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Semester - I notes 2021-22

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K K Birla Goa Campus

BITS Pilani
K K Birla Goa Campus

innovate achieve lead

from the editor

Dear Readers,

We are pleased to present to you the 24th Issue of BITSCAN magazine.

All of us are gradually returning to normalcy. Though situation is much better, we continue to keep our fingers crossed. Almost all adults in the campus are fully vaccinated, and awaiting announcements for the booster dose by the authorities. Now, it is up to us to shoulder the responsibility of not inconveniencing the others. Restrictions are being steadily relaxed, students are allowed to return to campus after a long gap and will soon attend classes, labs, etc. in a hybrid / offline mode. Till now the Institute carried its activities, including lectures and seminars, in the virtual mode with very limited interactions in physical formats.

During this semester too, BITS BIRAC BioNEST continued with some very interesting series of activities – some held in hybrid mode. Visits by Vice-Consul of Royal Thai Consulate and the Attaché for Scientific and Academic Cooperation of Embassy of France in India were much appreciated in taking the collaboration forward. Eminent speakers from India and abroad delivered lectures / webinars for our students and faculty members. 11 very significant research projects worth around Rs. 1.9 crores were sanctioned for various departments by government and non-government agencies during this semester.

In addition to fulfilling teaching and research assignments, our faculty members were engaged in various initiatives including delivering invited lectures and conducting workshops at other institutions, presenting papers on their latest research at national and international events. Many faculty members are appointed on editorial boards and to review reputed international and national journals. Due to ongoing COVID-19 restrictions, almost all these activities had to be held virtually.

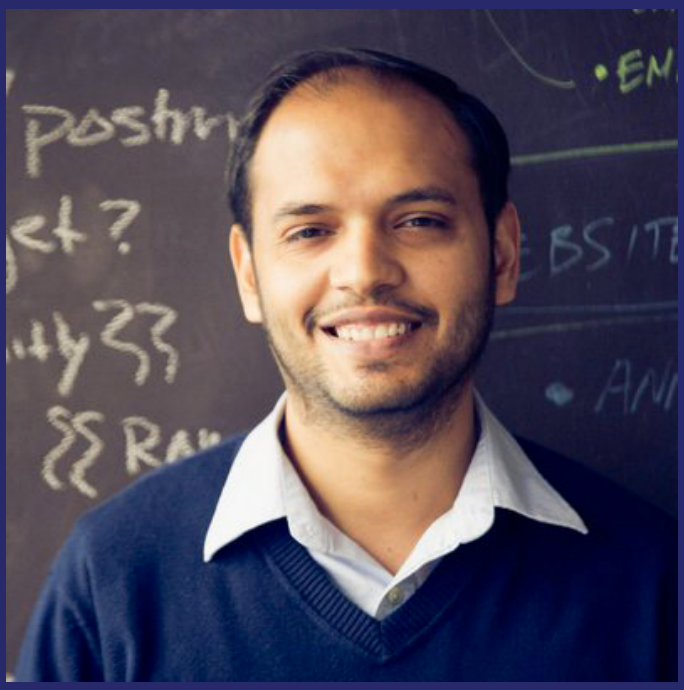
Our students continue to win accolades in India as well as abroad and make us proud. Team of Project Kratos which aspires to develop a Mars Rovers equipped with advanced subsystems suitable for interplanetary deep space missions has scaled new heights. The team is very confident of qualifying to participate in the finals of University Rover Challenge 2022 to be held in the USA. From securing scholarships of national and international institutions, to winning Asia's largest management symposium - the Red Bricks Summit, from participating and winning significant hackathons, to winning some very prestigious paper presentation awards, and winning quiz and essay competitions, students are shinning and making their alma mater proud of their achievements. Between June 2021 to January 2022, 14 startups founded / co-founded by students/ alumni of BITS Pilani, K K Birla Goa Campus raised over 2.6 billion USD funding from different sources. Of these 8 startups founded in 2020 & 2021 raised over 13.5 million USD.

On 30th October 2021, Prof. G Raghurama completed his five-year tenure as the Director of our campus. He was given a very affectionate and reluctant farewell by the BITS family, where he served for the last 34 years. He announced that he will join Dehradun Institute of Technology University (DITU) as its Vice Chancellor. He had shifted to Goa Campus in 2015 after completing his tenure as Director of Pilani Campus. Design and implementation of the fully computer based Online test BITSAT for admission to BITS, which has become a benchmark in Online testing in India is one of his most remarkable contributions at BITS. BITS wishes him all the very best in his future endeavors.

We thank the entire BITS community for their contributions and support in bringing out this issue of BITSCAN.

From BITS Goa to building a unicorn

Postman is now the world's leading API platform. It offers a platform for developers or enterprises to build, test, and debug their APIs. In July of 2021, Postman joined the unicorn club after raising $150 million in a Series C round.
We, as BITSians, must be immensely proud as this fleet was achieved by one of our own. Mr. Abhinav Asthana, the co-founder and CEO of Postman, was a 2010 graduate (B.E. in ENI) at BITS Goa.



CEL BITS Goa had organized an interactive session with Mr. Asthana. Here are some of the points covered in the session.

Q. What did your four years at BITS look like?

- I spent most of my first year in the BITS campus building website for Waves, Quarks, and also designed the Sizzle Sands magazine. Additionally, I started a design consultancy called Greyscale, which enabled me to score many projects. I was also actively involved in anything and everything related to Computer Science.

Q. Can you tell us about TeliportME?

- Vineet and I realized that BITS 360 (a virtual tour consisting of 360° cylindrical panoramas of BITS campuses) had the potential to be ported as a product. BITS 360 had extended to the other BITS campuses as well. We were constantly looking for business applicability and trying to monetize the idea. With the increase in usage of smartphones, we came up with the idea to let people make virtual tours themselves and share them online. We created the smartphone app which was called 360, provided a business-focused offering, and built a virtual tour for NUS Singapore through a contract, which gave us the funds to bootstrap.
(TeliportME raised seed funding of $400k and was also India's first app to be published on the global google Playstore)

Q. What was the reason behind building Postman? What did the initial days of building postman look like?

- While working as an intern at Yahoo, I worked a lot on APIs and found a lot of issues around APIs that weren't optimized. I faced the same problem while building TeliportME. Postman initially started as a side project as a primary HTTP client developed on Chrome. After putting it up on the web store, people started using it and recommending it. When this side project gained a lot of traction, Ankit and I started churning out features. After Google reached out to us, we released a new version of Postman on the Chrome Web Store, gaining major traction. Eventually, we realized that there was a product-market fit, and we received several inbound calls from various VC firms which led to them raising our seed round of 1M dollars.

Q. Most of the startups are failing to acquire users whereas Postman scaled from zero to 10M users. What are the major issues faced by startups while scaling their users, and why aren't most startups successful in scaling their user base?

- "The zero to one" or "the zero to 10k" problem is extremely challenging. BITS 360, 360 and Postman had a similar pattern because they were fundamentally useful and solving something important. I think that people start building too much into the product early on, and the solving of that one problem is not implemented, whereas the business plan takes the upper hand. Postman never had a business plan. We mostly spent our time solving one or two problems faced by the users. I also think that the early founders have to be very vocal about campaigning the usefulness and finding the perfect channel where their users are.

Q. Since you've experienced both Venture-backed startups and Bootstrapping, when do you think you should bootstrap instead of raising funds?

- According to me, bootstrapping would be a better option than raising VC funds as VC acts like an accelerant to ideas. Founders should identify their product, their market, and they know how to crack it, and only then should they raise seed or pre-seed funding which would enable them to make good hires, and allocation of capital should be done judicially. Moreover, I think that the founders should look at specific milestones and that most of the time, large amounts of money in the early stages of building a startup could dilute the focus of the company, whereas bootstrapping enforces constraints and keeps the founders focused on the problem at hand.

Q. What would be your advice to the young entrepreneurs building ventures in college?

- My advice would be to focus on customers and their needs with utmost importance. Having at least one designated person to advocate the rights of the end-users in the initial stages of building the company is much needed. Additionally, founders should have the muscle to construct data-driven decisions very early on.

On behalf of team CEL BITS Goa, we would love to thank Mr. Abhinav for taking time off his schedule and being a part of this interview. We hope this interview will help enhance the entrepreneurial spirit of BITS and help inspire many students. To know more about such sessions and events hosted by CEL BITS Pilani Goa, you can follow us on our social media handles @celbitsgoa

a confluence of ideas academia

seminars/conferences/workshops/ training programs

BITS BIRAC BioNEST

BITS BIRAC BioNEST incubator, an initiative of Birla Institute of Technology and Science Pilani, K. K. Birla Goa Campus, promotes innovation and entrepreneurship in Health & Environment. BioNEST Goa is supported by BIRAC (Biotechnology Industry Research Assistance Council), a Non-profit organization under the Department of Biotechnology (DBT), Government of India.

BioNEST aims to help entrepreneurs ideate, incubate and accelerate their innovative early-stage startups into successful ventures through infrastructural support, mentoring, networking, and business advisory. The incubator brings entrepreneurs, mentors, researchers, and academicians together to create a vibrant startup ecosystem. Be a part of our network to participate in stimulating conversations, innovative thinking, and create progressive startups. Together, let us ignite the spark of new ideas and ventures.

For details, visit: https://www.bits-pilani.ac.in/Goa/BITSBIRAC/Home

Startups Incubated: Currently, BITS BIRAC BioNEST has 20 startups that are incubated.

HealthXcel: Accelerated Preincubation for Healthcare Startups

BITS Goa Innovation Incubation and Entrepreneurship Society (BGIIES) organized 'HealthXcel: An Accelerated Preincubation for Healthcare Startups', as a part of the celebration of 75 years of India's Independence–"Azadi Ka Amrit Mahotsav". Mr. Vibhav Joshi, Co-founder & Director, Child & Maternal Healthcare, InnAccel, and an associate incubatee at BITS BIRAC BioNEST, Goa, as Sattva MedTech, was the chief guest for the launch-programme held on 7th Sept. 2021.

HealthXcel is a 12-week hard-touch program with advanced start-up tool kits to help Idea-stage entrepreneurs to validate and scale their innovations. This initiative works on inculcating entrepreneurial skill sets in aspiring entrepreneurs & taking them through a brief journey on venture-creation exercise from idea to first sales.

During the launch-programme, Prof. Mridula Goel, Incharge of BITS BIRAC BioNEST, Goa, briefed the participants about BITS BIRAC BioNEST Incubator, the services offered, incubation facilities, technologies incubated, areas to be considered for incubating at BITS BIRAC BioNEST, Goa, and details about HealthXcel. She also introduced Mr. Joshi and spoke about his achievements. Mr. Joshi shared his journey as a young entrepreneur in building a startup company for novel medical devices and his struggles and experiences to obtain funding, regulatory approvals, etc. for their startup.

Out of the 34 applications, 14 teams having ideas in Healthcare, Medtech, Digital Therapeutics, Assistive tech., Disability, Artificial intelligence, Differentiated pharmaceutical dosage forms, Medical Devices, etc. were shortlisted for participating in HealthXcel. HealthXcel sessions helped the startups to scale up their healthcare ideas with access to high-end lab., mentoring and investor connections, intensive business training, 1-2-1 coaching.

The launch-programme was coordinated by Mr. Ebin Ephrem Elavathingal, General Manager, BITS BIRAC BioNEST, Goa.

FireSide Chat with Deep Bajaj: Co-Founder, PeeBuddy & Sirona

BITS BIRAC BioNEST, Goa organised a FireSide chat with an award-winning social entrepreneur Mr. Deep Bajaj, Co-Founder, PeeBuddy & Sirona, on 22nd Sept. 2021. The session was moderated by Prof. Mridula Goel, Incharge, BITS BIRAC BioNEST, Goa. Sirona is a new age (Product Innovation) startup with a range of categories defining Intimate & Menstrual Hygiene products for Women. PeeBuddy is India's first portable, disposable, and design patent-protected Female Urination Device (FUD). PeeBuddy has won multiple awards.

