applications, gold nanoparticles (Faraday's Sol), and a sustainable sodium-ion battery prototype.

The event concluded with a quiz competition, a tea break, and a prize distribution ceremony, followed by a vote of thanks. The conference provided a deep dive into the current and future prospects of nanotechnology, leaving a lasting impact on all participants.

–Ms. Shawna L. Castelino
(T.Y.BSc 2024–25)



Ms. Shawna Castelino (T.Y.BSc Biotechnology 2024-25) attended the Nano Jatha Lecture Series, Roadshow, and Exhibition held at BITS Pilani, K K Birla Goa Campus

Tree Plantation Drive

St. Xavier's College, Mapusa, witnessed a spirited sapling plantation drive which aimed at promoting environmental sustainability and raising awareness about the importance of greening the campus. The event organised in partnership with Vianaar Homes was a collaborative effort by the college's NSS unit and the Department of Biotechnology which celebrates its 20th year of establishment. Together, they successfully planted 150 saplings, including a variety of fruit and flowering trees.

The drive attracted enthusiastic participation from NSS volunteers, Biotechnology students, faculty members, and the college's Principal and Administrator. Mr. Sangam, Sustainability Manager at Vianaar Homes, in his address, highlighted the significance of planting saplings within college campuses. A touching moment in the event was the "Plant4Mother" campaign, where each sapling was dedicated to the students' mothers. Mr. Amit Vernekar, Biotechnology student honored his mother, Namita Vernekar, with his dedication.

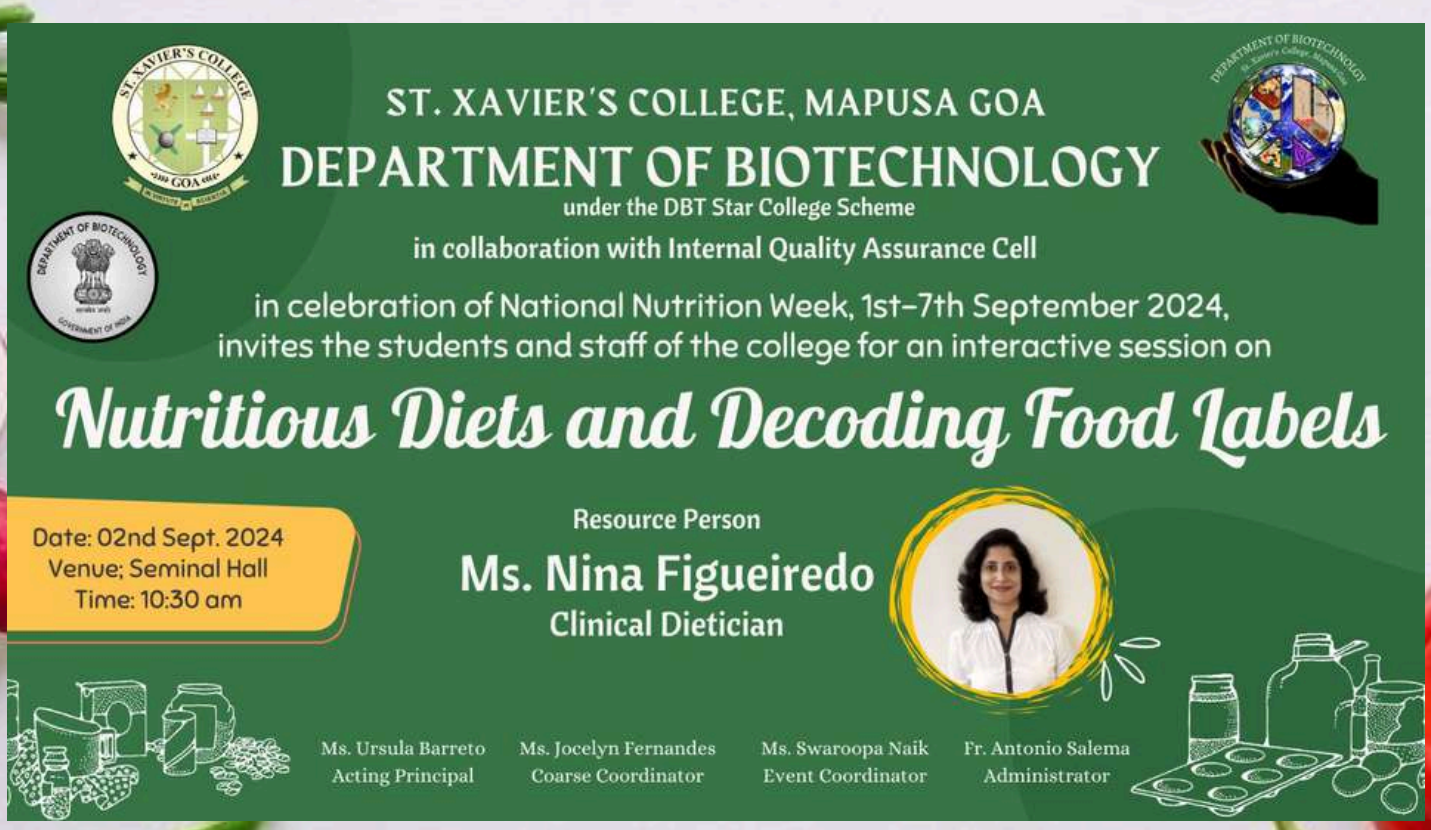
The event's success was due in no small part to the college gardener Mr. Satish, whose diligent efforts in preparing the pits and assisting with the planting were greatly appreciated.

Nutritious Diets and Decoding Food Labels

The Department of Biotechnology of St. Xavier's College, Mapusa-Goa celebrated the National Nutrition Week from 1st September to 7th September 2024. On 2nd September 2024, the Department of Biotechnology, in collaboration with the Internal Quality Assurance Cell, under the DBT Star College Scheme, organized an interactive session on the topic ***"Nutritious Diets and Decoding Food Labels"*** for students as well as faculty members. The significance of this program was to spread awareness and education on dietary changes and promotion of healthy lifestyles. The resource person rendering the talk was Ms Nina Figueiredo, a Clinical Dietician.

Ms. Nina initiated an interactive session with the audience wherein she discussed the different essential nutrients and their sources, suggested various diet plans one could follow, the minerals, proteins, vitamins which are beneficial for our health; proper consumption of these minerals; the importance of checking the food labels. The session highlighted the significance of proper sleep, proper intake of water and exercise.

Overall, the session was informative, proactive, and well-received by the students, keeping them engaged until the end.




