Annual Report 2023-24
Institution's Innovation Council (IIC)
Mar Baselios College of Engineering and Technology (Autonomous)
Mar Ivanios Vidyanagar, Trivandrum, Kerala

A. About IIC MBCET

Ministry of Human Resource Development (MHRD), Govt. of India has established 'MHRD's Innovation Cell (MIC)' to systematically foster the culture of Innovation amongst all Higher Education Institutions (HEIs). The primary mandate of MIC is to encourage, inspire and nurture young students by supporting them to work with new ideas and transform them into prototypes.

Major focus

- To create a vibrant local innovation ecosystem.
- Start-up supporting Mechanism in HEIs.
- Prepare institute for Atal Ranking of Institutions on Innovation Achievements Framework.
- Establish Function Ecosystem for Scouting Ideas and Pre-incubation of Ideas.
- Develop better Cognitive Ability for Technology Students

Vision

To become a Centre of Excellence in Innovation and Entrepreneurship.

Mission

1. To develop and encourage the spirit of innovation among students for handling socially relevant projects.
2. To spearhead the Institutional Innovation Rankings.
3. To kindle a Learner centered approach that focuses on entrepreneurial skill upgradation.
4. To enable an ecosystem that promote start-ups and entrepreneurial ventures of students, faculty and staff

IIC MBCET is actively involving in spreading the spirit of innovation and entrepreneurship in and out the campus by conducting various activities in domains like Innovation, Entrepreneurship and IPR, strictly adhering to the guidelines of MIC from the year 2018 and awarded with 4.5 star rating for the excellent performance in the academic year 2019-20,4 star (the highest rating) in the academic year 2020-21, 3.5 star rating in 2021-22 academic year and 2 star rating in 2022-23 academic year.

In addition to all the activities, faculty members from MBCET have attended the Innovation Ambassador training (Foundation Level and Advanced Level), the students have participated in the National Innovation Contest, developing online repository, ATL linkage, Mentor Mentee Program and Smart India Hackathon.

The summary of activities conducted by the IIC MBCET during the academic year 2021-22 are listed below.

- IIC calendar Activities   –   13
- MIC driven Activities   –   4
- Self-Driven Activities   –   12

- Celebration Day Activities - 4

B. **Brief mention of key functionaries at the IIC Institute**

Sr. No.	Name of Member	Member Type (Teaching/ Non Teaching /Student/External Expert)	Key Role/ Position assigned in IIC
1	Mr Arun J. S.	Teaching	Vice President
2	Mr. Jijo Jose	Teaching	Convener
3	Mr Sherry Varghese George	Teaching	Social Media Coordinator
4	Ms Rakhi S	Teaching	ARIIA & NIRF Coordinator
5	Dr.Lani Rachel Mathew	Teaching	NISP Coordinator
6	Dr Prasanth P.S.	Teaching	IPR Activity Coordinator
7	Dr. Sheryl Arulini	Teaching	Secretary & Faculty in Charge for Yukthi
8	Dr Dishore S. V.	Teaching	Innovations Coordinator
9	Ms. Sreeja S R	Teaching	Internships Coordinator
10	Ms. Ansu Mathew	Teaching	Start up Coordinator
11	Dr Pradeep M.	Teaching	Member
12	Mr Shiras S N	Teaching	Member
13	Mr. Deepu S Nath	External Expert	Member
14	Mr V. K. Adarsh	External Expert	Member
15	Mr. Ashok Kurian Panjikkaran	External Expert	Expert from Nearby Incubation Center
16	Mr Sreenivasa Pai G	External Expert	Expert from Indian Overseas Bank (Thiruvananthapuram)
17	Mr Safikh Sadiq	External Expert	IP / Patent Expert
18	Mr. Savio Victor	External Expert	Member- Alumni Entrepreneur
19	Ms. Anoushka L Nair	Student	IIC Lead & Innovation Coordinator
20	Mr. Abhilash George	Student	IIC Co Lead & Startup Coordinator
21	Ms. Ann Santhosh	Student	IIC Operation Lead
22	Ms. Nandhana V	Student	IIC Marketing & IPR Coordinator

C. **Portfolio/graphical/Tabular representation of Resource strength (human capital and Physical capital) of the IIC institution**