The chat on the journey of Mr. Bajaj's startup covered aspects like challenges in developing the product, hurdles in marketing the product, handling and dealing with the competitors in spite of having a patented product, the importance of customer

feedback for improvisation, the kind of key collaborations required to have a successful product. Mr. Bajaj also shed light on the mental strength, positive approach and the commitment required in the early stages of the startup which will drive an entrepreneur towards success. He further spoke about the range of products offered by Sirona, how the startup is working towards advancing their technology, and the market demand for their products across different countries.

Visit by Vice-Consul, Thailand Trade Centre

A delegation from the Royal Thai Consulate, led by Mr. Tanapat Sangaroon, Vice Consul, Royal Thai Consulate, visited BITS BIRAC BioNEST on 23rd Nov 2021. The delegation discussed opportunities for collaboration with BITS BIRAC BioNEST Team for joint incubation, acceleration & Market access programs with the Thailand Startup Ecosystem. Post-visit, we are exploring collaborations with the Prince of Songkla University Science Park for jointly organizing programs and events.

Virtual Stall set up in Start-Up Conference & Exhibition Themed 'Enhancing the Startup Ecosystem in Goa'

BITS BIRAC BioNEST, supported by BGIIES set up a virtual stall for enhanced outreach in the virtual Startup Conference & Exhibition on the theme 'Enhancing the Startup Ecosystem in Goa' organized by CII Goa and Startup Promotion Cell, Dept. of Information & Technology, Govt. of Goa, on 9th Dec 2021.

Entrepreneurship Awareness Bootcamp in Village Panchayat Agassaim, Goa

BITS Goa Innovation Incubation & Entrepreneurship Society (BGIIES) in association with Village Panchayat Agassaim, Goa, organized an 'Entrepreneurship Awareness Camp' on 11th Dec. 2021. The initiative is part of a series of events to help Goans whose livelihood is affected due to COVID-19. Sarpanch of the Village Panchayat, Agassaim, Mr. Xavier Gracias, inaugurated the Camp. Mr. Rahul Bahadur, Project officer, IIT Goa, spoke about the schemes and opportunities for entrepreneurs in Goa. Mr. Ebin and Ms. Sahita from the BITS BIRAC BioNEST team conducted the half-day camp, attended by over 50 participants.

Biotech Ecosystem in Goa: *A Discussion*

Yves-Marie Rault-Chodankar, a visiting scholar at the Centre for Social Sciences, Embassy of France in Delhi, visited the BITS BIRAC BioNEST on 13th Dec. 2021 for learning about the biotech ecosystem in Goa. His research is on the Biotech ecosystem in India and is funded by the Institut Francilien Recherche Innovation et Société (IFRIS), Paris. Prof. Mridula Goel, In-Charge, BITS BIRAC BioNEST, shared her experiences on the Biotech startup ecosystem in Goa and also discussed best global practices with the guest.

BITS BIRAC BioNEST has established partnerships with the following:

a) NASSCOM Foundation

NASSCOM Foundation Innovation Spaces (NFIS), part of NASSCOM Foundation, runs the Innovation Spaces program, in order to encourage ideas of students towards entrepreneurship. It is a structured program, normally backed by a donor, which starts with students applying virtually with their ideas. Applicants are taken through various tracks of learning related to their products, & the startup; and the top teams being provided with seed funds. These startups have the potential, and the seed fund helps them in their plans.

BITS BIRAC BioNEST has partnered with NASSCOM Foundation for this purpose and to help the funded startups achieve growth and stay focused on their goal.

b) Divyasampark iHUB Roorkee

The "iHub" is a Section 8 company, a joint initiative of the Department of Science & Technology (DST) GoI and the Indian Institute of Technology, Roorkee (IIT Roorkee). The hub will foster research innovation towards product/technology development and commercialization in CPS with relevant and next-generation Devices and Materials in the areas of a) Healthcare; b) Industry 4.0; and c) Smart Cities. Our partnership will enable startups incubated at BITS BIRAC BioNEST, supported by the BITS Goa Innovation Incubation and Entrepreneurship Society (BGIIES) to get market access and funds from the iHUB. It is planned to conduct joint initiatives and programs to strengthen the role of both organizations in developing the innovation and startup ecosystem in the Health and Environment areas.

c) Innovation-Technology Transfer Office, Foundation for Innovation and Technology Transfer (i-TTO FITT)

i-TTO FITT at IIT Delhi, under the National Biopharma Mission, supported by BIRAC, DBT, GoI with the objective of providing end-to-end services in all technical domains and aspects of Intellectual Property. The partnership can provide our startups with guidance for IP protection and technology transfer.

d) BITS BIRAC BioNEST becomes Incubator Partner with Headstart Hubs Alliance

BITS BIRAC BioNEST was invited to attend the India Finland Startup Hub meeting by Business Finland & Headstart Network Foundation organized in Bangalore on 23rd Oct. 2021. This has enabled the collaboration of BITS BIRAC BioNEST with Headstart Hubs Alliance as an Incubator partner, for the India Finland Startup Hub. The collaboration will help in exploring synergies with the Hubs from India and Accelerators from Finland, along with the government of both countries. Headstart is run completely by passionate volunteers with a bold vision for India. Since its inception, Headstart has built a grassroots level ecosystem in 25+ Indian cities and organized over 1000 startup events focused on networking, mentoring, hiring, and fundraising.

e) AMAZON WEB SERVICES (AWS)

AWS (Amazon Web services) as an official Activate Provider will help our startups access a host of free benefits, including AWS Cloud credits, AWS Business Support credits, exclusive members-only offers, and access to the Activate Console to help build and grow their businesses.

f) HUBSPOT

BITS BIRAC BioNEST has partnered with Hubspot to help our startup grow and scale better and faster. The Hubspot Partner Program offers eligible startups up to 90% off on HubSpot software. Also, Hubspot will provide Education Resources and Tailored Training, Masterclasses, templates, kits, and guides to help save time and avoid costly mistakes growing a startup, along with Access to world-class support from Hubspot experts.

g) GIT HUB

BITS BIRAC BioNEST has partnered with GitHub,the largest and most advanced development platform in the world. GitHub Accelerate shall support BITS BIRAC BioNEST portfolio startups having less than 5 years of existence in their technological growth by providing access to GitHub's enterprise products. The Startups that are a part of the GitHub Accelerate program get 20 seats on GitHub Enterprise for 1 year.

Dr. Oliver Fudym, the Attaché for Scientific and Academic Cooperation for West India at the Embassy of France/French Institute in India, visited K. K. Birla Goa Campus on 7th December 2021 for a Collaborative Meeting on Higher Studies, with the Goa Campus teaching faculty.

Coalescence 2021

Center for Entrepreneurial Leadership (CEL) under the aegis of Centre for Innovation, Incubation, and Entrepreneurship at the Goa Campus, organizes its flagship entrepreneurial annual summit–Coalescence. Coalescence 2021, held from 18th to 21st March was entirely online and attracted a footfall of more than 2500 students and professionals from across the country. The eminent speakers for Coalescence 2021 comprised of: Rohit Bansal (Co-Founder, SnapDeal), Anirudh Singla (Founder & CEO, Pepper), Aman Dhattarwal (YouTuber), Shwetabh Gangwar (YouTuber [Mensutra]; Best-selling Author), Sambhav Jain (Founder, Fampay), Ashok Ramachandran (CEO, Schindler India), Rathin Shah (Co-Founder & CEO, Spenny), Viraj Sheth (Co-Founder & CEO, Monk Entertainment), Rahul Mathur (Founder, BimaPe), Shephali Bhat (Tech & Culture Reporter, Economic Times), Sandeep Das (Strategy Consultant), Aanchal Agrawal (Digital Media Strategist), Capt. G. R. Gopinath (Founder, Air Deccan), Mohammad Hasan (Co-Founder, TagMnago), Monika Mehta (Co-Founder & CEO, Zealth.AI), and Akhil Singh (Co-founder, Questt).

distinguished lectures/ webinars

Date	Title of the Talk	Speaker's Name	Speaker's Designation/Affiliation	Organised by Department of
5th Aug 2021	Power of Electromagnetics: Trends & Technologies	Ms. Sumith S Pillai	Designtech Systems Ltd	EEE
6th Aug 2021	Microwave measurements using vector Network Analyzer	Mr. Sadanand Bhatt	BITS Pilani, K. K. Birla Goa campus	EEE

Date	Title of the Talk	Speaker's Name	Speaker's Designation/Affiliation	Organised by Department of
24th Sept 2021	D2D Communications: A path towards 5G and beyond cellular networks	Dr. Naveen Gupta	BITS Pilani, K. K. Birla Goa campus	EEE
20th Oct 2021	Workshop on 'Register a startup with Company Secretary & Lawyer'	Ms. Vibha Chandrakar	Consultant EY	BITS BIRAC BioNEST, Goa
10th Nov 2021	'Intellectual Property for Healthcare Startups'	Ms. Pooja Bhatia Vasaikar	Chief Manager I-TTO, Foundation for Innovation and Technology Transfer, IIT Delhi	BITS BIRAC BioNEST, Goa
20th Nov 2021	fifth-generation (5G) and its applications	Dr. Parag Aggrawal	BITS Pilani, K. K. Birla Goa campus	EEE
20th Nov 2021	'Business Strategies for Healthcare startups'	Ms. Ritika Arora	Co-founder of Manah Wellness	BITS BIRAC BioNEST, Goa
25th Nov 2021	'Building strategies for healthcare startups'	Ms. Shivanthika Murugan	Brand strategist–Remidio	BITS BIRAC BioNEST, Goa
25th Nov 2021	'Revenue Modelling fundamentals for Healthcare Startups'	Ms. Usha Palith	Startup Mentor, AIC-CCMB Freelance	BITS BIRAC BioNEST, Goa
27th Nov 2021	Training for 'Business Planning for Healthcare Startups'	Dr. Kumaresh Krishnamoorthy	Founder of AUM Med Tech	BITS BIRAC BioNEST, Goa
3rd Dec 2021	'Clinical Trial Fundamentals for Healthcare startups'	Ms. Aditi Hazra-Ganju	Co-founder, Saathealth	BITS BIRAC BioNEST, Goa
4th Dec 2021	Workshop on 'Creating a Winning Pitch Deck'	Mr. Chetan Bhatia	Founder -Honest Create; Pitch Trainer- Google for Startups Accelerator	BITS BIRAC BioNEST, Goa

alumni affairs

Talks by Alumni/Students On and Off Campus:

Apart from the organization of various events, the ARC was also involved in organizing regular lectures and talks from numerous alumni who have achieved success in their respective fields. Maintaining a strong alumni network, ARC has organized several talks in LTs, the telepresence room as well as online webinars to enable the student community to benefit from the interactions held with the alumni. The following is the list of events conducted:

Sr. No.	Dates	Title of the Talk	Speaker(s)
1	01-08-2021	Industry Insights - Electronics Segment	Rohan Garg Anshula S Rishav Rej
2	06-08-2021	Talk with Groww Founder	Ishan Bansal
3	03-09-2021	GREChamps	Advait Rane Punya Modi
4	01-10-2021	BITS2UPSC CSE	Divyanshu Nigam Jayant Singh Rathore
5	13-11-2021	Distinguished Alumni Talks	Akila Krishnakumar Parthasarathy N. S.