DEPARTMENT OF BIOTECHNOLOGY
Nutritious Diets and Decoding Food Labels
ST. XAVIER'S COLLEGE
GOA
IN VERITATE SCIENTIA


ST. XAVIER'S COLLEGE, MAPUSA GOA
DEPARTMENT OF BIOTECHNOLOGY
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Poster competition

As part of National Nutrition Week, the Department of Biotechnology organized a poster competition open to students from various departments on the theme **"Snacking Done Right: Smart and Healthy Choices to Curb Cravings!"** on 3rd September 2024. A total of nine students participated from various departments, showcasing their creativity and knowledge on making healthier snack choices. The competition was judged by Mrs. Mamta Prabhugaonkar, Assistant professor from the Department of Chemistry (P.G.), Mr. Vipul Parsekar, Assistant professor from the Department of B.C.A., and Ms. Giann Fernandes from the Department of English. Poonam Palyekar (S.Y. B.A) secured first place, followed by Suhani Shetye (F.Y.B.Sc. Biotechnology) in second place, and Jyoti Jadhav (S.Y B.Sc. Biotechnology) in third place. The objective of this competition was to highlight the importance of making nutritious choices in daily snacking habits.

Cook Off

In view of the celebration of National Nutrition week, the Department of Biotechnology organised a Cooking competition on the theme: ***"Superfoods - Nutrition power houses"***. The objective of this competition was to bring together students and staff to showcase their culinary talents and highlight the various superfoods. The event was a fantastic blend of creativity, health-conscious cooking, and community spirit. A total of 12 participants participated in this competition. The competition was judged by Ms. Arina Frank Assistant Professor in Microbiology, Dr. Carmelita D'Mello Associate Professor in Commerce and Dr. Mira Parmekar Assistant Professor in Chemistry.

The winners were as follows:

First Place: Lynn Vaz, F.Y. B.Sc Biotechnology

Second Place: Ruth Aguiar, T.Y. B.Sc Biotechnology

Demystifying Nutrition for Sports and Fitness Enthusiasts – Protein and Dietary supplements

The Department of Biotechnology of St. Xavier's College, Mapusa-Goa celebrated the National Nutrition Week from 1st September to 7th September 2024. On 4th September 2024, the Department of Biotechnology, in collaboration with the Department of Physical Education and Sports and Internal Quality Assurance Cell, under the DBT Star College Scheme, organized a session on the topic **"Demystifying nutrition for sports and fitness enthusiasts – protein and dietary supplements."** The guest speaker for the day was Ms. Andrea Fernandes, Head dietitian, EndoHeal.

Ms. Andrea Fernandes emphasized the importance of protein in the diet. She highlighted that individuals involved in sports or regular exercise require more protein and described how to accurately determine individual protein needs. Ms. Andrea shared detailed insights on supplements and stressed the significance of maintaining a balanced, wholesome diet to improve overall health.

Overall, the session was informative, proactive, and well-received by the students, keeping them engaged until the end.


Department of Biotechnology
is organizing a session under the
DBT Star College Scheme
in collaboration with
Department of Physical Education and Sports
& Internal Quality Assurance Cell

First Responder Training

In celebration of World First Aid Day, 14th September 2024, the Department of Biotechnology, in collaboration with EMRI Green Health Service and in association with the Director of Health Service (DHS), organized a one-day workshop on ***"First Responder Training"*** for students and faculty members of St. Xavier's College, Mapusa on 13th September 2024.

The resource persons for the workshop were Mr. Sateesh Kumar Kama (Training Head), Mr. Vinod Jadhav (Clinical instructor), Miss Pooja Mohite (Clinical instructor), Mrs Chaitali Gauns (Clinical instructor) and Mr Khema Gaonkar (Support staff).

Participants gained hands-on experience in CPR, first aid response and treatment to accidental injuries, animal bites, and understanding the crucial role of a first responder in emergency situations.

This workshop emphasized the importance of being prepared in emergency situations and empowering participants with essential life-saving skills.


First Responder Training


CBERT
Community Based Emergency Responder Training


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Field Trip to BITS Pilani

On 25th September, the Department of Biotechnology organized an educational field trip for S.Y and T.Y students to the BITS Pilani, Goa Campus. The primary objective of this visit was to provide students with valuable insights into the cutting-edge research being conducted at the institute and to witness demonstrations of various advanced analytical instruments.

The primary objective of this visit was to provide students with valuable insights into the cutting-edge research being conducted at the institute and to witness demonstrations of various advanced analytical instruments. Professor Tusar Saha, a distinguished faculty member of BITS Pilani, provided an overview of the institute's infrastructure, faculty, and research activities. Mr. Paraj Kamat, a Technical Assistant at BITS Pilani, guided the students through five department laboratories. Each laboratory visit involved demonstrations of advanced analytical instruments commonly used in ongoing research. The students visited the Faecal Sludge Management Lab, Waste Water Management Lab, the Biosafety Facility, Departmental Laboratories, and the Greenhouse. Research scholars working in these laboratories shared their ongoing research projects, discussing both their research findings and their experiences in the field. This field trip provided an enriching experience for the students, allowing them to witness the integration of advanced technology in biotechnology research and gaining exposure to real-world laboratory environments. The visit also offered networking opportunities with researchers, potentially inspiring future collaborations.

Class of S.Y.BSc and T.Y.BSc Biotech (2024-25)

Transect Walk and Nursery Visit

The Department of Biotechnology organised a transect walk to Dr. Ram Manohar Lohia Garden, Mapusa on 30th September 2024. This visit was a part of the practical curriculum of the Skill Enhancement Course paper titled “Modern Agricultural Practices and Home Gardening”.

A total of 21 students of Second Year Biotechnology participated in this field visit. As a faculty member, Ms. Emma Fernandes accompanied the students to ensure the guidance and safety throughout.

The objective of this transect walk was to understand the role of plants in the community.

Students of S.Y.BSc Biotech (2024-25)

Field Trip to Goa Dairy

On October 4th 2024, the students of TY Biotechnology of St. Xavier's College embarked on a field trip to Goa Dairy in Ponda. The primary objective of this visit was to observe and study processes involved in milk production, packaging and quality control.

Mr. Uday, the QCO, briefly explained the processes involved at the plant. In the quality control laboratory, physical tests, such as checking the colour and smell, are performed to assess the milk's sensory attributes. Chemical tests, including the Gerber test and the CLR method, are used to determine the fat content and overall quality of the milk. Microbiological tests, such as the MBRT and phosphatase tests, are carried out to ensure the absence of harmful bacteria. The dairy plant also maintains stringent hygiene standards, implementing regular cleaning procedures and adhering to FDA regulations.

The field trip to Goa Dairy provided us with a valuable opportunity to understand the complex processes involved in milk production and quality assurance. This experience has enhanced our understanding of the dairy industry and its contribution to the local economy.

Class of T.Y.BSc Biotech (2024-25)

Trash to Treasure

As part of Green Initiatives and Environment Monitoring Cell, a competition titled “Make your Trash to Treasure” was held on 10th October 2024 in the Biotechnology Laboratory 3 and the participants were first year biotechnology students. The participants were 30 in number and were divided into 5 groups. The students were encouraged to think outside the box and submit their entries. Group 1 used plastic and paper as trash from their homes and created a flower vase. Group 2 used glass bottles and hand painted them to convert them into beautiful mementos. Group 3 used plastic and wine bottles and painted them and added a light element into it creating it into a night lamp. Group 4 used lids of plastic pet bottles and decorated them with yarn to create a wall hanging. Lastly Group 5 created a hologram using cardboard box and demonstrated the use of it.