Total No. of IIC Members	22
Total No. of IAs	Foundation Level – 4 Advanced Level – 2
Total No. of faculty Mentors	6
Pre-Incubation Units	
• Name of the Incubation centre • Thrust Area • No of Start-up Incubated • Faculty In charge	Dr. APJ Abdul Kalam Centre for Innovation, Incubation and Entrepreneurship (ACIIE) Electronics & IT 7 Mr. Arun J S, Assistant Professor

D. **Highlight Facilities, Infrastructure of Pre-Incubation & Incubation kind and Student bodies/clubs engaged in promotion of Innovation and Entrepreneurship in the campus.**

- **Name of the pre- incubation centre** - Dr. APJ Abdul Kalam Centre for Innovation, Incubation and Entrepreneurship (ACIIE)
- **Types of Services offered** –
    - Mentoring support
    - Seed grant assistance
    - Incubation facility
- **Facilities** –
    - IEDC Maker Space
    - Access to software and hardware Lab
    - High Speed Internet Connectivity
    - Access to Experts/Mentors/Advisory support
    - Access to Library and e Library of the institution
    - Access to Venture capital fund support
    - Co working space at Incubation Unit
    - Grand and Mini Challenges, Competitions etc
    - Idea/innovation validation consultation and expert service
    - PoC validation
    - Provide access to avail seed/grant support/ access to Govt. schemes available

- **Student Bodies/ Club – Innovation and Entrepreneurship Development Centre(IEDC) –** Established under Kerala Start-up Mission (KSUM)

E. Highlight Achievements (Narrative/Graphical/tabular representation)
    - Number and Different types of I&E and IPR activities Conducted

SL No	Activity Type	Title
1	IIC Calendar Activity	Unlock Your Potential-Ignite Your Passion-Design Your Destiny!
2	IIC Calendar Activity	Field Visit to Vizhinjam International Seaport

3	IIC Calendar Activity	Prelims of SMART INDIA HACKATHON 2023
4	Self-Driven Activity	Hands-on Training on Industrial Automation
5	Self-Driven Activity	Entrepreneurship and Innovation as Career Opportunity
6	Self-Driven Activity	Workshop on Innovative Testing Using MATLAB
7	IIC Calendar Activity	LiDAR Applications in Advanced Surveying
8	IIC Calendar Activity	Tech Insights: Journeying into the World of Innovation
9	IIC Calendar Activity	Nuts and Bolts: How a Nail Built the World or Why We Should Reinvent the Wheel
10	Celebration Day Activity	Energy Conservation Day: Poster making competition
11	Celebration Day Activity	National Science Day: The Nano Nexus - '24
12	Self-Driven Activity	Hands-on sessions on "Introduction to FastAPI and GraphQL
13	Self-Driven Activity	Industrial Visit to KEL Kochi
14	Self-Driven Activity	Entrepreneurship Skill, Attitude, and Behavior Development
15	IIC Calendar Activity	Workshop on Prototype and Process Development
16	IIC Calendar Activity	Field/Exposure Visit to Incubation Unit/Patent Facilitation Centre/Technology Transfer Centre
17	IIC Calendar Activity	IPR Awareness Session and Student Project Exhibition
18	IIC Calendar Activity	Mentoring Event: Demo Day/Project exhibition
19	Celebration Activity	National Technology Day
20	Self-Driven Activity	Naviga 1.0 –The autonomous Navigation Assistance Robot for Campus Exploration.
21	IIC Calendar Activity	Skill Development Program, Certified 5 day course on REVIT Architecture
22	IIC Calendar Activity	Understand The Indian Securities Market and Create Wealth
23	IIC Calendar Activity	Mentoring Event