Launch of Alumni Mentorship Programme (AMP):

The Alumni Mentorship Programme was officially launched, and the application window is now open for all students from B.E. and M.E. programmes. The first domain of mentorship, launched in September 2021, focuses on providing mentorship to students while preparing MS/Ph.D. applications for higher education. We received over 150 applications, and the process of allocation of mentors will begin soon. Further domains of mentorship shall be launched as well, with further scope for expansion.

Prof. Suresh Ramaswamy Memorial Awards:

This year's Prof. Suresh Ramaswamy Memorial Award was given to the project titled, 'Smart Stick for Visually Impaired' done by Aviral Kumar Goel and Vaibhav Ganatra. The project was awarded prize money of Rs. 40000/- and was selected out of the 10 projects that had competed.

Mantra Awards:

The Center for Entrepreneurial Leadership (CEL) with Alumni Relations and BITSAA International instituted the Mantra Awards. The Mantra awards were introduced to recognize and reward outstanding students who have demonstrated extraordinary leadership potential and/or entrepreneurial initiative. This year's awards were given to the following:

Name & ID number	Category	Award money
Shashwat Madan (2016B2A40533G)	Outstanding Leadership (Male)	Rs. 7200/-
Arya Agarwal (2017B1A10831G)	Outstanding Leadership (Female)	Rs. 3600/-
Soumya A Thomas (2018B4AA0839G)	Outstanding Leadership (Female)	Rs. 3600/-
Shreyans Sancheti (2018A3PS1008G)	Entrepreneur of the Year Award	Rs. 7200/-
Raghav Khandelwal (2019A8PS0541G)	Social Leadership Award	Rs. 7200/-
Kshitij Chhabra (2017A8PS0691G)	Innovator of the Year Award	Rs. 7200/-

06/08/2021, BITSians' Day 2021:

BITSians' day was celebrated on 6th August 2021 virtually this year. ARC, BITS Goa, honored the event by taking a step forward for overall wellbeing. All BITSians, as a part of the 'FIT-BITS' challenge in collaboration with BurnCal, a BITSian start-up were encouraged to take up fitness challenges like pushups, squats, and jumping jacks, and the winners were awarded goodies. Another contest named 'Caption-It' was also hosted where all BITSians were asked to caption the 3 breathtaking photos of the Goa Campus. The participants with the best captions were given photo magnets and additional goodies. An interactive session was organized with Mr. Ishan Bansal, co-founder of Groww, where he shared his journey from BITS to co-founding a unicorn company. Dr. Sudhirkumar Barai, Director, BITS Pilani, Pilani Campus, Mr. Sachin Arya, Head, Alumni Relations, Prof. Rajeev Sakhuja, Associate Dean, Alumni Relations, Pilani Campus, and Prof. Veeky Baths, Associate Dean, Alumni Relations, Goa Campus were also present during the session.

22/10/2021, Covid-19 Support Initiative:

On the 22nd of October, 2021, as part of the Covid-19 Support Initiative by BITSAA International, the Alumni Relations Cell, BITS Pilani, K. K. Birla

Goa Campus, distributed school kits consisting of various stationery items among the needy students of the Government Primary School, Zari, Zuari Nagar (Kannada & Urdu medium) and Government Primary school, Zuarinagar (Marathi and Kannada medium) which cater to the poor families of the region.

04/12/2021, Director's e-Party Semester I, 2021-22:

The Director's Tea Party is a celebration of a new chapter in the lives of the outgoing batch as they step into the real world. The bi-annual Director's e-Party for the Graduating Class of 2021-22 (Semester I) was organized on 4th December 2021 in two parts; the main event was held online on Zoom followed by dinner at the A-mess. The Vice-Chancellor, Prof. Souvik Bhattacharyya, and Associate Dean of Alumni Relations, Prof. Veeky Baths, addressed the graduating batch, motivating them to reach new heights and reminding them that the BITS Pilani family would always be there to help. Our esteemed alumnus, Mr. Divyanshu Nigam, and the Chairman of BITSAA, Mr. Harsh Bhargava, also joined the event and congratulated the outgoing batch. Students took to the spotlight as they shared their comic and emotional experiences throughout their time in BITS-Pilani.

significant projects

Sr. No.	Title of the Project	Principal Investigator/ Co-investigator and Department	Funding Agency	Proposed/ Sanctioned amount (Rs. In Lakhs)
1	Development of a curvature-controllable continuum robot for complex manoeuvers	Dr. Ashwin K P Mechanical Engineering	SERB	27.63 Lakhs
2	Design of "smart" scaffolds incorporating nano-bioactive molecules for treatment of type 2 diabetes mellitus associated chronic wounds	Dr. Meenal Kowshik Biological Sciences Co-PI Dr. Indrani Talukdar Biological Sciences Dr. Jyutika Rajwade Scientist E, Agarkar Research Institute, Pune	ICMR	14.78 Lakhs (1st year)
3	Google AI4SG Award	Dr. Ashwin Srinivasan CS&IS	Google Award	USD 10,000 (7.35 Lakhs)
4	Azasulphone (heterocycles) for testing and evaluation	Dr. Mainak Banerjee	(7.35 Lakhs)	3.70
5	Design, Development and Bench-scale Demonstration of Electrochemical Hydroiodic Acid (HI) Decomposition in a Continuous Flow System for I-S Cycle	Dr. Pradeep Kumar Sow Chemical Engineering	BASF Chemicals India Private Limited	1.42 Lakhs
6	Modeling and simulation of production processes of Picoxystrobin, MOAT (N Methoxy 1 -(246 Trichloroprophenyl) Propane -2 amine), and DCF-TFAP (Dichloro Fluro Trifluro Acetophenone	Dr. S D Manjare Chemical Engineering	ONGC Energy Centre (OEC)	46.77 Lakhs

7	An Interdisciplinary study in machine learning and classification for astronomy	Dr. Snehanshu Saha, CS&IS Co-PI Dr. Jayant Murhty, IIAP	Deccan Fine Chemicals (India) Pvt. Ltd	25.43 Lakhs BITS share is Rs.14,24,406
8	Climate vulnerability of Mint crop in Barabanki UP	Dr. Rajiv Kumar Chaturvedi Humanities & Social Sciences	SERB- EMR	4.72 Lakhs
9	Comperative study of effect of dry and melt blending rotomolding materials	Dr. Sachin Waigaonkar Mechanical Engineering	BITS share is Rs.14,24,406	1.19 Lakhs
10	Using TinyML to enable near real-time human behaviour monitoring	Dr. Sougata Sen CS&IS	IORA Ecological Solutions Pvt Ltd	$8,000 (Appx. 5.76 Lakhs)
11	Scenarios of carbon sequestration Potential in India's forest sector in the context of global goals of Paris agreement on climate change and Bonn challenge on Reclamation of Degraded lands	Dr. Rajiv Kumar Chaturvedi Humanities & Social Sciences Co-PI Dr. Amit Garg (IIIM Ahmedabad)	Roots Multiclean Ltd	41.24 Lakhs (BITS share= 24.74 Lakhs)

enriching the learning experience

visits by faculty

invited talks / workshops by faculty at other Indian/Foreign institutes

Prof. Amrita Chatterjee, Department of Chemistry, delivered a lecture at ILDP START plus in Hiroshima University (short-term online exchange program) on 21st Dec 2021.

Rinku Rani Das, Atanu Chowdhury and Dr. Apurba Chakraborty (Department of EEE), submitted a paper entitled "Temperature dependent study between FinFET and gate all around (GAA) Nanowire FET and its linearity/harmonic distortion analysis", at the 2nd International Conference on Applied Electromagnetics, Signal processing and communication at KIIT University held from 26th – 28th Nov, 2021.

Prof. Amalin Prince A, Department of EEE, delivered an invited talk entitled as 'Tips for Open Book Course Facilitators: Experience Sharing' at SRM Institute of Science and Technology, Chennai on 30th Sept 2021.

Dr. Ashish Chittora, Department of EEE presented a paper entitled "Design of a Compact TM01-TE11 Mode Converter Using Periodic Iris Loading", at the 27th IEEE National Conference on Communications 2021, (IIT Kanpur), held from 27th to 30th July 2021 in virtual mode.

Dr. Ashish Chittora and Swati V. Yadav presented a paper entitled as "Cone-Shaped High Gain Antenna for Ultra-Wideband Applications" and "A High Power Circularly Polarized Antenna with Overmoded Waveguide", at the Indian Conference on Antenna and Propagation, held in Jaipur from 13th to 16th Dec 2021 in hybrid mode.

Roshan Roy, Ahan M R, Vaibhav Soni, and Dr. Ashish Chittora presented a paper entitled "Towards Automatic Transformer-based Cloud Classification and Segmentation" at the NeurIPS 2021 Workshop, held on 13th – 14th Dec 2021 in virtual mode.

Dr. Arnab Banerjee, Department of Biological Sciences, delivered an invited talk entitled 'Few new insights into the grand old master hormone-Mammalian Gonadotropin releasing hormone (GnRH-I): story from the hypothalamus' at the International Brain

Research Organization- Asia Pacific Regional Committee (IBRO-APRC) Associate School, organized by the Department of Zoology, Indira Gandhi National Tribal University (IGNTU), Amarkantak (MP), held from 20th to 24th September 2021.

Prof. Debasis Patnaik, Department of Economics & Finance, delivered an invited lecture on incubators as tools for entrepreneurship promotion entitled 'The university business incubator: a strategy for developing new research/ technology-based firms' at the Institute of Pharmaceutical Technology, Tirupati as part of AICTE Training and Learning (ATAL) Academy's Faculty Development Programme on the theme of Innovation, Incubation and Entrepreneurship on 9th July 2021.

Prof. Debasis Patnaik presented the following papers:
i. 'Decision tree Model on Health Care Sustainability in India' co-authored with Abhishek, S L Yadav at the 2nd International Conference on Chemical, Bio and Environmental Engineering (CHEMBIOEN-21) on 20th August 2021.
ii. 'Perception towards infection control measures among healthcare providers working in selected hospitals of Goa' by a PhD Scholar and Professor Shashi Lata Yadav (jointly authored) at the Dr. B. R. Ambedkar National Institute of Technology, Jalandhar on 21st August 2021.

Prof. Debasis Patnaik co-authored papers entitled 'Marine economy of coastal waters of South East Asian Regions' and 'Sanitation Issues in India' with & presented by Prof. Shashi Lata Yadav; and 'Mission Bhagiratha: Mitigation of Water related issues' with & presented by Prof. Sai Chandra Mouli Timiri, Osmania University, Hyderabad at the 12th International Convention on Asian Scholars Conference (ICAS12) held at Kyoto, Japan from 24th to 27th August 2021.

Prof. Debasis Patnaik virtually delivered a Keynote Address entitled 'Creativity and Innovations in Teaching and Evaluation for Engineering, Technology and Management' during the AICTE Training And Learning (ATAL) Academy's Faculty Development Programme on 'Blended Learning Strategies For Higher Education' at the University College of Commerce and Business Management, Mahatma Gandhi University, Nalgonda, Telangana held from 24th to 28th August 2021.

Prof. Debasis Patnaik was invited to be a Resource Person and the Chief Speaker for a workshop organized for PNB MetLife Officials on Rural Life Insurance held on 19th September 2021 held at Goa.

Prof. Debasis Patnaik co-authored papers presented at the 3rd International Conference on 'Healthcare and Wellbeing: Current Trends and Challenges' held virtually on 30th – 31st October 2021 at the Institute of Mental Health and Research Centre (IMHRC), Lucknow. Papers were in the area of Neuropsychiatric Symptoms in Parkinson's disease; Case Study on Schizophrenia; Empathy, and Assurance.

Prof. Debasis Patnaik was invited to be a Member of the Committee for the 7th International Symposium on Social Science and Contemporary Humanities Development (SSCHD-2021) held from 26th to 28th November 2021 at Nanjing, China. Prof. Patnaik delivered keynote address in the area of Sociology, Political Science, & Humanities and presented papers on 'Dalton Tax approach' and on 'Psychological Impact of Parental Alcoholism on Children' (co-authored with Mavis H, D Patnaik, Richa Shukla). Both papers are accepted for publication in WOS Journal.