The event was judged by Ms. Sonali Kajoli, Ms. Emma Fernandes and Ms. Jocelyn Fernandes. Group 4 and Group 3 won the first place, Group 2 won the second place, and the third place was bagged by Group 1 and Group 5. The students were enthusiastic and happy for their participation and looked forward to more of such events in future.

In conclusion, the “Trash to Treasure” movement is more than just a creative outlet; it embodies a shift in mindset towards sustainability and resourcefulness. By reimagining waste, we not only protect the planet but also unleash our creativity, proving that beauty and value can be found in the most unexpected places.


Group 4


Group 3


Group 2


Group 5


Group 1
24

Field Trip to Sewage Treatment Plant

The class of F.Y. B.Sc. Biotechnology on 14th October 2024 visited a sewage treatment Plant in Santa Inez, Panjim.

The main objective for this visit was to gain practical knowledge about the water treatment plant process and various units of a STP. The guide for the day was an engineer who worked at that sewage treatment plant. He explained how the sewage treatment plant works.This visit provided students with invaluable practical knowledge about the wastewater treatment process and the various components involved in the operation of the sewage treatment plant. Students gained a comprehensive understanding of how wastewater is treated, emphasizing the importance of such facilities in maintaining public health and environmental sustainability.

Students of F.Y.BSc Biotech (2024-25)

Drosophila melanogaster: Cinderella of Genetics

Attending the 7-days hands-on workshop on "Using Drosophila melanogaster for Biology Laboratory Classes" was nothing short of a transformative experience for me. Organized by the DBT-sponsored Centre for Training Teachers in *Drosophila melanogaster* for Biology Laboratories, Department of Zoology, Banaras Hindu University, and held at IISER Pune from the 24th to the 30th December 2024 The workshop opened my eyes to the incredible potential of this tiny fruit fly—the Cinderella of genetics.

From the moment I stepped into the state-of-the-art facilities at IISER Pune, I knew I was in for something special. The workshop's aim was clear: to bridge the gap between theoretical knowledge and practical application in the teaching of biology. As a student & now as college teacher, I have always been intrigued by the simplicity & versatility of *Drosophila melanogaster* as a model organism. But this workshop took my understanding to an entirely new level.

Our resource persons Prof. S. C. Lakhotia, Dr. Richa Arya, Dr. Bama Charan Mondal & Prof. Girish Ratnaparkhi guided us through an incredible array of techniques and methodologies. I remember the first day vividly—we began with the basics, learning how to maintain Drosophila in different stages of life cycle. It felt like stepping into a new world as I prepared culture media and learned the tricks to prevent contamination. Who knew such a tiny organism required such precise care?

As the days progressed, I found myself completely engrossed. One session that stood out to me was about identifying different species of Drosophila. Armed with a magnifying glass and a heap of patience, I learned to distinguish between species based on their physical characteristics. It was like solving a fascinating puzzle, & every successful identification felt like a small victory.

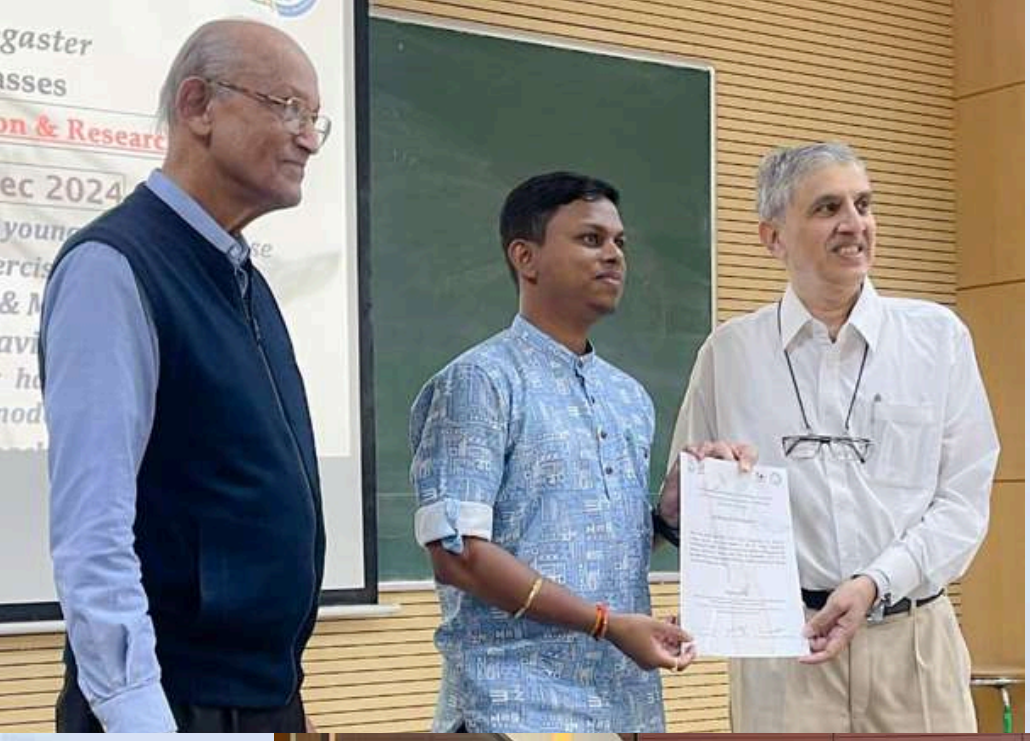
The dissection sessions, however, were where I truly felt the magic of biology come alive. Holding those delicate flies & observing their internal structures under a microscope was an awe-inspiring experience. I was especially fascinated by the demonstration on gut pH levels & the observation of polytene & mitotic chromosomes. It's one thing to read about these concepts in a textbook, but seeing them unfold right in front of my eyes was a completely different story.

Another unforgettable aspect was exploring Drosophila's behavioral traits. Watching their olfactory responses & studying their epileptic behaviors under controlled conditions gave me a new appreciation for their role in understanding neurological & behavioral biology. These little creatures truly are the unsung heroes of genetics, providing invaluable insights into complex biological processes.

