

Government Engineering College Palakkad

Sreekrishnapuram, Kerala - 678633



**Report on Research & Development
(2022-2023)**

ABSTRACT

Government Engineering College Palakkad (GECPC) was established in 1999 at Sreekrishnapuram village of Palakkad. The college runs six undergraduate courses of study, namely Computer Science & Engineering, Electronics & Communication Engineering, Information Technology, Mechanical Engineering, Electrical & Electronics Engineering and Civil Engineering. Department of Computer Science and Engineering runs a postgraduate program in Computational Linguistics and Department of Mechanical Engineering offers a postgraduate program in Robotics. Over the past decades, GECPC has made a steady progress in terms of academic excellence, infrastructure and development of key subsystems. The College has got good infrastructure facilities such as smart class rooms, library, central computing facility, e-learning centre, laboratories & workshops equipped with machines and ancillaries comparable with industrial standards, seminar halls, open air auditorium and various amenities such as hostels (men and women), staff quarters, canteen, co-operative society etc. The institute has well established Student Counseling Cell, Entrepreneurship Development Club, National Service Scheme, Alumni Association and Parent Teacher Association. The student chapters of professional bodies like the IEEE, ISTE and the different clubs and forums offer a wide range of opportunities for students to nurture their talents thereby promoting their overall development and leadership qualities. The Research and Development (R & D) Committee under TEQIP II aims to nurture research culture in the College by promoting research in newly emerging and challenging frontier areas of Engineering and Technology. It encourages the students and faculty to undertake the research in newly emerging frontier areas including multidisciplinary fields. This enhances the general research capability of budding technocrats.

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Chapter 1

INTRODUCTION

Vision

Excellence through the wings of science and technology

Mission

To transform youth to talented engineers with creativity and integrity who can meet the technological challenges for the service of society

As embedded in the Mission and Vision statements of GEC Palakkad (GECP), the institution aims to provide quality education for transforming the students into talented and socially responsible technocrats. In the learning and growth perspective, the effectiveness of the education system offered depends on the opportunities for development of the primary stakeholders like students and faculty of the institution and the association/involvement/support of other stakeholders like industries, alumni, parents and community/society for this purpose.

The R & D committee was formed with an objective to encourage and promote cutting-edge research based on the proven capabilities and expertise of faculty and students. The Committee facilitates strengthening of the Institute's research capabilities; proactively promote basic research and monitor quality of research work done.

Chapter 2

R & D Initiatives

The objective of R & D Committee is to promote research activities among students and faculty as well as to provide a robust platform for sharing and implementing innovative and creative ideas to facilitate exchange of information and interaction among the various research institutes and industries to develop skilled manpower in various engineering fields.

2.1 Recommendations of Research Committee

- Informing the faculty members about various research schemes that are offered by the various government and other funding agencies.
- Encouraging faculty members to submit their research project proposals to the funding agencies.
- Providing financial assistance to the faculty members to publish/present research papers in journals/conferences.
- Promoting Research culture among the staff by conducting special sessions by eminent researchers in those areas.
- Encouraging faculty members to register for Ph.D.

2.2 Steps taken to Promote Research

The policy to promote research culture in the college is given below:

- As per the G.O.(Rt).No. 237/2021/HEDN Dated Thiruvananthapuram 08/02/2021, Government issued guidelines for the utilization of the four funds for ensuring the sustainability of TEQIP II initiatives.
- As per these guidelines students can purchase spares, consumables or tools not exceeding Rs.20000/- as incidental expenses for the course project or other technical/research purposes.

- Research seed money up to Rs.2 lakh can be sanctioned to the faculty members having 15 years or less service for the purchase of equipment/consumables etc.
- Research publication charges for journal publications are reimbursed to the faculty who has published their papers in reputed journals.
- MoUs with reputed institutes viz. IIT Palakkad, Integrated Rural Technology Centre (IRTC) repute. Faculty and students benefit from these MoU's as they are being exposed to enriched knowledge and real time experiences.
- The faculties are encouraged to apply for research grants to various funding agencies and Principal investigator/coordinator is given autonomy for executing projects.
- Motivate the students to write research papers, to do research-oriented project works and paper presentations at National and International level.
- Motivate the faculty members to visit the leading Institutions and consult subject experts to acquire new ideas in research.
- Industrial experts are invited to the institution for interaction with faculty and students to promote the industry need based research.
- Senior academicians from other institutions / universities are invited to share their expertise.

2.3 MoUs

The MoUs are aimed at enhancing cooperation between our institution and the respective institutions for student/faculty training, internships, projects, collaborative research and entrepreneurship promotion. GEC Palakkad has signed MoUs with the following institutions so far:

Sl No	Name of the organization	Type of collaboration
1	IRTC Mundur, Palakkad	Projects, internships, joint research
2	IIT Palakkad	Projects, internships, joint research, invited talks
3	TECHIN, IIT Palakkad	Projects, internships, joint research, entrepreneurship
4	K-Disc TVM	Innovation, startups, ODOI, YIP
5	ICT Academy Kerala	Internships, Students Training, Placement
6	Metal Industries Shornur	Projects, internships

SI No	Name of the organization	Type of collaboration
7	ICCONS Shornur	Internships, Students Training, Joint Research
8	NanoTech Dyanmics, Defence Park, Ottapalam	Internships, Students Training, Joint Research
9	Sastra Robotics, Infopark, Kochi	Joined research, internship, invited talks
10	ZestyBeanz, Technopark Trivandrum	students training, internships
11	Saron Innovature Labs, Sreekrishnapuram	Students Training, Joined Projects

2.4 Collaborative Research and Learning (CoRAL) Centre

Kerala is one of India's most progressive States in terms of social welfare and quality of life. The Government of Kerala which has initiated a number of schemes in various other sectors has recently adopted a firm stance in improving its higher education sector with prime focus on research. The State has consciously set aside considerable amount of funds in the recent budget for the enrichment of research and learning in the higher education sector.