Prof. Dipankar Pal, Department of EEE, delivered an invited talk entitled 'Engineering Education in India: Yesterday, Today & Tomorrow' at the International Conference on Technological Advancement in Science, Engineering, Management & Pharmaceutics (ICTASEMP-21) on 15th July 2021.

Manish Dash & Prof. D. Pal presented a paper entitled 'Multifunction Filter using CNTFET based Current Conveyors', IEEE Madras Section International Conference (IEEE MASCON 2021), held on 27th – 28th August 2021.

Debarshi Deka, Navaneeth Kumar & Prof. D. Pal presented a paper entitled 'Design of an ASIC-Based High Speed 32-bit Floating Point Adder', at 26th IEEE International Conference on Applied Electronics, University of West Bohemia, Pilsen, Czech Republic, held on 7th – 8th Sept 2021.

Taaha Nizam, V. Vijay, A. Srinivasulu & Prof. D. Pal presented a paper entitled 'Novel All-Pass Section for High-Performance Signal Processing Using CMOS DCCII', at IEEE TENCON 2021, Auckland, New Zealand, held from 7th– 10th December 2021.

Dr. Gautam Bacher, Department of EEE, delivered an invited talk entitled 'Electrochemical Impedance Spectroscopy (EIS) Based Biosensor' at Ramaiah Institute of Technology, Bangalore on 3rd Aug 2021.

Soham S. Deshpande and Dr. Hrishikesh S. Sonalikar (Department of EEE), submitted a paper entitled "Double Layer Absorber with Resistor Loaded Square Loop with Trapezium Sides and Jerusalem Cross Extensions", at 7th International Conference on Electronics, Computing and Communication Technologies (CONECCT 2021) at Bangaluru from 9th – 11th July 2021.

Aditya Mandar Jabade and Dr. Hrishikesh S. Sonalikar submitted a paper entitled "Wideband Circuit Analog Absorber Using Modified Resistive Cross-Dipoles", at 27th National Conference on Communications (NCC 2021) held at IIT Kanpur and Roorkee from 27th – 30th July 2021.

Prathamesh Sahasrabudhe and Dr. Hrishikesh S. Sonalikar submitted a paper entitled "Design of Circuit Analog Absorber Using Swastika Geometry With Split Square Rings", at 4th Indian Conference on Antennas and Propagation (InCAP 2021) held at Jaipur from 13th - 16th Dec 2021.

Nikhil Karoti and Dr. Hrishikesh S. Sonalikar submitted a paper entitled "Design of a Low Profile Wideband Absorber using Resistively Loaded Cross Dipole and Modified Square Loop", at 4th Indian Conference on Antennas and Propagation (InCAP 2021) held at Jaipur from 13th - 16th Dec 2021.

Dr. Indrakshi Raychowdhury, Department of Physics, delivered an invited talk entitled as 'Efforts Towards the Quantum Simulation of Non-Abelian Gauge Theories' at "Discussion Meeting: Topological Aspects of Strong Correlations and Gauge Theories (ONLINE)", at the International Centre for Theoretical Sciences, Bangalore on 10th Sept 2021.

Dr. Jegatha Nambi Krishnan, Department of Chemical Engineering, delivered an invited talk entitled 'Microfluidics - A Pulse for Electronics and Communications Engineers' at an online Webinar Series - Solaimalai College of Engineering, Madurai, Tamil-Nadu on 27th Aug 20221.

Prof. Judith M. Braganca, Department of Biological Sciences, delivered a talk entitled 'COVID 19 Vaccines –A boon to humanity' at the International Microorganisms day celebrated at Government College of Arts and Science, Khandola in collaboration with Microbiologists Society of India, on 17th September 2021 held in a hybrid mode as a Seminar cum Webinar.

D Fedorov, Y Tabarak, A Dadlani, MS Kumar, Dr. K Vipin (Department of EEE), presented a paper entitled as "Dynamics of Multi-Strain Malware Epidemics over Duty-Cycled Wireless Sensor Networks", at the IEEE International Balkan Conference on Communications and Networking (BalkanCom), Novi Sad, Serbia, in Sept. 2021.

Prof. Lakshmi Subramanian, Department of Humanities and Social Sciences delivered a lecture on 'Gandhi and the Politics of Amplification: Private and Public sounds' at Jindal Law University on 10th March 2021.

Prof. Lakshmi Subramanian presented a paper entitled 'Settling accounts straight: 'Indigenous bankers' in search of new histories in the twentieth century' in Common Law Research Seminar at the Max Planck Institute for Legal History and Legal Theory on 21st June 2021.

Prof. Lakshmi Subramanian delivered the 32nd Nabadurga Bannerjee Endowment Lecture at the Asiatic Society of Bombay on 7th Dec 2021 in an online mode, which could be watched using the following link: https://www.youtube.com/watch?v=_doJBtEGjDQ

Prof. Mainak Banerjee, Department of Chemistry, delivered a talk on "Green Chemistry: From Fundamentals to Research", at the Govt. College Sanquelim, Goa on 19th Nov 2021.

Dr. Minhajul, Department of Mathematics, delivered an invited talk entitled 'An Introduction to Partial Differential Equations' as part of "MAC MATH FEST 2021" celebration at Maulana Azad College, Kolkata held on 26th – 27th June 2021.

R. Bajpai, R. Soni, Dr. N. Gupta (Department of EEE) and A. Kumar, submitted a paper entitled "A Full-Duplex Multicarrier Cooperative Device-to-Device Communications System with MMSE based RSI Cancellation" in CROWNCOM 2021, Shijiazhuang, China on 11th Dec 2021 in an online mode.

A. Kumar, S. Saha, R. Bhattacharaya and Dr. N. Gupta submitted a paper entitled "An Eigenvalue based Cooperative Spectrum Sensing for Multiuser MIMO Cognitive Radio Networks under Correlated Fading Scenario" in CROWNCOM 2021, Shijiazhuang, China on 11th Dec 2021 in an online mode.

Ravishankar P. Desai and Dr. Narayan S. Manjarekar (Department of EEE), submitted a paper entitled "Norm-Based Robust Pitch Channel Control of an Autonomous Underwater Vehicle" at 13th IFAC Conference on Control Applications in Marine Systems, Robotics, and Vehicles CAMS 2021, Oldenburg, Germany, held from 22nd – 24th Sept 2021.

D. R. Karthik, Shashidhara Mecha Kotian and Dr. Narayan S Manjarekar submitted a paper entitled "Steady-state Initialization of Doubly Fed Induction Generator Based Wind Turbine Considering Grid Side Filter", at 13th IEEE PES Asia-Pacific Power and Energy Engineering Conference 2021 (APPEEC), held at Kovalam from 21st – 23rd Nov 2021.

D. R. Karthik, Shashidhara Mecha Kotian and Dr. Narayan S Manjarekar submitted a paper entitled "A Direct Method for Calculation of Steady-state Operating Conditions of a Doubly Fed Induction Generator", at International Conference on Power Systems 2021 (ICPS 2021) held at IIT Kharagpur from 16th – 18th Dec 2021.

Ravishankar P. Desai and Dr. Narayan S. Manjarekar submitted a paper entitled "Disturbance Observer based Sliding Mode Control for Lateral Motion of an AUV" at Seventh Indian Control Conference (ICC-7), held at IIT Bombay from 20th – 22nd Dec 2021.

Ravishankar P. Desai and Dr. Narayan S. Manjarekar submitted a paper entitled "Pitch Channel Tracking Control of an Autonomous Underwater Vehicle with Delayed Output" at IEEE 18th India Council International Conference (INDICON) 2021, held at IIT Guwahati, from 19th to 21st Dec 2021.

Abhijit Dey, Kaushik Iyer and Prof. Nitin Sharma (Department of EEE) submitted a paper entitled 'S-band Interference Detection and Mitigation using a Vector Tracking-based NavIC Software Receiver', for Proceedings of the 34th International Technical Meeting of the Satellite Division of The Institute of Navigation held from 20th – 24th Sept 2021.

Ritu Dhankhar and Prof. Prasanna Kumar, Department of Mathematics, presented a paper on the Location of Zeros of Polynomials at 1151st American Mathematical Society Fall Western sectional meeting at Department of Mathematics and Statistics, University of New Mexico, Albuquerque, New Mexico, held on 23rd – 24th Oct 2021.

Dr. R. Kadlimatti (Department of EEE), S. Jha and A. Bhandari presented a paper entitled as "Polyphase Good Code Sets Based on Symmetrical and Anti-symmetrical Segments of Linear/Piecewise Linear FM Waveforms," in the 2nd International Conference on Range Technology (ICORT), held on 5th– 6th August 2021, in virtual mode.

Dr. Rakesh R Warier, Department of EEE, delivered an invited talk entitled 'Finite-Time Control and Estimation' at IIT Bombay on 11th Dec 2021.

Prof. Ranjan Dey delivered an Invited Talk entitled "Thermodynamics and its Engineering Applications", at DMR PG College, Mapusa, Goa on 28th Oct 2021.

Prof. Ranjan Dey delivered an Invited Talk entitled "Newly Developed, Simple Yet Highly Effective Approaches for Predicting Thermophysical Properties", IIT- Palakkad on 9th Oct 2021.

Prof. Ranjan Dey delivered an Invited Talk entitled "Ideal Solutions and their Properties", at Darul Uloom Autonomous College, Hyderabad on 17th Nov 2021.

Prof. Ranjan Dey was invited to be a Resource Person for an Online Refresher Course on Chemistry at the Interface with Biology and Material Science on "Molecular Interaction Studies Based on Solution Thermodynamics", at H S Gour University, Sagar, M.P. from 11th – 25th Nov 2021.

Prof. Ranjan Dey was invited to be a Resource Person for conference on "Applications of Chemistry in Advanced Technology", Under DBT Star College Scheme at CMP Degree College, Prayagraj, on 4th Dec 2021.

Prof. S S Baral, Department of Chemical Engineering, delivered an invited talk entitled 'Defects in photocatalysis: formation, classification and characterization' at IMMT Bhubaneswar, CHEMCON-2021 on 29th Dec 2021.

Dr. Sarang Dhongdi, Department of EEE, delivered an invited talk entitled 'Network of Underwater sensor nodes and vehicles' at BITS Pilani, Pilani Campus on 17th Sept 2021.

Dr. Saranya G Nair, Department of Mathematics, delivered an invited talk on "Hardy- Ramanujan formula for Partition function" as a part of National Mathematics Day celebration at Mar Thoma College, Tiruvalla, Kerala on 18th Dec 2021.

Dr. Sudarshan Swain, Department of EEE, delivered an invited talk entitled 'Control of Grid connected PV systems under various Power Quality Conditions' at NIT Jalandhar on 21st Oct 2021.

Dr. Soumyabrata Barik (Department of EEE) and Debapriya Das, presented a paper entitled as "Athletic Run Based Optimization: A novel method for the integration of DGs and shunt capacitors," in the IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT) held from 9th to 11th July 2021.

Dr. Soumyabrata Barik, Debapriya Das, Ramesh C. Bansal, Raj M. Naidoo, and Narottam Das, submitted a paper entitled "A Novel Forward-Backward Zero Bus Power Flow Method for the Placement of Renewable DGs in Distribution Network," in 31st Australasian Universities Power Engineering Conference (AUPEC), Perth Australia, from 26th – 30th Sept. 2021 in virtual mode.

Dr. Soumyabrata Barik, Bikash Das, Vivekananda Mukherjee and Debapriya Das, presented a paper entitled "Dynamic analysis of split-shaft microturbine for stand-alone and grid-connected mode of operation," at IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), held from 9th to 11th July 2021.