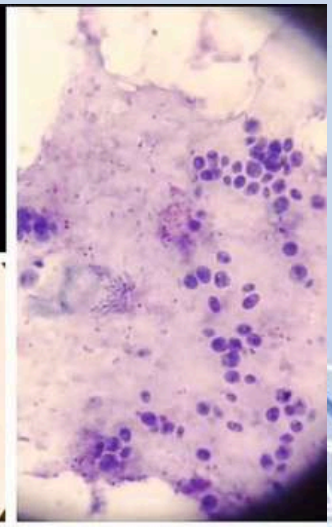
By the end of the week, I felt a profound sense of accomplishment. The hands-on approach of the workshop had given me not just knowledge but the confidence to implement these techniques in my own teaching. I could already envision my students' excitement as they delve into experiments with Drosophila, unravelling the secrets of genetics & beyond. The workshop wasn't just about learning techniques; it was about kindling a curiosity & respect for the intricate world of genetics.

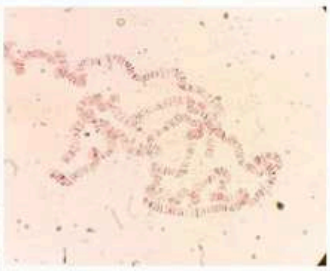
Drosophila melanogaster may be small, but it holds immense power in its wings—a true Cinderella of genetics. And as I left the workshop, I knew that my journey with this remarkable organism was only just beginning.

-Mr. Vishal U. Mardolkar
Faculty




Indian Institute of
Science Education &
Research Pune





The Master class series session on Alternate structures of RNA and their Functional significance

The Directorate of Higher Education, as part of its Master Class Series, hosted an exclusive research seminar, for researchers in the field of Bio-organic science, bringing together distinguished academicians, scholars, and students from various institutions across Goa. This highly anticipated event featured Professor Victoria D'Souza, a renowned Professor of Molecular and Cellular Biology at Harvard University, as the keynote speaker.

Professor Victoria D'Souza delivered an insightful talk on "Alternate Structures in RNA and Their Functional Significance," shedding light on groundbreaking developments in RNA biology. The session focused on her area of research: HIV-1 Reverse Transcription Initiation Mechanisms. Professor D'Souza elaborated on the complex mechanisms by which HIV-1 initiates reverse transcription and its profound implications on DNA synthesis. The discussion highlighted recent advancements in understanding viral replication strategies, which could pave the way for innovative therapeutic approaches. The session provided an in-depth analysis of RNA's structural dynamics and its functional implications in both viral replication and developmental biology. It fostered discussions on potential applications of this knowledge in biomedical research, particularly in the development of antiviral strategies and genetic regulation. Attendees had the opportunity to engage with Professor D'Souza through an interactive Q&A session, enriching their understanding of molecular biology and its evolving paradigms.

The Master Class proved to be a valuable platform for researchers and students, offering them a unique opportunity to gain insights from an expert in the field of Molecular and Cell Biology. I express my appreciation to the Directorate of Higher Education for organizing such an intellectually stimulating and inspiring session.

~Ms. Jocelyn Fernandes
Course Coordinator

LCMS workshop on Mass Spectrometry for Proteomics

Ms. Jocelyn Fernandes, Assistant Professor from the Department of Biotechnology, participated in a three-day workshop organized by CSIR-National Institute of Oceanography (CSIR-NIO), Goa, from 29th to 31st January 2025. The event commenced with an inaugural session by Dr. Rakhee Khandeparker, emphasizing the significance of mass spectrometry in proteomics. Dr. Samir Damare led the first day with sessions on the basics and technical aspects of LCMS Q-Tof, including calibration techniques for large and small molecules, operational modes, and qualitative analysis workflows. The day concluded with a live demonstration of instrument setup.

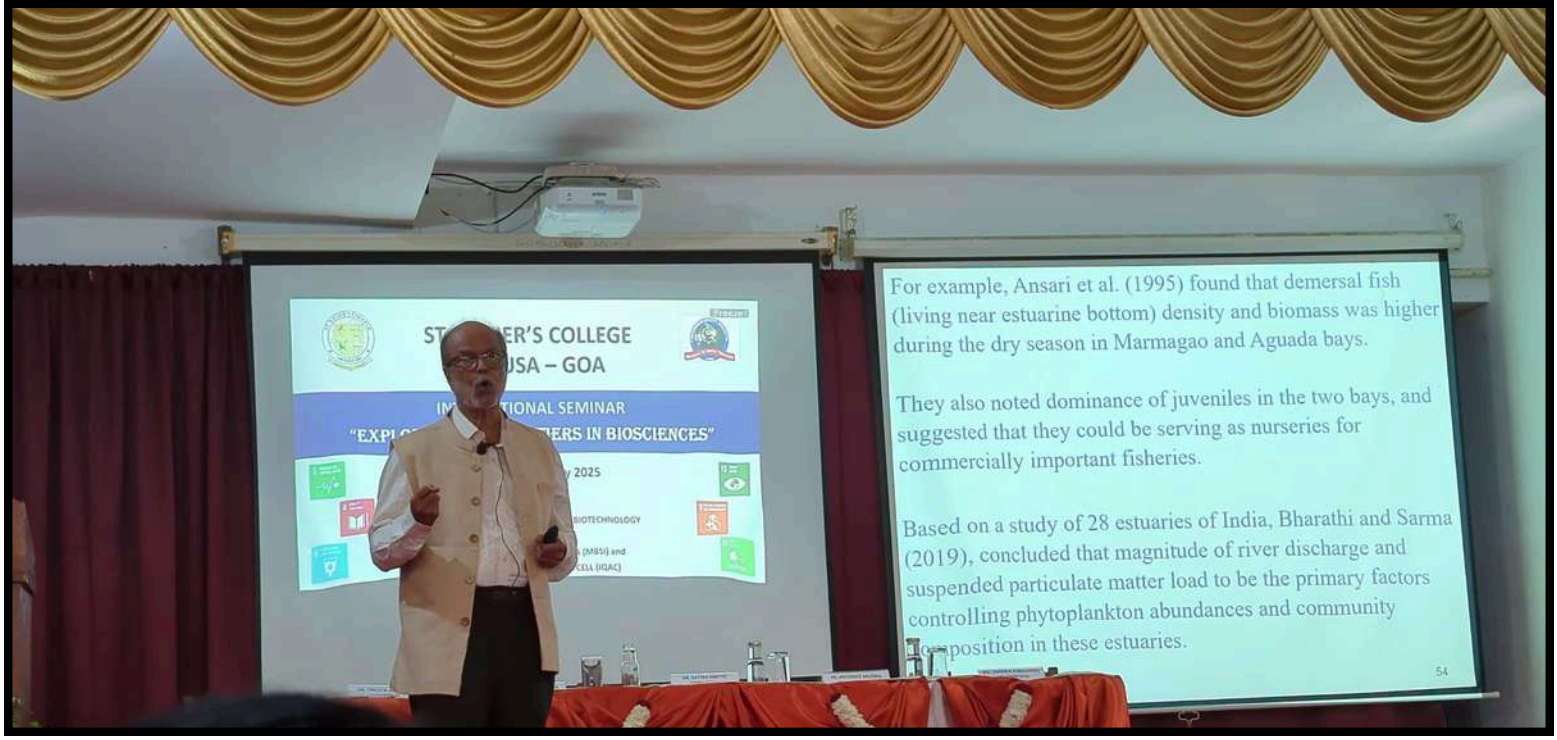
On the second day, participants explored large molecule workflows and identification techniques for proteomic samples, gaining valuable insights into the analysis of complex biological materials. The afternoon sessions offered hands-on training in peptide mapping and sample processing, supervised by Dr. Damare and his team, enhancing the participants' understanding of real-world applications and laboratory protocols.