In this juncture, this centre is aimed to bridge a conspicuous gap existing between the research produced by the academics in the academic institutions and problems in the society warranting intelligent, sustainable and environmental friendly technological solutions. There are a good number of central and state funded research institutes in almost all the districts of the state. Apart from these, there are several small and medium scale industries in many of the districts. The local issues of regions are handled by the local self-governments. Currently these agencies/institutes and the academia of the state function as two verticals with minimum interaction between them. This scenario needs urgent intervention whereby a centre can be established which acts as a link, facilitating a mutual give and take between research institutes, industries, LSGDs and Government missions on one side and academic institutions on the other. This is also expected to attract researchers to do more meaningful research, thereby spearheading their objectives to reach out to the society. It is in this context that CORaL can play a pivotal role. CoRaL pave the way for the seamless interaction between the academia of the state with other stakeholders which includes research institutes, industries, LSGDs and Government Missions in the state paving way to quick, intelligent, sustainable and environment friendly technological solutions to problems/issues in the society.

Chapter 3

Committee

As per the G.O.(Rt). No. 237/2021/HEDN Dated Thiruvananthapuram 08/02/2021, Government issued guidelines for the utilization of the four funds for ensuring the sustainability of TEQIP II initiatives. As per these guidelines students can purchase spares, consumables or tools not exceeding Rs.20000/- as incidental expenses for the course project or other technical/research purposes. Research seed money up to Rs.2 lakh can be sanctioned to the faculty members having 15 years or less service for the purchase of equipment/consumables etc. As per the guidelines, the institution shall form Research Guidance Committee (RGC) with eminent professors/scientists for strengthening/promoting the research activities in the institution, enhance industry interaction and to foster industry relevant research. The Research Guidance committee (RGC) provides support and guidance to faculty and students to take up research and innovative development relevant to industry as well as society.

The research guidance committee review the proposals submitted by the students/faculty and shortlists the proposals for sanctioning seed money. The maximum amount admissible for the Research Assistance, eligibility, terms and conditions etc shall also be finalized by the RGC. The committee shall offer guidance for submitting proposals for funded projects from various reputed agencies as well as guidance for accreditation as well as NIRF ranking.

The Research and Development (R & D) Committee under TEQIP-II is chaired by Principal and consists of the Research Coordinator, Heads of the departments, and senior faculty members of the College. R & D Committees monitor and address the issues of research in every department of the entire institute and recommend for the approval by the RGC. It provides advisory support in selecting the R & D proposals for implementing R & D activities through analysis of technological trends and identification of thrust areas.

The members of Research Guidance Committee of GECP are as follows:

Senior Research Advisor (SRA) : Dr. Ganesh Natarajan,

Associate Professor, Department of Mechanical Engineering,
IIT Palakkad

Chairperson : Dr. Meenakshy K , Principal

Members: Dr. Anitha R, Assistant Professor, ECE Department – Coordinator (R & D Committee)

Dr.Manesh K K, Professor, ME Department

Dr. Dhanya K M, Associate Professor, IT Department

Dr.Vinita Chellappan, Associate Professor, EEE Department

Dr. Swaraj K P, Associate Professor, CSE Department

Chapter 4

Achievements

4.1 Patent

- Dr Sangeetha U and Dr Remesh Babu K R granted Indian Design Patent on “Motion tracking-standing convertible computer desk” Patent no. 373308-001 dated October 31,2022 (**Granted**)
- Dr. A R Jayan granted US Patent on “Method and System for Consonant-Vowel Ratio modification for improving speech perception” **Patent no. US 10176824B2 dated January 8, 2019 (Granted)**
- Dr. Anitha R granted Australian Patent on “Inertial Measurement Unit for Wearable Continuous Human Motion Information System” **Patent no. 2020102947 dated January 13, 2021 (Granted)**
- Mr. Muhammedali Shafeeque K., Assistant Professor, EEE Dept has filed an Indian patent for his work on “A novel design for a rotary generator using triboelectric effect” (**Application no. 202041037140 Dated 28/08/2020**)
- Dr. Remesh Babu K.R. **filed patent on** "Portable Public Surveillance Device with an AI Driven Face Recognition Computational Module for Large Scale Community Policing" (**The Patent Office Journal No. 41/2020 Dated 09/10/2020**)
- Dr.Remesh Babu K R, Dr. Sangeetha U, Dr. A Selvakumar filed a patent on “A Real Time Automatic Intelligent System And Method For Wild Animal Monitoring And Counting Device Based On A Deep Convolutional Neural Network”. (**Application no. 202241013392 Dated 11/03/2022**)

4.2 Publications by faculty and students

The scholarly journal articles published in SCI/SCIE indexed, Scopus indexed journals and refereed journals and conferences in the academic year 2022-23 are as listed below.