Prof. Tarkeshwar Singh, Department of Mathematics, delivered a keynote speech on 'Local Distance Antimagic Labeling of Graphs', in 11th International Workshop on Graph Labeling (IWOGL 2021) organized by University of New Castle, University of Indonesia and Technical University Kosice Slovakia held on 22nd – 23rd Sept. 2021.

Prof. Tarkeshwar Singh delivered an invited talk on Distance Magic Index of Graphs in International Conference on Graph Theory and Applications (GTA 2021) organized by the Department of Mathematics, Goa University in association with International Academy of Physical Sciences (IAPS) held from 26th – 28th Oct. 2021.

Dr. Vipin Kizheppatt, Department of EEE, delivered an invited talk entitled 'Hardware solutions to Neural Networks' at DRDO Young Scientist's Laboratory, Chennai on 18th Nov 2021.

Dr. Yasmeen Shameem Akhtar, Department of Mathematics, delivered a talk on 'Combinatorial Testing using Covering Arrays, Department Seminar in Aug 2021.

faculty achievements

Prof. Arnab Banerjee, Department of Biological Sciences, was awarded with the prestigious Prof. M. A. Akbarsha & Prof. M. Michael Aruldhas Gold Medal Oration -2021 by the Society for Reproductive Biology and Comparative Endocrinology [SRBCE].

Prof. Debasis Patnaik, Department of Economics & Finance, was appointed the Chairman and Convener of a three-member panel on 'Water Resource Management and Utility in South and SE Asia' at the 12th International Convention on Asian Scholars Conference (ICAS12) held at Kyoto, Japan from 24th to 27th August 2021.

Prof. Debasis Patnaik was awarded "Bharat Ratna Dr. Radhakrishnan Gold Medal" on the occasion of 77th National Unity Conference on Individual Achievements & National Development organized by GEPRA, New Delhi on 30th October 2021.

Prof. Dibakar Chakrabarty, Department of Biological Sciences, and Akriti Rastogi authored a book chapter:
The Cnidaria: Only a Problem or Also a Resource? In 'Jellies from the Southeast Asian Seas: Pains and Gains', Nova Science Publishers, Inc, USA.

Dr. Javed Ahmad Bhat, Department of Economics and Finance published the following book chapter:
Bhat, J, A., (2021) "Choice Among Alternatives- An Evaluation of Indian Energy Basket", Design, Analysis & Application of Renewable Energy Systems, Elsevier.

Prof. Mainak Banerjee, Department of Chemistry, deputed as a session judge in a two-day virtual international conference on "Advances in Green Chemistry and Sustainable Technology" DM's College, Goa on 29th - 30th Sept 2021.

Prof. Narendra Nath Ghosh, Department of Chemistry has been invited to be a full member of Sigma Xi Society. Sigma Xi, the Scientific Research Honor Society is one of the oldest & largest international scientific organizations in the field of science and engineering. Prof. Ghosh and his team have been engaged in remarkable research in the area of nanoscience and nanotechnology. His current work is involved in the development of new nanostructured materials to address the issues related to energy storage devices, environmental pollution, etc.

Dr. Rajiv Kumar Chaturvedi, Department of Humanities and Social Sciences has been selected as an expert member for Goa State Governing Council of the State Level Steering Committee for National Adaptation Funds for Climate Change (SLSC for NAFCC) established by The Ministry of Environment, Forests and Climate Change, Govt. of India for a 3-year term.

Dr. Soumyabrata Barik (Department of EEE), Bikash Das, Vivekananda Mukherjee and Debapriya Das, authored a book chapter:
'Optimization Algorithm for Renewable Energy Integration' in 'Intelligent Renewable Energy Systems: Integrating Artificial Intelligence Techniques and Optimization Algorithms', John Wiley and Sons.

student achievements

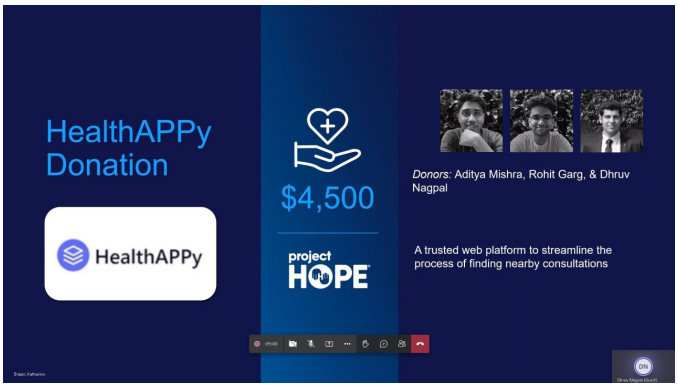
Prof. Souvik Bhattacharyya, Vice Chancellor of BITS Pilani unveiled a rover designed by a team of students of BITS Pilani, K K Birla Goa Campus in presence of Prof. D M Kulkarni, Dean Administration on 13th Nov 2021. The multidisciplinary team of students which started in 2018 is called Project Kratos: Mars Rover. Presently the team comprises of about **70 students lead by Mr. Ithihas Madala and supervised by Prof. Toby Joseph (Dept. of Physics). Project Kratos** aspires to develop a Mars Rovers equipped with advanced subsystems suitable for interplanetary deep space missions, seeking to study the application of engineering and scientific research into rover robotics, autonomous traversal, and detection of extraterrestrial life.
The team is preparing to participate in the competitions such as International Rover Competition (IRC), University Rover Competition (URC), International Mars Hackathon and the International Rover Design Challenge. In these competitions the rover is expected to fulfill tasks such as Extreme Retrieval task through rough terrain, Equipment Servicing task to perform intricate operations with 5 Degrees of Freedom arm, Autonomous Navigation and Life

Detection.
Project Kratos involves various subsystems which contribute to the making of the rover.

1. Mechanical - Works on the mechanical framework, designing and manufacturing of the entire rover. We will be using SOLIDWORKS as our main CAD software along with ANSYS for the FEA of the design.
2. Autonomous - Is responsible for autonomous traversal of the rover in a non-discovered environment. We perform tasks like path planning, object detection and localization to enable the rover to calculate an optimum path using data from various sensors. ROS (Robotics Operating System) is used, and a firm grasp on Python or C++ is required.
3. Life Detection - its objective is to design experimental techniques to detect life. The system uses Computation and Spectroscopic techniques to study soil and rocks characteristics, traditional lab techniques and emerging techniques like bioelectronics and biosensors.
4. Electronics - Looks after interfacing between all on board electronics including a 5 Degree of freedom robotic arm, communication to the base station and powering the rover with the help of a customized Battery Management System.

A 5 minute video about the rover: https://youtu.be/_h06yqiy6YQ

Team comprising **Aditya Mishra** (2018A7PS0117G), **Dhruv Nagpal** (2018A7PS0095G) and **Rohit Garg** (2018A7PS0193G) participated in the hackathon 'COVID-19 Healthcare App Challenge' conducted by IQVIA technologies and Microsoft. Their web application 'HealthAPPy' was recognized as "Best Integration with Microsoft Power Apps Winner". The team donated the Prize money of $4,500 to a non-profit NGO 'Project Hope'.



The link for the same are as following:
Felicitation ceremony video - https://www.iqvia.com/landing/hackathon-winner
The award winners showcase page - https://devpost.com/software/healthappy

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A 3 member-team consisting of **Bhanupratap Bhardwaj** (2019A4PS0723G), **Chirag Goyle** (2019A4PS0534G) and **Heman Ketan Shah** (2019A4PS0772G) won IIM Ahmedabad's Annual Flagship Case Study Competition, 'Armageddon' at their annual 'Red Bricks Summit'. The Red Bricks Summit is Asia's largest management symposium that attracts over 60,000 participants every year.

The case study competition was conducted in 3 rounds, with 2 case studies. The first case study was related to the digital growth strategy of a traditional brick-and-mortar retail company in India. The second case study was a case study on UPI Payments apps. It included formulating an expansion strategy and a revenue growth model for a UPI company in India by understanding the market and regulatory landscape to devise a GTM strategy for generating revenue in the next 5 years.
This is the first time that an undergraduate team has won this competition, considered India's most prestigious Case Study competition. The competition had over 1550 participating teams, with a prize pool of INR 80,000.

Team comprising of **Akash Jha** (2018B5A80893G), **Ritvij Kumar Sharma** (2019A8PS0666G), **Aviral Bansal** (2017B4A41015G) and **Arihant Bansal** (2020A3PS0567G) won 3rd Prize in 'Harmony Bridging TradFi to DeFi Hackathon'. Harmony Hackathon invited developers to design solutions to bring Traditional Finance to Decentralized Finance using their cross-chain bridges. It saw over 750 participants and over a 100 submitted projects, competing for over $1 million in prizes and seed funding.

Team comprising of **Akash Jha** (2018B5A80893G), **Ritvij Kumar Sharma** (2019A8PS0666G), **Aviral Bansal** (2017B4A41015G), **Mayank Mathur** (2019A3PS0505G),**KrishanuShah**(2020A7PS1728G), **Sanskar Mohapatra** (2020A1PS2112G) and **Arihant Bansal** (2020A3PS0567G) won "Harmony Composable Prize" and "Chainlink On The Rise" Prize in 'Chainlink Fall 2021 Hackathon'. Chainlink Hackathon brought together developers to build the next generation of hybrid smart contracts alongside developers, creators, artists, and industry-leading mentors from across the blockchain ecosystem. It saw 1500+ participants all across the globe, with over 250 projects submitted.

Team comprising of **Akash Jha** (2018B5A80893G), **Ritvij Kumar Sharma** (2019A8PS0666G), **Aviral Bansal** (2017B4A41015G), **Anshuman Singh** (2018A4PS0512G) and **Arihant Bansal** (2020A3PS0567G) won 2nd Prize in 'IoTeX Grants Hackathon'. IoTeX, a leading decentralized, scalable, and EVM-compatible blockchain network for real-world dApps and digital assets, launched IoTeX Hackathon India 2021, in partnership with Lumos Labs. This virtual hackathon saw over 1500+ pan-India registration, wherein developers had to build dApps using real world data from Pebble tracker.

Aashish Moses (2018PHXF0008G), won the Best Paper Award for International Chemical Engineering Conference 2021 (100 Glorious Years of Chemical Engineering & Technology) at Dr B R Ambedkar National Institute of Technology, Jalandhar held from 16th – 19th Sept 2021.

Abhijit Dey (2017PHXF0423G), Research Scholar of the Department of Electrical and Electronics Engineering, received the visiting Ph.D. researcher position in the department of Aeronautical and Aviation Engineering (AAE), the Hong Kong Polytechnic University (HKPolyU), SAR, China. From March 2021 to October 2021, he served as the doctoral researcher in intelligent positioning and navigation laboratory, department of AAE, HKPolyU under the supervision of Dr. Bing Xu and Dr. Li-Ta Hsu. He was involved in the research related to direct position estimation (DPE), time-frequency analysis of global navigation satellite systems (GNSS) multipath error, and advance vector tracking-based receiver architecture for navigation with Indian Constellation (NavIC) signals.

Abhijit Dey (2017PHXF0423G), Research Scholar of the Department of Electrical and Electronics Engineering, was invited to participate and contribute in the GNSS training programme, 11-14 January 2022, Pokhara, Nepal, jointly organized by the Centre of Spatial Information Science (CSIS), The University of Tokyo (UTokyo), Japan and the International Committee on Global Navigation Satellite Systems (ICG). Abhijit Dey (2017PHXF0423G) has reviewed six research articles for the journals such as IEEE Transactions on Aerospace and Electronic Systems, IEEE Systems, IEEE Sensors and IEEE Access.