The final day covered data analysis using Mass Profiler Professional (MPP), followed by a practical session on sample preparation techniques. A guest expert from BITS-Pilani, Goa, presented real-world proteomics applications. The workshop ended with an interactive quiz and a valedictory session. Overall, the workshop proved to be a highly informative and skill-enhancing experience for all attendees.

~Ms. Jocelyn Fernandes
Course Coordinator

International Seminar - "Exploring New Frontiers in Biosciences"

The Departments of Biotechnology and Microbiology, St. Xavier's College, in collaboration with the Microbiologists' Society, India (MBSI) and Internal Quality Assurance Cell (IQAC) organised an international seminar on "Exploring New Frontiers in Biosciences". The aim of the seminar was to provide a comprehensive platform for eminent scientists, academicians, industry personnel, research scholars, and students to come together and discuss emerging trends, innovative breakthroughs, cutting-edge technologies, and interdisciplinary approaches in science and technology. Dr. Satish Shetye was The Chief Guest at the inaugural function and applauded St. Xavier's College for always being progressive. Rev. Fr. Antonio Salema welcomed the delegates and spoke of the seminar as a platform that brought leading experts, scholars, and professionals in the field of Biosciences together to share knowledge, discuss recent advancements, and explore new frontiers in this dynamic and ever-evolving discipline. Ms. Ursula Barreto highlighted the seminar's significance in fostering interdisciplinary collaborations. Dr. Trelita de Sousa conveyed that the seminar was aligned with the United Nation's Sustainable Development Goals (SDGs) which provided a blueprint to address planetary challenges like the emergence of infectious diseases, climate change, and biodiversity loss.The seminar garnered the participation of over 200 participants from all across the globe including Australia, Germany, India, U.K., and U.S. The participants presented their novel ideas and exciting research through vivid scientific posters and interactive oral presentations. Ms Florence Pereira from Kingston University, London bagged the Best Poster Presentation and Ms. Yuga Ghotge from BITS Pilani, Goa won Best Oral Presentation. It culminated in a short cultural programme by the students of St. Xavier's College, Goa showcasing the vibrant Indo-Portuguese heritage of the State. Outcomes - The seminar was an enriching learning experience for all the participants allowing innovative deliberations for sustainable research in Biosciences.


For example, Ansari et al. (1995) found that demersal fish (living near estuarine bottom) density and biomass was higher during the dry season in Marmagao and Aguada bays.
They also noted dominance of juveniles in the two bays, and suggested that they could be serving as nurseries for commercially important fisheries.
Based on a study of 28 estuaries of India, Bharathi and Sarma (2019), concluded that magnitude of river discharge and suspended particulate matter load to be the primary factors controlling phytoplankton abundances and community composition in these estuaries.
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INTERNATIONAL SEMINAR
GPS Map Camera


GPS Map Camera


ST. XAVIER'S COLLEGE
MAPUSA – GOA
INTERNATIONAL SEMINAR
'EXPLORING NEW FRONTIERS IN BIOSCIENCES'
GPS
Mapusa, Goa, India
St. Xavier's College, near Dangui Colony,
Lat 15.597937° Long 73.807944°
23/01/25 12:51 PM GMT +05:30
Google