Sl.No	Name of the Faculty	Department	Paper Title	Indexing
1	Dr. Meenakshy K	EEE	George, R., Jose, R., Meenakshy, K., Jarin, T., & Senthil Kumar, S. (2023). Effects of long-term exercise training on physiological signals and personality traits in women in law enforcement. <i>Journal of Intelligent & Fuzzy Systems, (Preprint)</i> , 1-13.	SCIE
2			Dadi, R., Meenakshy, K., & Damodaran, S. K. (2022, November). An adaptive PI based distributed control method to maintain accurate power sharing and voltage regulation in DC Microgrids. In <i>2022 IEEE 19th India Council International Conference (INDICON)</i> (pp. 1-8). IEEE.	Scopus
3			Dadi, R., K. Meenakshy, and S. K. Damodaran. "A review on secondary control methods in DC microgrid." <i>Journal of Operation and Automation in Power Engineering</i> 11, no. 2 (2023): 105-112.	Scopus
4	Dr. K R Ramesh Babu	IT	KG, P., Babu, K. R., Thomas, R. S., Walter, S., & Thomas, S. (2022). Price Forecasting on a Large Scale Data Set using Time Series and Neural Network Models. <i>KSIIT Transactions on Internet & Information Systems, 16</i> (12).	SCIE
5	Dr. Rani M R	IT	Philip, G., Rani ,M. R., & Subashini, R. (2023). On computing the Hamiltonian index of graphs. <i>Theoretical Computer Science</i> , 940, 149-179.	SCIE
6	Dr. P C Reghuraj	CSE	K. Anuja, P. C. R. Raj and R. B. K. R, "State-of-the-Art Methods for Fine-Grained Emotion Detection from Malayalam Text using Deep Learning: A Survey," 2022 3rd International Conference on Issues and Challenges in Intelligent Computing Techniques (ICICT), Ghaziabad, India, 2022, pp. 1-5, doi: 10.1109/ICICT55121.2022.10064583.	Scopus
7	Dr. Anitha R	ECE	Jaishankar, B., Anitha, R., Shadrach, F. D., Sivarathinabala, M., & Balamurugan, V. (2023). Music Genre Classification Using African Buffalo Optimization. <i>Computer Systems Science And Engineering</i> , 44(2), 1823-1836.	SCIE

Sl.No	Name of the Faculty	Department	Paper Title	Indexing
8			Rupashini, P. R., Poonkodi, R., Shadrach, F. D., Anitha, R., & Nirmalan, R. (2022, July). Diabetic Retinopathy Detection Using Retinal Fundus Picture and Image Enhancement Using Fuzzy Clustering. In 2022 International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICSSES) (pp. 1-7). IEEE.	Scopus
9	Vishnuprasad K	ECE	Archana M, Akshara S, Adithya J, Athira M J, Vishnuprasad K (2022). An Automated Face Mask Detection and Temperature Scanning with Fingerprint Attendance System. In International Conference on Intelligent Innovations in Engineering and Technology, Coimbatore	Scopus
10	Dr. Vinita Chellappan	EEE	Suresh, S., Peter, J., & Chellappan, V. (2022, July). Mathematical Modeling and Speed Control of 6/4 Switched Reluctance Motor Drive. In 2022 International Conference on Futuristic Technologies in Control Systems & Renewable Energy (ICFCR) (pp. 1-6). IEEE.	Scopus
11			Joy, J., Alpha, M. M., Anupama, V. M., & Chellappan, V. (2022, August). Dynamic Modeling and Current Control of a Solar Powered Battery Storage Systems. In 2022 2nd Asian Conference on Innovation in Technology (ASIANCON) (pp. 1-7). IEEE.	Scopus
12			Anees, A., Aslam, V. K., Drishya, K. V., Rasmi, K. R., Sulaiman, P. M., Chellappan, V., & Peter, J. (2022, July). Isolated Boost Converter and Inverter System for Domestic Applications. In 2022 International Conference on Futuristic Technologies in Control Systems & Renewable Energy (ICFCR) (pp. 1-5). IEEE.	Scopus
13			Narayanan, A., Athulya, P. C., Rahmath, T. A., Vismaya, A., Kurian, S., & Chellappan, V. (2022, August). SRM Motor Control using Conventional and Full-Order-Terminal SMC Controller. In 2022 2nd Asian Conference on Innovation in Technology (ASIANCON) (pp. 1-7). IEEE.	Scopus
14			Peter, J., & Ramchand, R. (2022). Investigations on variable and constant switching frequency hysteresis controller for VSI fed IM drive. International Journal of Power Electronics, 16(1), 61-79.	Scopus
15	Dr. Joseph Peter	EEE	Suresh, S., Peter, J., & Chellappan, V. (2022, July). Mathematical Modeling and Speed Control of 6/4 Switched Reluctance Motor Drive. In 2022 International Conference on Futuristic Technologies in Control Systems & Renewable Energy (ICFCR) (pp. 1-6). IEEE.	Scopus