Anupam Mukherjee (2017PHXF0408G) has won the VICAL Award for Best Students Paper Presentations in Chemcon-2021 awarded by the Indian Institute of Chemical Engineers (IIChE). The award was presented virtually on 16th Dec 2021 at the Annual INAE Convention. The VICAL Award includes a cash prize of Rs. 5,000. Anupam also won the Young Chemical Engineer below 35 yrs of age, at CHEMCON-2021. Anupam is currently working as a Research Associate at CSIR-IICT, Hyderabad after submitting his PhD thesis.

Anirudh Nagaraj (2018A7PS0216G) and **KotamReddy Ganesh Reddy** (2018AAPS0353H) co-authored a

paper titled "Leak Detection in Smart Water Grids Using EPANET and Machine Learning Techniques" (link) which has been published in the IETE Journal of Education. The other authors of the paper were from CSIR-CEERI Pilani.

Akshay Valsaraj (2018B1A70608G), **Ithihas Madala** (2018B1AA0607G) and **Nikhil Garg** (alumni) under the guidance of **Prof. Veeky Baths** published a paper titled "Alzheimer's Dementia Detection Using Acoustic & Linguistic Features and Pre-trained BERT'' at the 2021 8th International Conference on Soft Computing and Machine Intelligence (ISCMI).
The paper can be found here: https://ieeexplore.ieee.org/document/9654804
They are also currently working on another project titled "Comparison of NLP and EEG for Sentiment Analysis" under Prof Veeky Baths.

Avdhesh Vermani (2019A1PS1060G), student of the Department of Chemical Engineering won second prize at the 17th Outstanding Young Chemical Engineer 2021, a national level competition organized by Indian Institute of Chemical Engineers, held on 2nd - 3rd September 2021 for the paper entitled "Application of Artificial Intelligence Algorithms to Capture Bubble Geometry Variations in a Gas-Liquid Contacting System", co-authored with Mr. Anupam Mukherjee, Mr. Abhichal Ghosh, Dr. Kamesh Reddi, Dr. Siddhartha Moulik and Dr. Anirban Roy.

Avdhesh Vermani also presented a paper entitled "Application of a Deep Learning Based Image Processing Framework to Predict Mass Transfer Coefficient in a Gas-Liquid Contacting System: A Case Study for Bubble Geometry Variations in Surfactant Ozonation System" at the 10th International Congress on Sustainability Science and Engineering, an international level conference organized by American Institute of Chemical Engineers, held from 13th to 15th September 2021. The paper was co-authored with Mr. Anupam Mukherjee, Mr. Abhichal Ghosh, Dr. Kamesh Reddi, Dr. Siddhartha Moulik and Dr. Anirban Roy.

Lubna Muzamil Rehman (2018H1010021G) has won the Innovative Student Projects Award 2021 at Master's Level for her Thesis titled 'Understanding Thermodynamics of Salt-Water Systems' awarded by the Indian National Academy of Engineering (INAE). The award was presented virtually on 16th Dec 2021 at the Annual INAE Convention. The INAE Award includes a cash prize of Rs. 15,000 and an INAE-Student Membership for the next 5 years. Lubna is currently pursuing her PhD at KAUST, SA in Membrane Technology.

Malini Roy (2019A1PS1112G) was awarded the first prize for the best Technical Paper Presentation at the 17th Outstanding Young Chemical Engineer 2021, a national level competition organised by Indian Institute of Chemical Engineers held on 2nd – 3rd September 2021. The paper entitled, 'Development of a Deep Learning Based Hydrodynamic Cavitation Technology for Dye Degradation: An Artificial Intelligence (AI) - Machine Learning (ML) Framework' was co-authored with Jasneet Kaur Pala, Anupam Mukherjee, Dr Anirban Roy, Dr Reddi Kamesh and Dr Siddhartha Moulik.

Nikhil Mane, Kathit Shah, Sanjay Mane, Prof. Arnab Banerjee (Department of Biological Sciences) and Dr. Siddhartha Tripathi were awarded Prof. M.G. Deshpande Award BEST PAPER Award in Academia for presenting the paper entitled "Effect of Newtonian and shear thinning medium on human sperm motion within a microchannel" Fluid Mechanics and Fluid Power, at 48th National Conference, held from 27th - 29th Dec 2021, at Dept. of Mechanical Engg. BITS Pilani, Pilani Campus.

Pranay Mathur (2017A8TS0487G), **Yash Jangir** (2019A8PS0526G) and **Prof. Neena Goveas** (Professor, Dept. of CSIS) won the Best Paper Award for the paper entitled "A Generalized Kalman Filter Augmented Deep-Learning based Approach for Autonomous Landing in MAVs" at the International Symposium of Asian Control Association on Intelligent Robotics and Industrial Automation (IRIA), held from 19th to 22nd September 2021.

Prayag Mohanty (2020A3PS0566G) participated in the Linquiztics SciBizTech Quiz'21 (Finalist) organised by The Literary, Debate, Quiz Club, MIT Manipal held from 1st to 5th Oct 2021.

Ritvij Kumar Sharma (2019A8PS0666G), **Akash Jha** (2018B5A80893G),**Arihant Bansal**(2020A3PS0567G)

and **Aviral Bansal** (2017B4A41015G) participated in the Harmony - Bridging TradFi to DeFi hackathon and won the third prize in Track 3: Cross-Chain - "DeFi/ NFT/DAO". Their project was selected in the top 23 finalists out of 104 projects. The project is sort of a card game but it uses NFTs. People can join by connecting their Metamask wallet and buy base NFTs that they provide and then use those to craft NFTs of higher rarity. The looks of all NFTs are created by the team. People can also buy and sell NFTs in their marketplace and with increase in rarity of the NFTs, and can get a higher rank on the leaderboard. Currently, this project is in the prototype phase. Hackathon website link: https://gitcoin.co/hackathon/harmony-defi/onboard

Shameer Ahmed B (2017PHXF0006G) of PhD student of Department of Biological Sciences was awarded Elekta award for attending virtually the EPSM 2021-Conference attended EPSM held from 8th – 10th Nov 2021.

Shikha Bhat (2019A7PS0063G) received 2 prestigious scholarships:

1. Generation Google Scholarship for women in Computer Science 2021 APAC Region, by Google

Generation Google Scholarship: for women in computer science was established to help aspiring students pursuing computer science degrees excel in technology and become leaders in the field. The scholarship was awarded based on a passion for technology, academic excellence, demonstrated leadership, and commitment to diversity, equity, and inclusion. She received a scholarship amount of USD $1,000 and got to attend the 2021 APAC Scholars' Virtual Retreat that took place at the end of June, hosted by Google.

https://buildyourfuture.withgoogle.com/scholarships/google-scholarship-recipients/
https://buildyourfuture.withgoogle.com/scholarships/generation-google-scholarship-apac/

2. Grace Hopper Celebration Student Scholarship 2021, by AnitaB.org

The Grace Hopper Celebration of Women in Computing (GHC) is a series of conferences designed to bring the research and career interests of women in computing to the forefront. It is the world's largest gathering of women in computing. She was awarded the student scholarship to attend virtual GHC 2021 (September 27th - October 2nd) by AnitaB.org, based on academic merit, interest in CS and work done to uplift the community.

https://www.gracehoppercelebration.com/
https://en.wikipedia.org/wiki/Grace_Hopper_Celebration_of_Women_in_Computing

Shivam Nikam (2020B2AA1911G) a student of Department of Chemistry, won the 2nd Prize in the Elocution Competition organised by Goa Shipyard Limited on the occasion of Vigilance Awareness Week-2021 observed from 26th Oct to 1st Nov 2021 with the theme 'Independent India @ 75: Self Reliance with Integrity'.

Shreya Kapila (2018A1PS0538G) a final year student of Chemical Engineering, made an Oral Presentation for her work on "Microbial Surfactants As Green Emulsifiers For Skincare Cosmetic Nano-formulations" at Gulf Coast Undergraduate Research Symposium (GCURS) organized by Rice University, USA on 16th October 2021. She was one of the only 3 Indians and one of the 250 researchers selected from all over the world to participate in this most prestigious undergraduate research conference in the southeast. She worked under the guidance of Prof. Vivek Rangarajan.

Centre for Innovation, Incubation and Entrepreneurship (CIIE)

Achievements of Startups by student/ alumni of BITS Goa:

2020 and 2021 have been phenomenal years for the startups founded by our students.

Between June 2021 to January 2022, 14 startups founded / co-founded by students/ alumni of BITS Pilani, K K Birla Goa Campus raised over 2.6 billion USD funding from different sources. Of these 8 startups founded in 2020 & 2021 raised over 13.5 million USD. The remaining 6 startups were founded between 2014 and 2018. Out of 14 startups, 5 startups were founded by the students while they were still studying.

MPL - India's largest esports and gaming platform, co-founded in 2018 by a 2005 batch student Mr. Shubham Malhotra, raised 2.3 billion USD and became India's second gaming startup unicorn.
Postman, co-founded in 2014 by a 2006 batch student Mr. Abhinav Asthana raised 225 USD dollars. Postman, India's fourth SaaS unicorn, provides a platform that helps software developers accelerate the development process through collaboration with various stakeholders. The platform is used by over 11 million developers across the world, and more than 500,000 companies globally, including the likes of Microsoft and Twitter.
A California based start-up Locus, founded in 2015 by a 2007 batch student Mr. Nishith Rastogi received 50 million USD. Locus is an intelligent logistics automation platform that has developed a solution to help on-demand and scheduled businesses, dispatch, track and manage their on-field workforce.
Remaining 11 startups founded / co-founded by the Goa Campus students have raised over 60 million dollars during this period.

Name (Founded in)	Founder/s (Batch of)	Brief info of startup	Funding Received (in month & year)	Funding Agency
Locus (2015)	Nishith Rastogi (2007-12)	Locus uses technology and proprietary algorithms to provide smart logistics solutions such as route optimisation, real-time tracking, insights and analytics, vehicle allocation, and utilisation.	$50 MILLION (June 2021)	1) GIC 2) Qualcomm Ventures 3) Falcon Edge Capital 4) Blume Ventures 5) Tiger Global 6) Pi Ventures 7) Exfinity Venture Partners
Codedamn (2020)	Mehul Mohan (2017-21)	It is an interactive learn to code platform, for first-time coders and experienced developers to learn, practice, build projects and get instant feedback in real-time.	Undisclosed (July 2021)	Antler India
Burncal (2020)	Chetan Reddy & Vichar Shroff (both 2013-17)	It is a virtualised personal fitness app. It was founded during COVID, to tackle the problem faced by people while doing workouts which was consistency.	$330,000 (July 2021)	1) Titan Capital 2) SenseAI Ventures 3) 100X 4) FirstCheque 5) 2 AM VC
Flam (2021)	1)Shourya Agarwal (2013-18) 2)Rajat Gupta (2013-17)	Flam is the world's first Augmented Reality (AR) based social media network built for a global audience.	$3.5 million (July 2021)	1) SVQuad 2) ICP 3) Kwaish Ventures 4) 9Unicorns