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Achievements

Outstanding Performers of Batch 2023-2024

Ms. Rudali Salkar

Mr. Atharv K. Kamat

Ms. Lenina Pareira

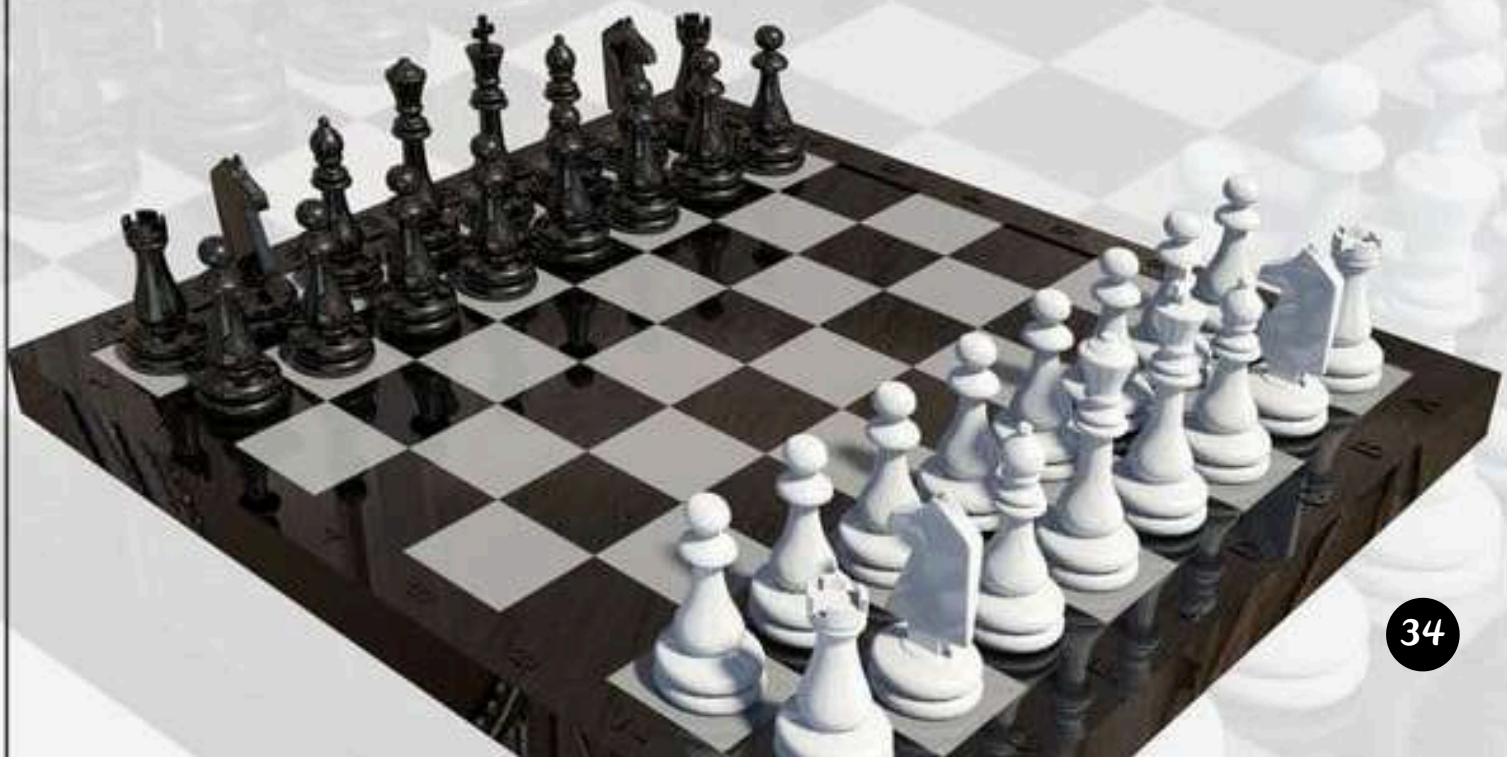
Ms. Saneeya Kalangutkar

Inter-collegiate event

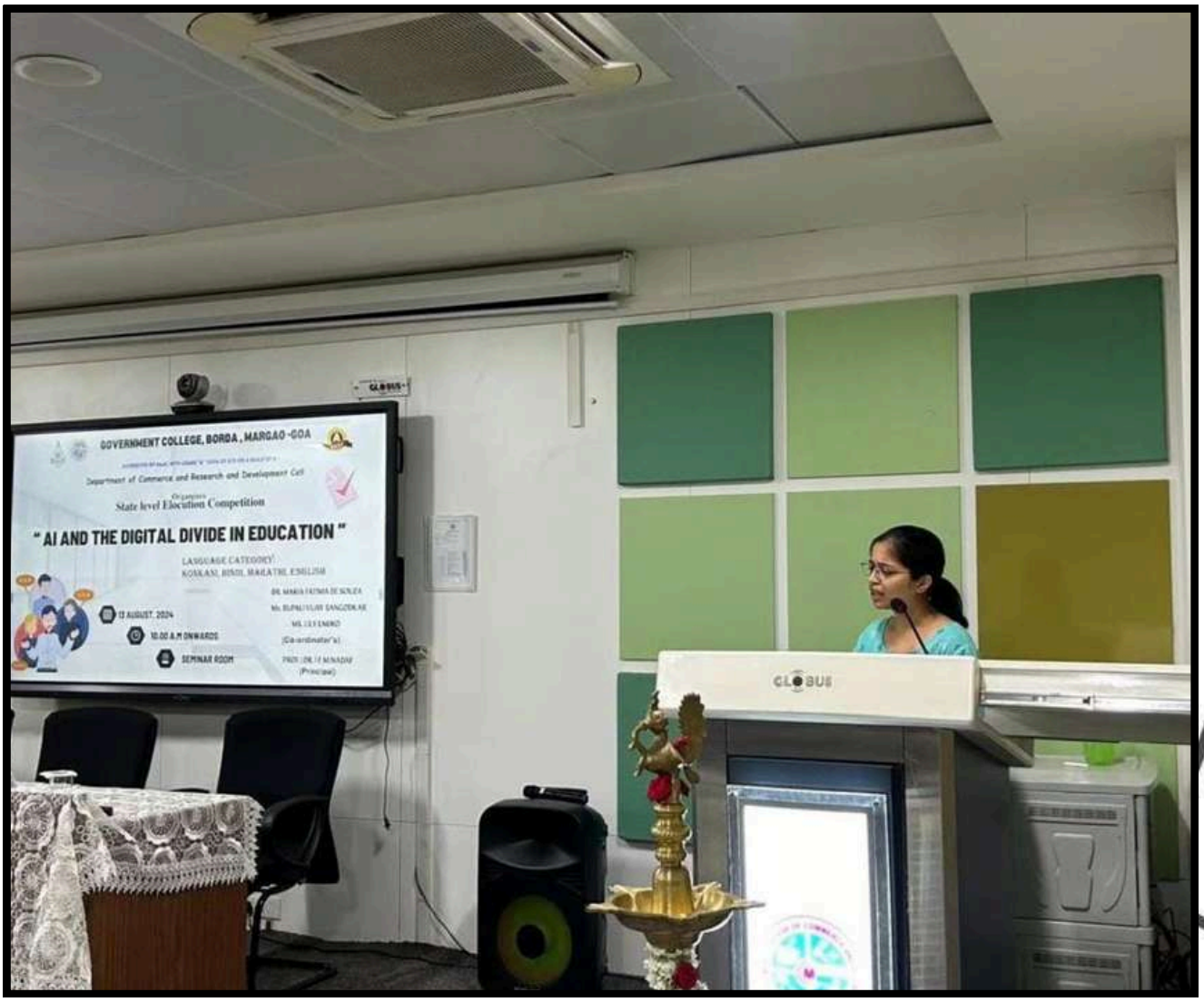
The students became the runners-up of “Eremos 2024” organized by the Department of Zoology, Carmel College of Arts, Science and Commerce for Women Nuvem in collaboration with Goa Forest Department, Wildlife and Ecotourism, South Goa Division Margao on 13th March 2024.

Interclass Chess Tournament

Ms. Vrunda Naik (T.Y.B.Sc 2024-25) was the runner-up
Mr. Shreyash Gawas (S.Y.B.Sc 2024-25) was the semifinalist



State Level Elocution Competition



Ms. Vedika Marathe (F.Y.B.Sc 2024-25) secured the First Place in the State Level Elocution Competition organized by Government College of Commerce and Economics, Margao-Goa on the topic “AI and the Digital Divide in Education” in Marathi language category on 13th August 2024.

Inter-collegiate Staff Badminton Tournament

Ms. Emma Fernandes, Assistant Professor in Department of Biotechnology emerged Champion in Women singles Badminton tournament and also won the Best Player award at the First Inter-Collegiate Staff Badminton Tournament, organized by Ravi S. Naik College of Arts and Science in collaboration with Rajaram and Tarabai Bandekar College of Pharmacy, Farmagudi on 30th and 31st August 2024.