Sl.No	Name of the Faculty	Department	Paper Title	Indexing
16	Dr. Joseph Peter	EEE	Anees, A., Aslam, V. K., Drishya, K. V., Rasmi, K. R., Sulaiman, P. M., Chellappan, V., & Peter, J. (2022, July). Isolated Boost Converter and Inverter System for Domestic Applications. In 2022 International Conference on Futuristic Technologies in Control Systems & Renewable Energy (ICFCR) (pp. 1-5). IEEE.	Scopus
17	Muhammedali Shafeeque K	EEE	Shaima, E. K., Sajeed, N., & Kormath, S. A. A. (2022, February). A New H-bridge Switched Capacitor Based Five Level Inverter. In 2022 IEEE Delhi Section Conference (DELCON) (pp. 1-6). IEEE.	Scopus
18	Ms. Sajitha M	IT	Sajitha, M., Kavitha, D., & Reddy, P. C. (2023). An Optimized Clone Node Detection in WSN Using Cuckoo Filter. SN Computer Science, 4(2), 167.	Scopus
19	Anoop S.K,M	IT	Anoop S K M, Jayalal Sarma, On Rotation Distance, Transpositions and Rank Bounded Trees 28th International Computing and Combinatorics Conference (COCOON 2022), Shenzhen, China in Oct 2022	
20			Anoop S K M, Jayalal Sarma, On Separating Words Problem On Groups 25th International Conference on Descriptive Complexity of Formal Systems (DCFS 2023), Postdam, Germany in July 2023 (Accepted)	
21	Dr.Silpa Sangeeth L. R	IT	Finger Print Based Vote Marking System For Elector Identification, First International Conference On Signal Processing, Computation, Electronics ,Power And Telecommunication IConSCEPT May 2023 @NIT Puducherry Karaikal	

Chapter 5

Funded Projects

5.1 Centre for Engineering Research and Development (CERD)

Centre for Engineering Research and Development (CERD) of Kerala Technological University (KTU) has provided a platform for faculty and students of the affiliated Engineering Colleges in the State to pursue their interest in applied research. Various schemes are implemented by the University to motivate, mentor and support Researchers. Necessary assistance is being provided to carryout research and translate innovative ideas to prototypes. The Centre acts as a catalyst to create an environment conducive to research and helps to enhance the research culture in the institutions.

CERD – College level unit

Centre for Engineering Research and Development is established by the Government of Kerala for the purpose of promoting engineering research. CERD unit and innovation centre offer funding for deserving student projects and for faculty. Good industry institute interaction and thereby exposure to the students are ensured from CERD funding. CERD is being coordinated by Mr. Vishnuprasad K from September 2021. The following project of GEC Palakkad was allotted the CERD funding for 2022-23 .

Name of Investigators	Name of student investigators	Branch	Title of the project	Sanctioned Amount
Dr. Joseph Peter, PI Dr. Vinita C, Co-PI	Sreenath U Athira R Sabna K I Haritha E S	EEE	Isolated DC – DC Converter fed space vector PWM modulated	47000