Name (Founded in)	Founder/s (Batch of)	Brief info of startup	Funding Received (in month & year)	Funding Agency
BlueLearn (2020)	1)Harish Uthayakumar 2)Shreyans Sancheti (both 2018-22)	The company provides a one-stop platform for students to learn new skills, network with peers, and apply for internships, especially for students in Tier-2 and Tier-3 colleges.	$450,000 (August 2021)	1) LightSpeed 2) 100X 3) Titan Capital 4) 2 AM VC
Postman (2014)	Abhinav Asthana (2006-10)	It is a SAAS based startup that aims to simplify API development, it became worlds most valued SAAS s	$225million (August 2021)	1) Bond Capital 2) Battery Ventures
Habbit (2020)	1)Raghav Goyal (2015-20) 2)Somnath Sandeep (2015-19)	Habbit is an online experiential learning company that aims to bridge the gap between passionate mentors and creative learners through live mentorship and community building.	$320,000 (September 2021)	1) Ashok Goyal 2) Sanjeev Goenka Group
MPL (2018)	Shubham Malhotra (2005-09)	It is India's largest e-sports and gaming platform.	$2.3 Billion (September 2021)	Legatum Capital
FloBiz (2018)	Aditya Naik (2009-14)	Neobanking services to Indian SMBs.	$31 Million (September 2021)	Sequoia Capital
Questt (2020)	Akhil Singh (2010-14)	Questt is an assessment/ homework platform that automates homework assessment for teachers, saving 90% of their time and gamifies assignments for students.	$6.75 Million (October 2021)	1) Celestia Capital 2) Premji Invest
Stratzy (2021)	1)Gaurav Sangle 2)MohIt Bhandari (both 2016-21	Stratzy is a platform that helps users choose from our curated created ideas and strategies for investments.	$800,000 (October 2021)	1) Titan Capital 2) First Cheque 3) Leo Capital
Stoa School (2020)	1)Raj Kunkolienkar (2012-15)	Online business school focused on developing talent for the startup economy	$1.5 Million (October 2021)	1) Kunal Shah 2) Nitin Kamath 3) Gagan Bayani

Name (Founded in)	Founder/s (Batch of)	Brief info of startup	Funding Received (in month & year)	Funding Agency
Pyxis One (2017)	1)Vrushali Prasade 2)Harikrishna Valiyath 3)Shubham Mishra (All 2012-16)	AI-based marketing cloud to automate creative management and generation at scale. Pyxis is powered by AI-led creative automation which enables one to rapidly create, launch and iterate best performing ads across digital marketing platforms.	$17 Million (January 2022)	1) General Atlantic 2) Celestia Capital 3) Premji Invest 4) Chiratae Ventures
Thinkerbell Labs (2016)	1) Sanskriti Dawle 2) Aman Srivastava 3) Dilip Ramesh (2012-16) 4) Saif Shaikh (2013-17)	They make products that help improve learning outcomes for the visually impaired.	Rs 1.05 Cr (January 2022)	1) Namita Thapar 2) Peyush Bansal 3) Anupam Mittal In Shark Tank India, an Indian business reality television show

Teaching- Learning Centre

Teaching Learning Centre (TLC) at KK Birla Goa Campus evolved its programs further and worked on its vision, which is to provide and foster a thriving culture for excellence in teaching-learning processes. It provided a forum to discuss and evolve new ideas in education to address current challenges. The following activities were carried out by Teaching Learning Centre during the last semester.

Workshops conducted by teaching learning center

TLC conducted an orientation session for new faculty members from 16th to 18th August 2021. The following topics were covered during the session.

a) Administrative Structure of BITS Pilani and K. K. Birla Goa Campus – Prof. Sutapa Roy Ramanan
b) Academic Structure in BITS – Prof. Neena Goveas
c) Know your Library – Dr. Anuradha V
d) Class Preparations – Prof. Radhika Vathsan
e) Classroom Ethics and Etiquette– Prof. Reena Cheruvalath
f) Pedagogy and Academic Standards and WILP – Prof. K. R. Anupama
g) A walk through the functioning of the Sponsored Research and Consultancy Division – Prof. Meenal Kowshik
h) Functioning of AGSRD – Prof. Bharat M. Deshpande

Research Projects supported by TLC

a) Research project on “Impact and prospects of computer gaming on academic and socio-cultural progress of undergraduate students at BITS-Pilani K. K. Birla Goa Campus” by Dr. Sayantani Sarkar, Department of Humanities & Social Sciences.
b) Research project on “Characterization of Students’ Feedback for Gaining Actionable Insights” by Dr. Swati Agarwal, Department of Computer Science & Information Systems.
c) ‘A git and docket-based tool chain for introductory programming course’ by Dr. Swaroop Joshi, Department of Computer Science and Information Systems.
d) ‘Exploring relationship between students and mentors; A study of learning activity through group work’ by Dr. Mohan Kumar Bera, Department of Humanities and Social Sciences.
e) ‘Indian ocean region seaports and vessel traffic atlas project for classroom teaching’ by Prof. R. P.

Pradhan, Department of Humanities and Social Sciences.
f) 'Teaching and learning of communication courses on software defined radio platform' by Dr. Naveen Gupta, Department of Electronics and Electrical Engineering.

Teacher's day event conducted by TLC in September 2021

TLC felicitated the following faculty members, who retired recently, on the eve of Teacher's Day on 4th Sept 2021.
a) Prof. K. E. Raman, Former Director and Professor, Department of Electronics and Electrical Engineering.
b) Prof. Meenakshi Raman, Professor, Department of Humanities and Social Sciences.
c) Prof. Aditya. P. Koley, Professor, Department of Chemistry.
d) Prof. J. V. Rao, Professor, Department of Computer Science and information systems.

TLC published two newsletters (ANUNAAD I and II) over the last two years

2nd edition of TLC newsletter ANUNAAD, released on 5th Dec 2021, included the following articles by faculty members of BITS Pilani:
a) My Take on Teaching – Prof. K. R. Anupama – K. K. Birla Goa Campus
b) Teaching Enginnering Courses – Prof. P. Srinivasan - Pilani Campus.
c) Teaching –Learning A Rewarding Career – Prof. V. K. Chaubey – Pilani Campus.
d) My Experiment with Truth – In the Classroom – Prof. Sandip Deshmukh – Hyderabad Campus.

Faculty members appointment on national/ international advisory committees/ acted as reviewers for books/ journals of national/ international repute

Faculty Name	Department of	Name of Advisory Committee / Editorial Board
Prof. Rajesh Mehrotra	Biological Sciences	(i) Ancestral sequence of a large number promiscuous enzyme family corresponds to bridges in sequence space in a network representation for Journal of the Royal Society Interface (ii) Circlize package in R: contribution values of ABCDE and AGL6 genes in the context of floral organ development (iii) Genome wide insilico characterization and stress induced expression analysis of BCL-2 gene associated anthanogene (BAG) family in Musa Spp for Nature Scientific Reports. (iv) Evolution analysis of angiosperms dehydrins gene family reveals three orthologs group associated to specific protein domains for nature Scientific reports.
Prof. Sandhya Mehrotra	Biological Sciences	Reviewed articles for the Journal Physiology and Molecular Biology of Plants
Prof. Srikanth Mutnuri	Biological Sciences	(i) Scientific Panel member for Alcoholic Beverages - Food Safety and Standards Authority of India (FSSAI) (ii) Member of the Syllabus Sub Committee for framing the Curricula and Syllabi for B.E Environmental Engineering, Anna University, Chennai
Dr. Jegatha Nambi Krishnan	Chemical Engineering	(i) Review Editor - Frontiers in Electronics - "Wearable Electronics" (ii) Reviewed - BioChip Journal

Faculty Name	Department of	Name of Advisory Committee / Editorial Board
Prof. Ranjan Dey	Chemistry	Reviewed Papers: (i) Journal of Chemical Thermodynamics - Five Papers. (Impact Factor – 3.18) (ii) Journal of Molecular Liquids. (Impact Factor – 6.2) (iii) International Journal of Biological Macromolecules. (Impact Factor – 6.95) (iv) Frontiers in Chemistry (Impact Factor – 5.2). (v) Physical Chemistry Chemical Physical [Pccp] (Impact Factor – 3.76). (vi) Journal of Chemical Engineering Data [Jced] (Impact Factor – 2.69) Co-Editor: Special Issue –Frontiers in Chemistry: "Solvation Effects Of Organic Reactions In Ionic Liquids, Deep Eutectic Solvents, And Conventional Solvents"
Dr. Swaroop Joshi	CS&IS	Associated Editor of Journal of Engineering Education Transformations
Dr. Aditya Challa	CS&IS	Reviewed - International Journal of Computer Vision
Dr. Sougata Sen	CS&IS	Editorial Board Member of Elsevier Ad Hoc Networks journal Reviewed: (i) Elsevier Pervasive and Mobile Computing journal (ii) ACM Transactions on Computing for Healthcare (iii) ACM Interactive, Mobile, Wearable and Ubiquitous Technologies journal
Dr. Javed Ahmad Bhat	Economics and Finance	Reviewed Journals: (i) Macroeconomics and Finance in Emerging Market Economies, (ii) The Indian Economic Journal, (iii) Journal of Social and Economic Development
Prof. Lakshmi Subramanian	Humanities and Social Sciences	(i) Expert member in Panel on History and Archeology by the Flanders Research Association (Belgium) (ii) Member of the Board of Trustees, India Foundation for the Arts (iii) Contributing editor to the Oxford Research Encyclopedia of Asian Commercial History
Dr. Monojit Bhattacharjee	Mathematics	Mathematical Reviews/ MathSciNet for American Mathematical Society

introducing new faculty

Name	Department	Designation	Area of Research Interest
Surjya Ghosh	CS & IS	Assistant Professor, Gr-I	Computer Systems, Human Computer Interaction
Sudarshan Swain	EEE	Assistant Professor, Gr-I	Power Electronics, Power Quality, Renewable Power

Name	Department	Designation	Area of Research Interest
Indrakshi Raychowdhury	Physics	Assistant Professor, Gr-I	Theoretical High Energy Physics
Aditya Challa	CS & IS	Assistant Professor, Gr-I	Computer Science, Machine Learning, Computer Vision
Gunja Sachdeva	Mathematics	Assistant Professor, Gr-I	Number Theory, Representation Theory, Algebra
Manish Gupta	EEE	Assistant Professor, Gr-I	Semi-conductor Devices & Materials, Ferroelectric Devices & Memory, Simulations & Modelling
Arnab Kumar Paul	CS & IS	Assistant Professor, Gr-I	Storage Systems, High Performance Computing, Distributed Systems, Operating Systems

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Cover Picture:
Prof. D M Kulkarni, Dean Administration presents a farewell memento to Prof. G Raghurama during his farewell function.

innovate achieve lead

BITS Pilani
K K Birla Goa Campus

mediaspeak

BITS Goa students unveil Mars Rover

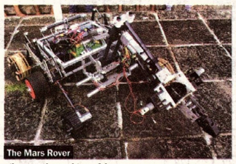
NT KURIOCITY

A Mars Rover designed by a team of students of BITS Pilani, K K Birla Goa Campus was recently unveiled by BITS Pilani Vice Chancellor, professor, Souvik Bhattacharyya in the presence of professor, Dean Administration, D M Kulkarni.

The multidisciplinary team of students which started in 2018 is called Project Kratos: Mars Rover. Presently the team comprises of about 70 students led by Ithihas Madala and supervised by professor Toby Joseph (Department of Physics). The rover is equipped with advanced subsystems suitable for interplanetary deep space missions, seeking to study the application of engineering and scientific research into rover robotics, autonomous traversal, and detection of extraterrestrial life.

The team is preparing to participate in competitions such as International Rover Competition (IRC), University Rover Competition (URC), International Mars Hackathon, and the International Rover Design Challenge. In these competitions the rover is expected to fulfil tasks such as Extreme Retrieval task through rough terrain, Equipment Servicing task to perform intricate operations with 5 Degrees of Freedom arm, Autonomous Navigation and Life Detection.

Project Kratos involves various subsystems which contribute to the making of the rover:


The Mars Rover

Mechanical - Works on the mechanical framework, designing and manufacturing of the entire rover. SOLIDWORKS is the main CAD software along with ANSYS for the FEA of the design.

Autonomous - Is responsible for autonomous traversal of the rover in a non-discovered environment. We perform tasks like path planning, object detection and localisation to enable the rover to calculate an optimum path using data from various sensors. ROS (Robotics Operating System) is used, and a firm grasp on Python or C++ is required.