24	Celebration Activity	Independence Day
25	MIC Activity	Guiding Framework for Creating and Engaging Trained Faculty and Student IIC Members Innovation Ambassadors (IA) in IIC Institutions and Rewarding Mechanisms for IAs
26	MIC Activity	Orientation cum Refreshers' Session on Institution's Innovation Council Objectives, Structure, Operation for IIC Institutions
27	MIC Activity	Building the Pipeline of Quality Innovations and Startups in HEIs with Ecosystem Enablers by Creating and Managing YUKTI Innovation and IPR Repository (YIIR)
28	MIC Activity	Strengthening IIC Linkages with ATLs and SICs in Schools and Framework for providing Mentorship Guidance
29	MIC Activity	A Fresh Start: Exploring a New World
30	IIC Calendar Activity	Innovation Strategies for Engineers
31	IIC Calendar Activity	Showcasing Innovation
32	Self-Driven Activity	Boot camp on allied technologies for UAS/Drone
33	Self-Driven Activity	Data Logger Internship -Summer 2024

- No. of student's & faculty ideas generated – 171
- No. of student's & faculty Innovation/prototypes developed - 106
- No. of IPs generated, published and granted - 3
- No. of Student & Faculty Start-ups/Ventures established.- 1
- Amount spent on promotion and awareness generation on Innovation Entrepreneurship in the campus – 155950
- Amount grant or fund supported to student & Faculty lead Innovations, start-ups and IPR - 859278
- No. of Technology Transfer and Commercialisation happened - 0

F. Highlight few best IIC Faculty/Student members and their achievements/ Rewarded for the innovations at different forum

1. **Mr. Arun J S** – Innovation Ambassador(Advanced Level)
2. **Mr. Jijo Jose** – Innovation ambassador (Advanced Level), Principal Investigator, KSUM-KWA Hackathon
3. **Mr. Sherry Varghese George** – Innovation Ambassador
4. **Mr. Pradeep M** – Innovation Ambassador
5. **Mr. Shiras S N** – Innovation Ambassador
6. **Ms. Sherin Mathew** - Innovation Ambassador

G. Highlight selected best Innovations & images with mention of inventor/innovation name

IoT Based Smart Farming
A project executed by
IEDC, Mar Baselios College of Engineering and Technology (Autonomous), Mar Ivanios Vidyanagar, Trivandrum

Jointly with
ICAR-Central Tuber Crops Research Institute(CTCRI), Trivandrum
and Naaden Agro Private Limited, Trivandrum

An initiative of
Corporate Relations, Mar Baselios College of Engineering and Technology (Autonomous),
Mar Ivanios Vidyanagar, Trivandrum

Smart farming at a glance
The field of agriculture is increasingly shaped by technological advancements, enabling precise monitoring and control of various farming parameters. This innovative approach, known as smart farming, uses various technologies to provide to generate crop specific agro-advisories on the nutrient and water requirements through e-Crop and its execution through a smart fertigation device, which ensures the accurate and efficient delivery of water and nutrients directly to the crop roots, optimizing growth and resource use.

e-Crop
The e-Crop device developed by the ICAR-Central Tuber Crops Research Institute is a game-changer from traditional farming to smart farming, flourishing in an era of precision agriculture powered by the Internet of Things (IoT) and artificial intelligence (AI). This pioneering technology has been patented by ICAR-CTCRI. The e-Crop is geared with weather sensors attached with the device that continuously monitor weather parameters and crop modeling, which works as the backbone, and it generates agro-advisories on the nutrient and water requirements of the crops and directly sends them to the farmers mobile phones. For an easy, user-friendly approach, 'Krishi krithya' a mobile application was also developed. By using this application, the farmer will get all the details about his smart farming field in his finger tips.The introduction of this device has brought up an enormous change in agriculture by slashing the yield gap from 50% in conventional methods to 5%. Significant reduction in water and nutrient usage, lowering the carbon footprint associated with agriculture. e-Crop empowers with the power of predictive analytics, providing data-driven insights that can inform critical decisions throughout the growing season. The device is able to anticipate potential nutrient deficiencies before they become immense problems. This level of foresight allows for proactive measures that minimize crop losses and ensure a more sustainable future. e-Crop represents an innovative shift towards a future of eco-conscious agriculture. By promoting sustainable practices and environmental conservation, this innovative technology paves the way for a future where food security and agricultural prosperity go hand in hand.

Smart Fertigation System
The smart fertigation system is an advanced agricultural tool designed to deliver water and nutrients to crops with precision and efficiency. This system is controlled through an integrated e-crop platform, which continuously monitors and predicts the specific needs of the crops based on their growth stages and real-time weather data.The system ensures that water and nutrients are applied at optimal intervals, tailored to the precise requirements of each plant.