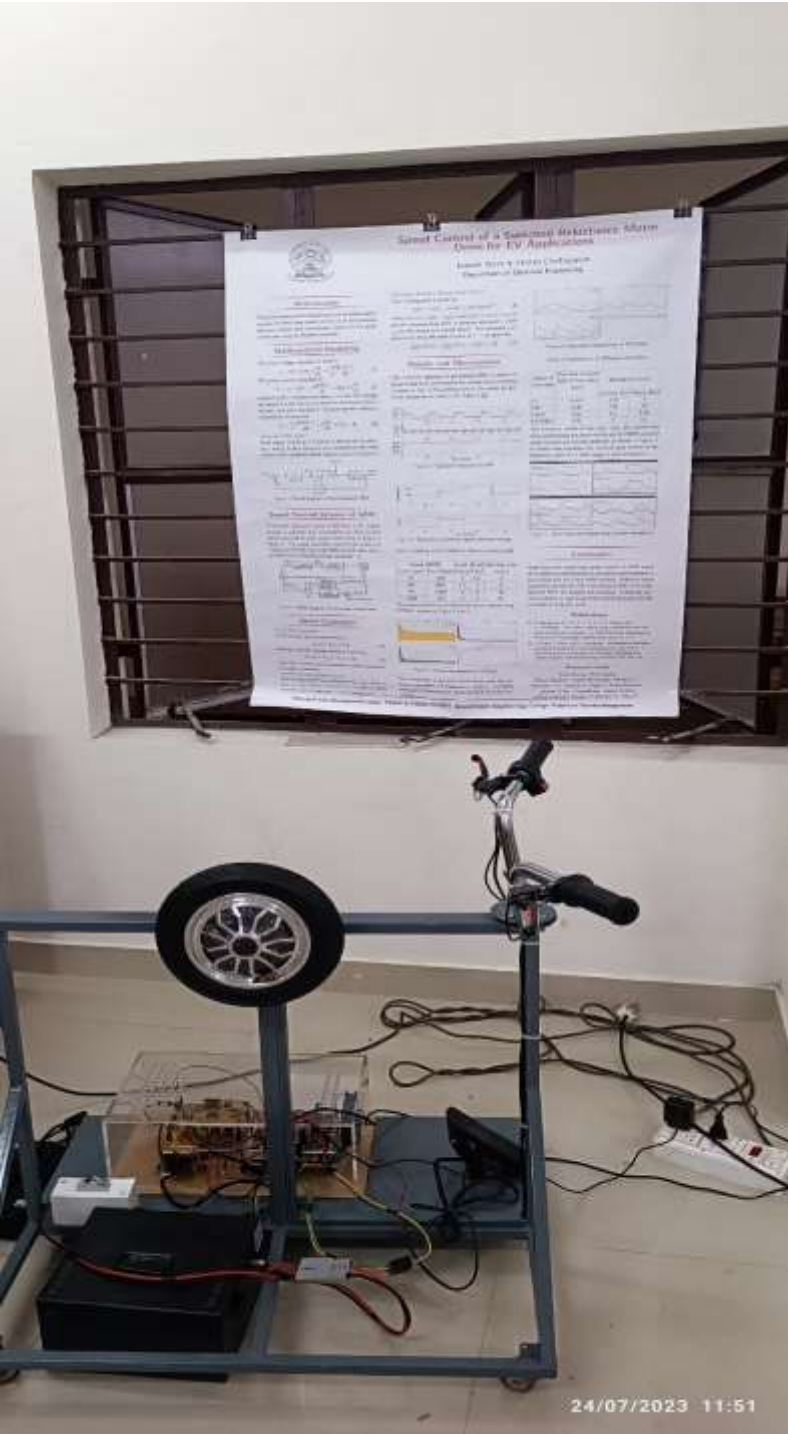
5.2 TEQIP Funded Projects

Following R & D project approved for availing the research seed money under TEQIP-II during 2022-23

Sl No	Project Title	Principal Investigator	Estimate Amount(Rs.)
1	Solar Powered Grid Connected Systems for Domestic Applications	Dr. Vinita Chellappan & Dr. Joseph Peter EEE Department	Rs.1,98,000
2	Speed Control of a Switched Reluctance Motor Drive for Electric Vehicular Applications.	Dr. Joseph Peter & Dr. Vinita Chellappan EEE Department	Rs.1,98,000
3	Design and Development of BLDC Hub Motor Drive and Controller for EV Bikes	Muhammedali Shafeeque K & Abdul Kareem P V, EEE Department	Rs.1,80,000
4	Implementation of Smart Meter Data Fetching IOT end device inco-operating Modbus Protocol	Muhammedali Shafeeque K & Muhammad Farooque E K, EEE department	Rs.1,85,000
5	Design and development of a 2-Axis MIG welding robot with Automatic Seam Detection Algorithm for Industrial Application	Prof.Navaneeth.M.S, AP ME Prof.Askkar Ali P, AP ME	Rs. 2,00,000/-
6	Hybrid Modular Dryer	Navaneeth.M.S AP-ME Sri.Sathyanath.V- Comp Pgmr ECE	Rs.50,000/-

Senior Research Advisor Dr. Ganesh Natarajan, IIT Palakkad and R & D Committee members evaluating the TEQIP funded projects





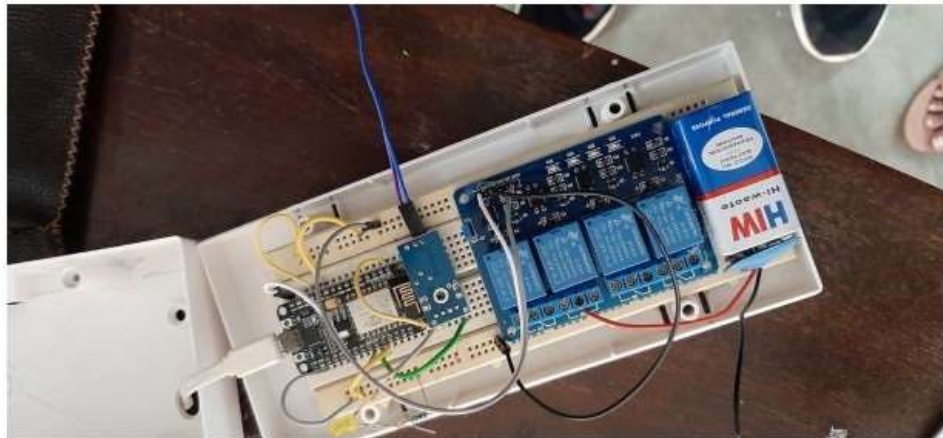
5.3 Unnat Bharat Abhiyan (UBA)

Government Engineering College is a participating institute in the UBA 2.0 since July 2020. The college has implemented projects. The main responsibility of a UBA cell is primarily to develop linkage with selective rural clusters, involve in the planning process and to promote the requisite S&T interventions to improvise and expedite the developmental efforts in those clusters.

College has selected the following villages for UBA activities.

Sr. No.	ADOPTED VILLAGES	TALUK(Block)	DISTRICT
1	Sreekrishnapuram-Ward-04	OTTAPPALAM	PALAKKAD
2	Sreekrishnapuram-Ward-05		
3	Sreekrishnapuram-Ward-06		
4	Sreekrishnapuram-Ward-07		
5	Sreekrishnapuram-Ward-08		

Students of GEC Palakkad developed Hydrosense, an efficient and ready-to-use automated irrigation system which can be controlled using a smartphone. This device can be used in apartments as well as in farm land. It can be integrated to an existing irrigation system in a farm land. Installation effort is minimal. Figure shows the working model of the hydrosense product. This product 'hydrosense' got selected to present at Unnati Mahatsav held at IIT Delhi during 17th and 18th of March 2023. The UBA coordinator Savyan P V, two students namely Fayis V P, Amjad and ward member Haridasan attended the program