Life Detection - The objective is to design experimental techniques to detect life. The system uses computation and spectroscopic techniques to study soil and rocks characteristics, traditional lab techniques and emerging techniques like bioelectronics and biosensors.

4. Electronics – This looks after interfacing between all on board electronics including a 5 degree of freedom robotic arm, communication to the base station and powering the rover with the help of a customised Battery Management System.

Team with Vice Chancellor, professor, Souvik Bhattacharyya

Despite slump, BITS-Goa sees 91% placement, highest gets ₹43.4L/yr

Gauree.Malkarnekar
@timesgroup.com

Panaji: Even as the economic impact of the pandemic continues to be felt across sectors, students of BITS Pilani KK Birla Goa campus have managed to beat the slump for the second consecutive year, with 91% students being placed. The highest pay package bagged by students matched that of last year, with a CTC of Rs 43.3 lakh. The offer was made to seven students by Microsoft.

The average CTC offered was Rs 16 lakh per annum.

The placement season saw 736 students of the Goa campus receiving offers, which was 162 more students getting offers as compared to 2019-20. Due to an increase in intake, the number of students registered for placements had increased from 635 to 808 during 2020-21.

"There was a 28.2% growth in students placed from last year, ie, 736 students placed this year compared to 574 students placed last year," said Balasubramanian Gurumurthy, chief placement officer, India & Dubai, BITS Pilani.

CAMPUS CHAMPIONS

- **Consulting roles** were in demand among engineering students
- Prominent companies offered roles in **management & IT consulting**
- Students also showed great interest in **analytics and management**
- Unicorns like **CRED, Postman, Groww, Swiggy and BYJU's** offered jobs
- **20% of registered students** opted for such roles, indicating **entrepreneurial spirit**
- Students also received offers in emerging tech like **cryptography and blockchain**

▶ Microsoft tops, P 2

BITS distributes school kits to Govt. Primary Schools at Zari & Zuarinagar

Recently BITS Pilani, K K Birla Goa Campus, with the help of financial support from BITSAA International, distributed 67 school kits consisting of a school bag, note-books and other stationery material to the students of two government primary schools in Zari and Zuarinagar - located in the vicinity of the campus. Funding of about Rs. 30,000/- for distributing these school kits was coordinated and arranged by Prof. Veeky Baths, Associate Dean, Alumni Relations at BITS Pilani, K K Birla Goa Campus through BITSAA International.

Heads of both schools appreciated BITS Pilani's efforts in reaching out to the underprivileged students and supporting them with such necessary items.

On behalf of BITS Pilani, Estate Manager Mr. A K Patil, Faculty In-Charge of Community Welfare Dr. Rashmi Chauhan, PRO Mr. Arjun Halarnkar and Alumni Relations Cell official Mr. Bhalwinder Singh Sohal attended the functions held at the respective schools.

BITSAA (BITS Pilani Alumni Association) has over 84000 alumni spanning over six decades. BITSAA International engages in charitable and educational activities by raising funds for setting up endowments, creating scholarships, rewarding teaching and research and generally promoting the development of resources at Birla Institute of Technology and Science at Pilani, Dubai, Goa & Hyderabad campuses. For more information log on to https://www.bitsaa.org/

अंध बांधवांसाठी उपयोगी 'स्मार्ट स्टिक'

पुरस्कारही जाहीर : बिटस पिलानीच्या दोन विद्यार्थ्यांकडून निर्मिती

पुढारी विशेष

पणजी : पुढारी वृत्तसेवा

अंध बांधवांना मदत करण्यासाठी त्यांच्या हाती असणाऱ्या काठीतून त्यांना आपोआप मार्गदर्शन करणारी प्रणाली बिटस पिलानीच्या दोन विद्यार्थ्यांनी विकसित केली. त्यांच्या या समाजोपयोगी कार्यासाठी यंदाचा प्रा. सुरेश रामास्वामी स्मृती पुरस्कार जाहीर झाला आहे. संस्थेच्या माजी विद्यार्थ्यांनीच हा पुरस्कार देणे सुरू केले आहे.

संगणक विज्ञान विद्याशाखेतील अविरल गोयल आणि वैभव गणत्रा यांनी ही अनोखी मदतकाठी बनवली आहे. त्यांनी या काठीत कॅमेरा बसवला. तो कॅमेरा अंध व्यक्तींच्या मार्गात येणाऱ्या अडथळ्यांची आपोआप छायाचित्रे टिपतो.

वैभव गणत्रा अविरल गोयल

मोबाईलशी या कॅमेरा जोडलेला असतो आणि त्यासाठी तयार केलेल्या प्रणालीच्या माध्यमातून व्यक्तीला अडथळ्यांविषयी आवाजी माहिती दिली जाते. त्यामुळे आपल्या मार्गातील अडथळे ते पाहू शकत नसतानाही ते त्यापासून काळजी घेत आपला संचार करू शकतात.

हा पुरस्काराचे स्वरूप ४० हजार रुपये व प्रमाणपत्र असे आहे. विद्यार्थी दशेतच संशोधनाला प्रोत्साहन देण्यासाठी हा पुरस्कार देण्यात येतो. देशभरातील बिटस संस्थेतील प्रकल्पांतून एका प्रकल्पाची या पुरस्कारासाठी निवड केली जाते. यंदाही १० प्रकल्प या पुरस्कारासाठी पाठवण्यात आले होते. त्यातून झुआरीनगरातील बिटस पिलानी संकुलातील दोन विद्यार्थ्यांनी तयार केलेल्या या प्रकल्पाची निवड पुरस्कारासाठी झाली आहे.

यंदाचा प्रकल्पांचे परीक्षण प्रा. विकी बाथ, प्रा. रवीप्रसाद अदुरी, प्रा. रामप्रसाद जोशी, प्रा. कार्तिकियन गणेसरेथिनम, प्रा. गौरव डार, प्रा. पी. नंदकुमार, प्रा. टोबी जोसेफ, प्रा. दीपक मुर्ती पचाट्ट यांनी केले.

Govt appoints three panels on climate change

THE GOAN | NETWORK

PANAJI

The Goa government has appointed three State-level panels in a bid to propel and scale-up projects for adaptation of climate change under the State and national action plans for climate change (SAPCC) and (NAPCC).

The first panel -- State Governing Council -- is headed by the Chief Minister and another, the State level Steering Committee will be headed by the Chief Secretary. The Environment Secretary heads a third body, the Climate Change Cell.

The Chief Minister headed State Governing Council, also has two expert members -- Dr Lidita Khandeparkar who is the principal scientist at the NIO and Rajiv Kumar Chaturvedi, who is assistant professor at the BITS Pilani Goa campus.

Other members of the State

Change Cell.

The Chief Minister headed State Governing Council, also has two expert members -- Dr Lidita Khandeparkar who is the principal scientist at the NIO and Rajiv Kumar Chaturvedi, who is assistant professor at the BITS Pilani Goa campus.

Other members of the State Governing Council are the Environment Minister, the Chief Secretary and Secretaries to the Goa government for forest,

›Continued on P5

THE GOAN EVERYDAY Tue, 21 epaper.

BITS Goa students win IIMA's 'Armageddon'

The students of BITS Goa recently won IIM Ahmedabad's Annual Flagship Case Study Competition, 'Armageddon'. This is the first time that an undergraduate team has won this competition, which is considered India's most prestigious case study competition. NT KURIOCITY learns more

NT KURIOCITY

A three-member team (Bhanupratap Bhardwaj, Chirag Goyle and Heman Ketan Shah) from BITS Pilani, K K Birla Goa Campus won IIM Ahmedabad's Annual Flagship Case Study Competition, 'Armageddon' at the annual Red Bricks Summit that was held recently. The Red Bricks Summit is Asia's largest management symposium that attracts over 60,000 participants every year.

The competition which had over 1550 participating teams, with a prize pool of ₹80,000, was conducted in three rounds, with two case studies. Mechanical engineering student Bhardwaj who is currently in his pre-final year says: "The first case study was related to the digital growth strategy of a traditional brick-and-mortar retail company in India. The second case study was a case study on UPI Payments apps. It included formulating an expansion strategy and a revenue growth model for a UPI company in India by understanding the market and regulatory landscape to devise a Go-To-Market strategy for generating revenue in the next 5 years."

He adds that case study competitions are about presenting a solution to situations faced by any organisation, whether a business, non-profit, or government agency.

A third-year engineering student, Shah says that the consulting culture at BITS Goa has exponentially increased in the last few years. "We three were a part of the consulting club of our campus. We bonded over projects that our consulting club undertook in the past one year. With our interest in management consulting, we decided to participate in consulting case competitions. We started our case competition journey with a few lows. We did not qualify to the final round in our initial competitions, but our passion for consulting kept us going," he says adding that they eyed the IIMA case competition when they first heard of it in August.

"We were in awe of the competition after seeing the participants, mainly from top B-schools in India. We decided to give it our best shot and learn as much as we can from this."

While Goyle, who is also a pre-final year student pursuing BE in mechanical engineering, says that it is truly a surreal feeling, and the win is yet to fully sink in. He says: "We were engineering students competing against more than 1500 teams from some of the best management students in India, from IIM Ahmedabad, IIM Bangalore, ISB Hyderabad, IIM Calcutta and X L R I Jamshedpur and others. Many of the participants already had years of work experience at top finance and management companies and multi-national companies. So, we went into this competition with an objective to learn as much as we could and to strive to achieve our best possible performance."

Bhanupratap Bhardwaj Heman Shah Chirag Goyle

Talking about how they prepared for the competition, Shah says that they started off by reading and analysing various reports and news articles online from government agencies like NITI Aayog and some private companies to fully understand the scope of the problem they were dealing with.

"Then, we compiled the information we collected from our research and built a suitable case presentation. For the final round, since there was an esteemed panel of judges from the academic world and the corporate world, we decided to step up and practice our presentation well, by trying to give an effective presentation while also adhering to the time limit," says Shah.

Bhardwaj says that at the beginning, they went into this competition with the thought that they will perform to the best of their abilities, and they will see what happens. He says that their confidence started building after they cleared the initial as well as the second round. "While going for the finals, we came to know that senior professors and professionals would be judging our presentations. So we put in some more effort, despite the fact that our exams were close. While we were confident of our abilities, the other finalists were stellar as well, and we knew that to compete with them, we would have to give it our best efforts. To be honest, we didn't think too much about the winning, and decided to just focus on giving it our best shot and that let us keep a cool head throughout, and helped us focus on performing to the best of our abilities."

All said and done, Goyle says that it was a great experience overall from the beginning. He says: "We had a chance to share our work with other participants after the competition and learned a lot from them, and made some new friends along the way. The feedback from the judges in the finals was very valuable and we will be connecting with them soon to have a deeper conversation about the case study and their views on it."

(RK)

Prof. G Raghurama successfully completes tenure as Director of BITS Pilani

Prof. Raghurama recently completed his five-year tenure as the Director of BITS Pilani, K K Birla Goa Campus. He was given a very affectionate and reluctant farewell by the BITS family, where he served for the last 34 years. He announced that he will be soon joining Dehradun Institute of Technology University (DITU) as its Vice Chancellor. He joined BITS Pilani at Pilani in Rajasthan as an assistant lecturer in 1987 and became

a Senior Professor in the EEE department in 2012. He had completed his MSc in Physics with first rank and distinction from IIT Madras and obtained his PhD from IISc Bangalore. He is an accomplished teacher, teaching and guiding students in the areas of Electronic Sciences, Instrumentation, Computer Organization, Communication Engineering, Telecommunication Networks and Management. Prof. Raghurama also guided completion of construction of 6 hostel buildings and the New Academic Block as part of the Phase II Infrastructure Development of Goa Campus.

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