Annual Training Camp

Ms. Abhidnya Sawant

Ms. Deepisha Mandrekar

Ms. Pooja Lamani

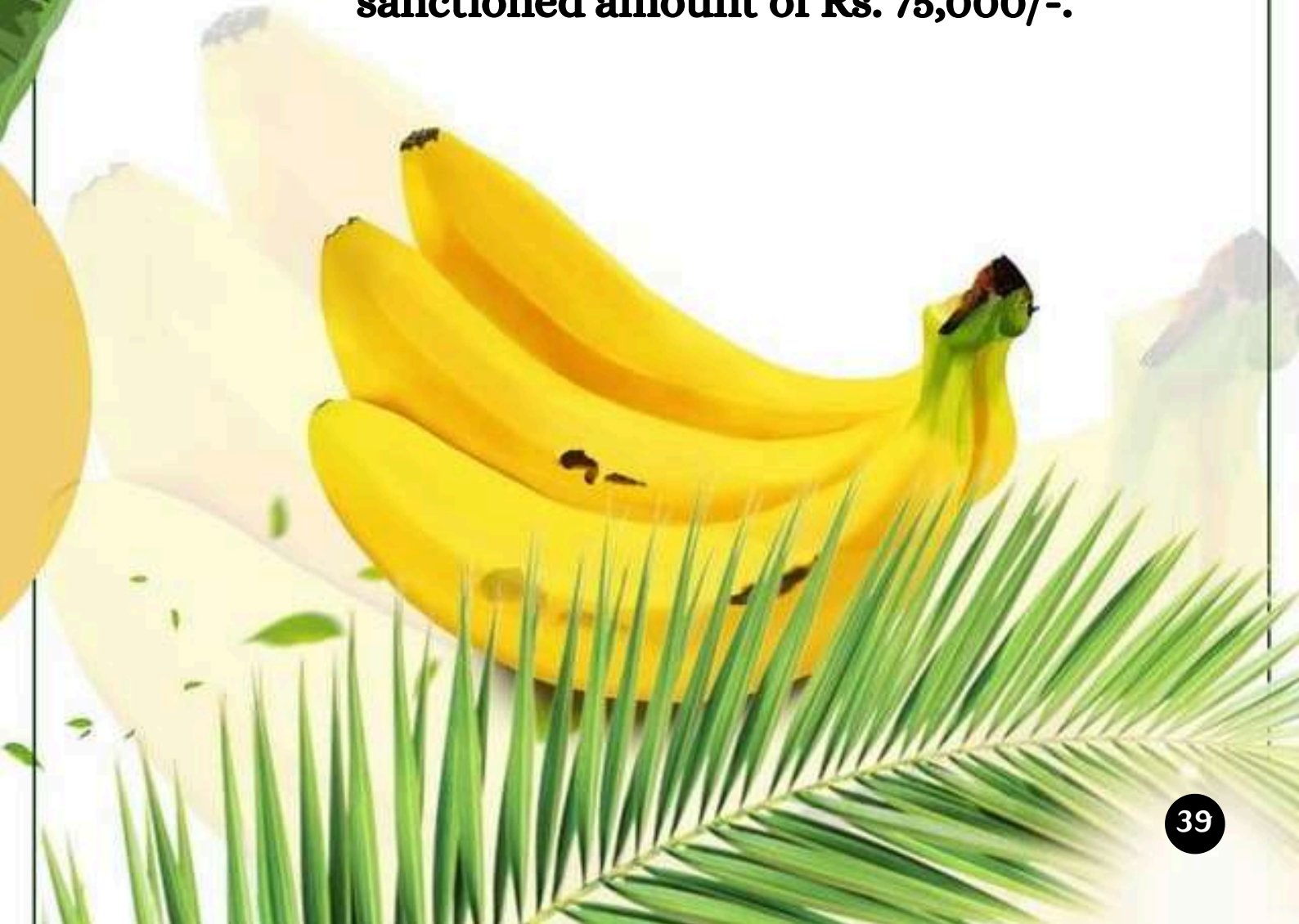
Students of S.Y.B.Sc. successfully completed the Annual Training Camp organized by 1 Goa Girls BN NCC from 3rd-12th December 2024.

'Vandana' Choir Concert

Auxiliary Bishop Simiao Fernandes felicitated Ms. Aloma Saldanha (S.Y.B.Sc.) for successfully training and conducting the choir concert. 'Vandana- Immersed in Grace', organised by the AICUF Cell of the college.

Projects Granted

Ms. Jocelyn Fernandes and Ms. Lakshmi Swaroopa Naik, appointed as CO-PIs for the study 'Tissue Culture of Goa GI Moira Banana (Myndoli Kellin in Konkani)', under DST-PURSE-GRACE-Hand Holding and Start-up Scheme (2023-2024), with Dr. Andrew D'souza (Department of Chemistry) as the PI, with a sanctioned amount of Rs. 75,000/-.

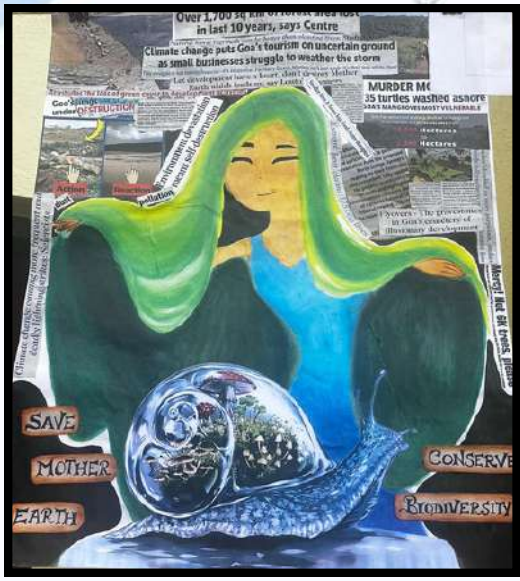


Gallery

Xavier's Open Lab Day

St. Xavier's College, Mapusa, under the DBT star college scheme organized a one-day event "Open Lab day" for the Schools across Goa on the occasion of National Science Day .

Save Mother Earth, Conserve Biodiversity



Students of F.Y.BSc, S.Y.BSc and T.Y.BSc Biotech participated in the poster competition on the theme "Save Mother Earth, Conserve Biodiversity" on 15th August 2024

Small acts, big impact!

The students of F.Y.BSc Biotechnology students participated in the skit on the occasion of Sadbhavana Diwas on 21st August 2024. The day was dedicated to fostering peace, unity and harmony among all sections of our society

Quiz it up!

Ms. Alethea Fernandes (S.Y.BSc) and Ms. Aloma Saldanha (S.Y.BSc) participated in "INE Health-O-Quiz", an Inter-Collegiate Quiz Competition organized by Institute of Nursing Education, Bambolim-Goa on 24th August 2024.

Radiance on Eight Legs: When Nature Paints a Neon Kaleidoscope in the Wild

Photograph Captured by Ms. Ruth Blessica Aguiar
(T.Y.BSc 2024-25)

From trash to habitat: Marine organisms making the best of human waste.graph text