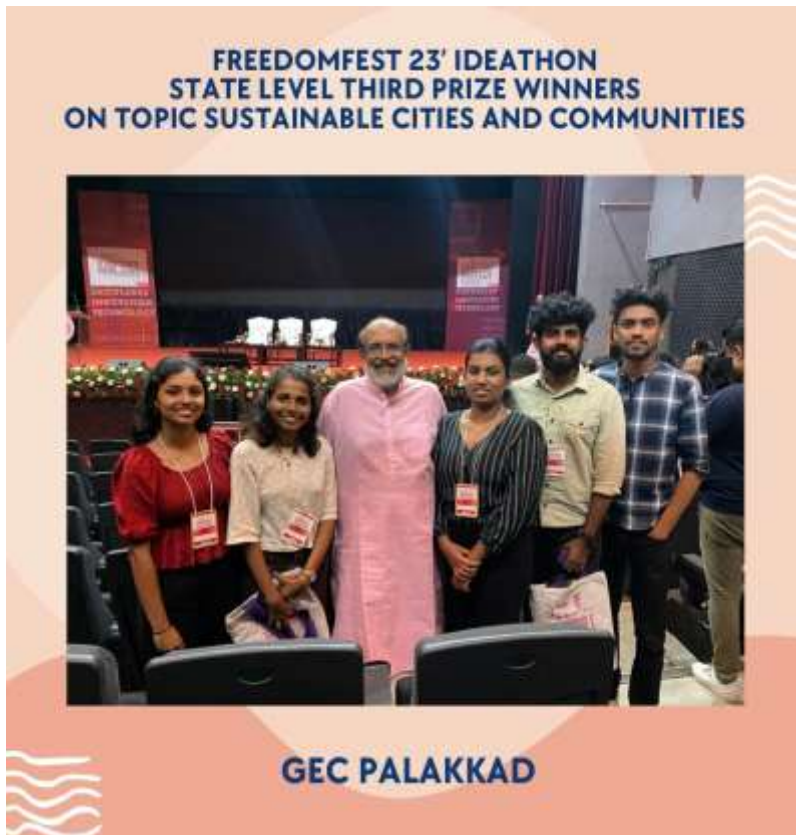
A house hold survey The survey gave some view into the various needs of the villages. The problem villages mentioned are like: Water scarcity, street light, stray dog issues etc.



5.4 Outstanding students' projects

FREEDOM FEST 2023

The Freedom Fest for Knowledge, Technology and Innovation, conceptualized as a large-scale event that brings together all those who stand against inequalities in access to knowledge IS organized in Thiruvananthapuram in August 2023 at the initiative of the Government of Kerala. The event will be coordinated by the Democratic Alliance for Knowledge Freedom, a leading organisation working in the field of knowledge freedom, KITE and K-DISC, and Kerala Start-up Mission, in collaboration with various other government, quasi-government, and academic institutions. **Seven Teams** from GEC Palakkad participated in state level freedom fest. GEC Palakkad students bagged state level third prize on the topic sustainable cities and communities.



GEC Palakkad students with Dr. T.M.Thomas Issac, Former Finance Minister and Chairman – Academic Committee



GEC Palakkad students bagged second position in the district level Ideathon at Freedom Fest 2023 organized by Government of Kerala for project titled Automated Mushroom Cultivation System

IGNITE 2023

IGNITE Program was started in 2020 by Darsana, a charitable organisation of global diaspora of engineers with varied expertise and experience. Key objective of IGNITE 2023 is the innovation and entrepreneurship competitions and challenges aimed at the student community to inculcate a culture of inquiry and seed thoughts on social enterprises. An innovative student project from ECE department – “Mobility Aid for Polio Affected People” guided by Prof. Hariprasad B received accolades in the program.



Rohit K and Team (B.Tech ECE 2019-23 Batch) presenting his project to Shri. K. Krishnankutty, Minister for Electricity in IGNITE 2023 Innovative and Entrepreneurship Challenge

അധ്യാപകന് ഗുരുദക്ഷിണ

വൈദ്യുത ചക്രക്കസേരയൊരുക്കി വിദ്യാർത്ഥികൾ

ശ്രീകൃഷ്ണപുരം എൻജിനീയറിംഗ് കോളേജ് വിദ്യാർത്ഥികളാണ് കസേര നിർമ്മിച്ചത്

ശ്രീകൃഷ്ണപുരം ▶ ഗോണ്ടികോയി വെള്ളവട്ടികൾ തേരിടുന്ന വൃത്തികടംകൾ യാത്ര സൗകര്യമേകുന്നതിനും, സ്കൂളുകൾ കൂട്ടുന്നതിനും, നൂതന സാങ്കേതികവിദ്യ ഉപയോഗിച്ച് വൈദ്യുത ചക്രക്കസേര നിർമ്മിച്ച് ശ്രീകൃഷ്ണപുരത്തെ ഗവ. എൻജിനീയറിംഗ് കോളേജ് വിദ്യാർത്ഥികൾ. മെമ്പർമാരുടെ നേതൃത്വത്തിൽ നിർമ്മിച്ച കസേര അധ്യാപകനായ പ്രൊഫ. ഹരിപ്രസാദിന് നൽകാനാണ് വിദ്യാർത്ഥികളുടെ തീരുമാനം.