At the heart of this technology is an Internet of Things (IoT) based supervisory control unit that orchestrates the entire operation. This controller manages key components like the various pumps and solenoid valves through a relay module, which work together to achieve effective fertigation. The system is equipped with two pumps operating at 230VAC. The first pump draws water into the Mixing container, while the second pump delivers the mixed water with the necessary nutrient to the crops via a drip irrigation network. This method ensures that the water and nutrient mixture is applied directly to the roots of the plants, minimizing waste and enhancing absorption.

The nutrients, including Nitrogen, Phosphorus, and Potassium, are stored in separate containers. Based on the crop's specific needs at different stages of growth, these nutrients are mixed with water in a dedicated mixing container. This mixing process is guided by an AI-based growth model that considers various environmental parameters such as the amount of rain, temperature, direction and speed of the wind and humidity in the agricultural field. This ensures that each plant receives the right amount of nutrients at the right time, tailored to its current requirements.

Once the nutrient solution is ready, it is automatically routed to the appropriate crops through solenoid valves. This automation eliminates the risk of over- or under-fertilization, promoting healthy plant development and maximizing yield.

The smart fertigation system can be controlled remotely via a mobile network, providing farmers with seamless connectivity and the ability to monitor and adjust the system from any location. This remote control capability allows for timely interventions and adjustments, ensuring that the crops always receive the care they need.

H. Highlight selected start-ups established by students/faculties with mention of founder/cofounder name

- Name of the start-up : Unibotix Innovations Pvt. Ltd
- Sector or domain of operation : Robotics
- Products   : Ubo – An educational Robot
- Names of founders : Vishnu P Kumar (CEO), Milad Muhammed (CTO)

I. List if any break through Innovations / Technology Developed at the institute (2-3 technology with 2-3 lines about technology and innovation
IoT based Smart Farming -

Smart Waste Bin - The student team from CSE department - Bryan Bishi, Abraham A V and Jins Varghese bagged the First prize for CSI Inapp International Student Project Award for their project entitled " Smart Waste Bin". The team was guided by Mr. Praveen GL . This was a 6 month long process that involved selecting the best projects from the 200+ project

J. Participation of IIC-institute in various programs of Central and Stage Govt. Highlighting specially for the schemes or programs
- ARIIA – participation and Rank
  - o Institute have participated in ARIIA 2023 ranking
  - o Faculty Coordinator **: Ms. Lakshmy S,** Assistant Professor, Dept. of Electronics & Communication Engineering

- **NISP Adoption status** - Trained Faculty, Policy Formulation, Policy Implementation
  - o Faculty Coordinator: **Ms. Lani Rachel Mathew,** Assistant Professor, Dept. of Electronics & Communication Engineering
  - o Policy formation/Implementation Status : The Innovation & Start-up policy of MBCET has been approved by the NISP (National Innovation and Start-up policy) panel of the Ministry of Education.

- ATL Lnkage
  - IIC MBCET Choose 3 ATL Schools in Trivandrum

K. Detail of Social Media & Connections of IIC institute
- Facebook   : officialmbcet
- Instagram   : officialmbcet

- Twitter   : officialmbcet

L. Testimonials from IIC members and external about IIC institute and IIC of MoE's Innovation Cell

"As a member institution of the Institution's Innovation Council (IIC), our engineering college has greatly benefited from the structured activities and support provided by the council. The IIC has fostered a vibrant culture of innovation and entrepreneurship, enabling our students to engage in ideation, prototyping, and real-world problem-solving. Through workshops, hackathons, and mentorship from industry experts, our students have developed critical skills beyond the classroom, transforming their ideas into tangible projects. The collaborative environment has also strengthened cross-departmental teamwork, positioning our institution as a hub for innovative solutions in line with national goals like 'Atmanirbhar Bharat"

M. **Contact**

IIC President :   **Dr. M J Jayashree**, Professor and Dean Academics,
Mob ; +91 9349338747
Email : jayashree.mj@mbcet.ac.in

IIC Convenor :   **Mr. Jijo Jose**, Assistant Professor, Mob: +91 9567840685
Email : jijo.jose@mbcet.ac.in