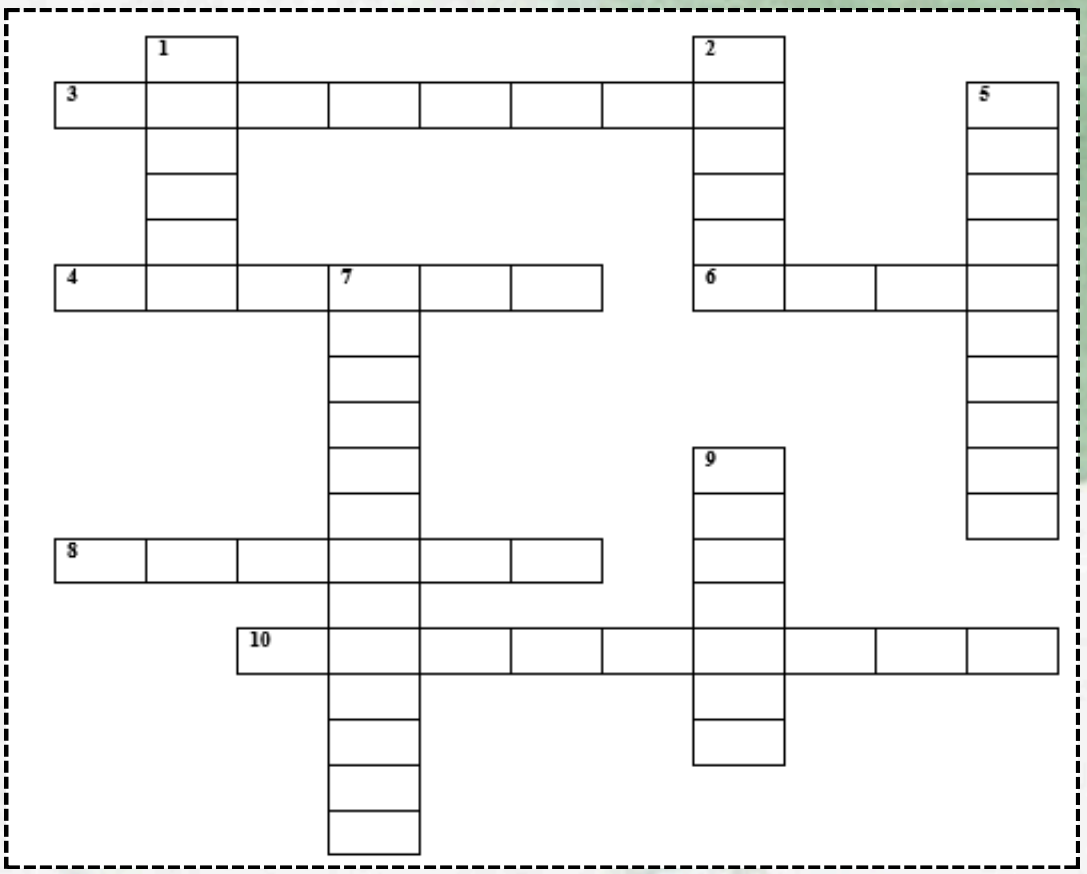
Photograph Captured by Ms. Kimberly D'Costa
(T.Y.BSc 2024-25)

Art in its rawest form

Sketches by Mr. Jaiden Dias

(F.Y.BSc 2024-25)

Test your Biotechnology knowledge



DOWN:

1 . Enzyme that joins DNA fragments by forming phosphodiester bonds.
2. The complete set of genetic material within an organism, including both coding and non-coding regions.
5. Scientific study of the immune system and its functions in health and disease.
7. The process of synthesizing RNA from a DNA template.
9. Polysaccharide used as a gel matrix in electrophoresis to separate DNA fragments.

ACROSS:

3. Organelle responsible for protein synthesis, composed of RNA and proteins.
4. Carrier used to transfer genetic material into a host cell, such as a plasmid or virus.
6. Coding segment of DNA that is transcribed into mRNA and translated into protein.
8. Non-coding segment of DNA that is removed during RNA splicing.
10. Programmed cell death essential for development and maintaining cellular balance.

Contributed by
Mr. Amit Vernekar
(T.Y.BSc 2024-25)

Find the words

Y	E	N	T	A	G	N	G	O	R	S	G	N	R	E
I	G	X	O	K	G	B	E	N	P	E	Z	E	T	S
M	V	O	O	I	W	F	O	G	S	M	S	I	C	O
M	N	T	L	N	T	R	V	A	I	T	G	I	K	R
U	E	O	V	O	T	P	G	E	R	T	M	Z	M	A
N	M	E	I	N	N	I	I	I	C	O	N	W	I	G
O	O	M	I	T	L	H	C	R	E	T	A	A	C	A
L	N	Y	P	V	A	T	C	T	C	P	O	O	R	N
O	E	Z	C	E	I	T	O	E	O	S	D	R	O	E
G	G	N	R	O	Q	R	N	P	T	O	N	R	B	G
Y	S	E	N	G	P	F	T	E	N	O	C	A	E	O
L	C	H	R	O	M	O	S	O	M	E	I	W	R	H
J	S	D	I	M	S	A	L	P	M	R	S	B	G	T
H	Y	B	R	I	D	O	M	A	N	N	E	H	E	A
B	O	O	S	C	I	H	T	E	O	I	B	F	B	P

Agarose
Antigen
Apoptosis
Bioethics
Biotechnology
Chromosome
Codon
CRISPR
Enzyme
Exon
Fermentation
Genome
Hybridoma
Immunology
Intron
Ligase
Microbe
Pathogen
PCR
Plasmid
Proteomics
Restriction
Transcription
Vector

Contributed by
Mr. Amit Vernekar
(T.Y.BSc 2024-25)

Incredible Journey of Our Department and its Alumni

To my beloved Biotech family at St. Xavier's College, As I look back on my undergraduate journey, I'm filled with nostalgia and gratitude. Our faculty were more than just teachers- they were mentors, guides and friends. I am especially grateful to Miss Jocelyn, Miss Anjelica, Miss Anabel, and Miss Jenica who went above and beyond to ensure our academic success and personal growth. I am grateful for the numerous opportunities they provided us from internships and research projects to workshops and seminars. They instilled in us a love for learning, curiosity and passion for making a difference. The Biotech department at St. Xavier's will always hold a special place in my heart. The memories created here will be treasured forever. Thank you for being an integral part of my journey. May the Biotech department continue to inspire and nurture future generations! With love & gratitude.

~Ms. Jija Rane
Batch: 2017-2020

I admire and cherish the three years spent at St Xavier's College as part of my education. It has not only shaped me in my academic excellence but also, those years have ingrained great values in my personal development. I always looked up to the teaching staff and I'm grateful to them for being a mentor, a guide and for instilling discipline in us. Today, where I am in my life and the way I present myself, is certainly a result of what I have observed and learnt from the respective department. Furthermore, my batchmates were super supportive. It was truly amazing working alongside them and establishing positive friendships. I will always treasure my experience at St Xavier's College. I thank the department for their constant support and guidance. Thank you!!

~Ms. Alaika Dsouza
Batch: 2018-2021

Department of Biotechnology

Faculty

Ms. Jocelyn V. Fernandes (Co-ordinator)

Ms. Lakshmi Swaroopa Naik

Mr. Vishal U. Mardolkar

Ms. Anjelica Matias

Ms. Sonali E. Kajoli

Ms. Emma Fernandes

Ms. Jenica T. Rangel

Mr. Kamlesh Korgaonkar

Laboratory Staff

Ms. Sneha Mangaonkar (Laboratory Assistant)

Mr. Francisco Colaco (Laboratory Attendant)