എ.കെ.എ. ഇലക്ട്രോണിക്സ് ആൻഡ് കമ്പ്യൂട്ടറേഷൻ അവസാനവർഷ വിദ്യാർത്ഥികളായ കെ. ഹാസിൽ, ഷ.ആർ. അഹ്യാം, അശ്വതി സുധാൻ, മുഹ്സിന റഹ്മീൻ എന്നിവരാണ് ചക്രക്കസേര അമ്മാറകളായത്. പ്രൊഫ. ഹരിപ്രസാദിന്റെ മേൽനോട്ടത്തിൽ നടന്ന പ്രോജക്ടിന്റെ ഭാഗമായായിരുന്നു കസേരനിർമ്മാണം. ഇപ്പോൾ വിപണിയിൽ ലഭ്യമാവുന്ന ഇത്തരം ചക്രക്കസേരയ്ക്ക് രണ്ടുപക്ഷം രൂപയോളം വരും. എന്നാൽ, വിദ്യാർത്ഥികൾ 60,000 രൂപയോളം ചെലവഴിച്ചാണ് കസേര നിർമ്മിച്ചത്.

കസേരയിൽ യാത്രചെയ്യുന്ന വൃത്തികടം വഴിയിലുള്ള കയറ്റിറക്കങ്ങളിൽ ശരിക്കും മുന്നോട്ടോ പിന്നോട്ടോ ആയാടതെന്ന സമ്മതിക്കാനാവും. യന്ത്രത്തിലൊരുക്കിയ പ്രത്യേക സംവിധാനം വഴിയാണ് ഇത് സാധ്യമാവും. അതോടൊപ്പം സെൻസറുകളുടെ സഹായത്തോടെ പ്രവർത്തിക്കുന്ന ഓട്ടോമാറ്റിക് ബ്രേക്ക് സംവിധാനം അപകടസാധ്യത കുറയ്ക്കുന്നു. 24 വോൾട്ട് ബാറ്ററി ഉപയോഗിച്ചുള്ള രണ്ട് മോട്ടോറുകളുടെ പ്രവർത്തനം, പാതയിലുള്ള വസ്തു തിരിവുകളിലും യാത്ര എളുപ്പമാക്കുന്നു. കസേരയ്ക്ക് പെറ്റന്റ് ലഭ്യമാക്കുന്നതിനുള്ള ശ്രമം ആരംഭിച്ചതായി വിദ്യാർത്ഥികൾ പറയുന്നു.

ശ്രീകൃഷ്ണപുരം എൻജിനീയറിംഗ് കോളേജ് വിദ്യാർത്ഥികൾ നിർമ്മിച്ച വൈദ്യുത ചക്രക്കസേര

Students of GEC Palakkad bagged second prize for the Best Endurance Award for the e-bike developed by the students in the Dr.G.Padmanabham Memorial Electric Two Wheeler Design Competition 2023 held at Chennai.

എസ്എഇ ഇലക്ട്രിക് സ്കൂട്ടർ ഡിസൈൻ മത്സരം
അഭിമാനമായി ശ്രീകൃഷ്ണപുരം
ഗവ. എൻജിനീയറിങ് കോളേജ്



എസ്എഇയുടെ ഇലക്ട്രിക് സ്കൂട്ടർ ഡിസൈൻ മത്സരത്തിൽ എൻഡ്യറൻസ് മത്സര വിഭാഗത്തിൽ രണ്ടാംസ്ഥാനം നേടിയ ശ്രീകൃഷ്ണപുരം ഗവ. എൻജിനീയറിങ് കോളേജ് ടീം

ശ്രീകൃഷ്ണപുരം
സോഫ്റ്റ്‌വെയർ ഓഫീസ് ഓട്ടോമൊബൈൽ എൻജിനീയറിംഗ് സൗത്ത് ഇന്ത്യൻ ഫാക്റ്റി ഇലക്ട്രിക് സ്കൂട്ടർ ഡിസൈൻ മത്സരത്തിൽ തിളങ്ങി ശ്രീകൃഷ്ണപുരം ഗവ. എൻജിനീയറിങ് കോളേജ്. എൻഡ്യറൻസ് മത്സര വിഭാഗത്തിൽ രണ്ടാംസ്ഥാനം നേടി. 22, 23 തീയതികളിലായി ചേരുന്നതിലായിരുന്നു മത്സരം. ഓട്ടോമൊബൈൽ മത്സരത്തിൽ 38 കോളേജുകളാണ് അവസാന റൗണ്ടിൽ മത്സരിച്ചത്. കേരളത്തിൽനിന്ന് മൂന്ന് കോളേജുകളാണ് അവസാന റൗണ്ടിലേക്ക് യോഗ്യത നേടിയത്. വിദ്യാർത്ഥികൾ രൂപകൽപ്പന ചെയ്ത നിർമ്മിച്ചെടുത്ത ഇലക്ട്രിക് സ്കൂട്ടറാണ് മത്സരത്തിന്റെ മൂല്യമേടകം. ബസ്, ട്രെയിൻ, ടാന്നുവാണിലിറ്റി ട്രെയിൻ, ട്രെയിൻ ട്രെയിൻ, റോബിൻ ട്രെയിൻ എന്നീ പതിമൂന്നുവകുപ്പുകൾ വിഭജനം ചെയ്ത് പൂർത്തിയാക്കി ശ്രീകൃഷ്ണപുരം കോളേജ് എൻഡ്യറൻസ് മത്സര വിഭാഗത്തിൽ രണ്ടാമത്തെ അടിയന്തിരം. കേരളത്തിൽ എൻജിനീയറിംഗ് മേധാവി ഡോ. അബ്ദുൾ സലീം, കോ-ഓർഡിനേറ്റർ പ്രൊഫ. നവനീൽ, വിവിധ ഗ്രാന്റുകളിൽ നിന്നുള്ള 10 വിദ്യാർത്ഥികൾ എന്നിവർ ചേർന്നുള്ള ഗ്രൂപ്പാണ് മത്സരത്തിൽ പങ്കെടുത്തത്. കേരളത്തിൽ വിദ്യാർത്ഥികളുടെ അധ്വാനം, വർക്ക്ഷോപ്പ് ലാബ് ജീവനക്കാരെ എന്നിവയും നിർമ്മാണത്തിന്റെ വിവിധ ഘട്ടങ്ങളിൽ പങ്കെടുത്തു. പ്രീൽ സിക്സ് ഡോ. മീനാക്ഷി നേതൃത്വം നൽകി. ലോകത്തിന്റെ വിവിധ ഭാഗങ്ങളിലുള്ള എൻജിനീയറിംഗ് വിദ്യാർത്ഥികളുടെ വാഹനങ്ങളോടുള്ള താല്പര്യം വർദ്ധിപ്പിക്കാനുള്ള കൂട്ടായ്മയാണ് സോഫ്റ്റ്‌വെയർ ഓഫീസ് ഓട്ടോമൊബൈൽ എൻജിനീയറിംഗ് (എസ്എഇ).



Chapter 6

Collaborative Research and Learning (CoRAL)

Kerala is one of India's most progressive States in terms of social welfare and quality of life. The Government of Kerala which has initiated a number of schemes in various other sectors has recently adopted a firm stance in improving its higher education sector with prime focus on research. The State has consciously set aside considerable amount of funds in the recent budget for the enrichment of research and learning in the higher education sector.

In this juncture, this centre is aimed to bridge a conspicuous gap existing between the research produced by the academics in the academic institutions and problems in the society warranting intelligent, sustainable and environmental friendly technological solutions. There are a good number of central and state funded research institutes in almost all the districts of the state. Apart from these, there are several small and medium scale industries in many of the districts. The local issues of regions are handled by the local self-governments. Currently these agencies/institutes and the academia of the state function as two verticals with minimum interaction between them. This scenario needs urgent intervention whereby a centre can be established which acts as a link, facilitating a mutual give and take between research institutes, industries, LSGDs and Government missions on one side and academic institutions on the other. This is also expected to attract researchers to do more meaningful research, thereby spearheading their objectives to reach out to the society. It is in this context that CoRAL can play a pivotal role. CoRAL pave the way for the seamless interaction between the academia of the state with other stakeholders which includes research institutes, industries, LSGDs and Government Missions in the state paving way to quick, intelligent, sustainable and environment friendly technological solutions to problems/issues in the society.

As per order No L5/6422/23/DTE (IV) a total amount of RS 1,04,000/- was sanctioned to initiate various Collaborative Research and Learning (CoRAL) activities for the AY 2022-23. As per AS obtained from DTE, five different CoRAL activities were organized and the detailed expenditure statement is given as below.

Sl No	Particulars	Expenditure Permitted	Actual Expense
1	Interaction with local institutions (2 institutions)	15000	15050
2	Workshop (2 Workshops)	40000	40,004
3	Field visit	15000	16640
4	Hackathon	20000	23614
5	Student challenge	10000	6450
6	Miscellaneous	4000	4000
	TOTAL	1,04,000	1,05,758

6.1 CORAL PROGRAMS

1. FIELD VISIT

Third year students of ECE department visited Integrated Rural Technology Centre (IRTC), Mundur. IRTC envisions the upliftment of the underprivileged sections of the society through knowledge sharing, appropriate technology transfer and skill development. The institution intervenes to meet the new age challenges and find sustainable solutions in the sector of solid waste management, watershed development, energy management, local planning and livelihood. IRTC has played a pivotal role in handholding the local self-government institutions across the state through their project implementation and consultancy support for preparing Detailed Project Reports for various developmental programmes. IRTC has extensively involved in research, innovation and extension activities to empower the marginalized communities across the state. GEC Palakkad has MoU with IRTC Mundur



First year students of ECE department visited Institute for Communicative and Cognitive Neurosciences (ICCONS) is an autonomous not-for-profit neuroscience speciality hospital & research institute established under Health and Family Welfare Department, Government of Kerala. ICCONS aims to scientifically diagnose, treat and rehabilitate congenital or non-congenital intellectual and linguistic diseases such as autism, cerebral palsy, dementia, learning disabilities, non-infectious cerebral and neurological paralysis and dementia. ICCONS is the only institution in India with facilities for the treatment, rehabilitation and research of cerebral neurological disorders and diseases. GEC Palakkad has MoU with ICCONS.



2. WORKSHOP

a) WORKSHOP ON BLOCK CHAIN

Event Goal : Blockchain Workshop

Start Date & Time : 23rd of March 2023 at 10:00 AM

End Date & Time : 23rd of March 2023 at 3:30 PM

Coordinators : Dr. Silpa Sangeeth L R, Associate Professor, IT Dept

Platform/Venue : Government Engineering College Sreekrishnapuram

Event Type

(Technical/Non-Technical/ Humanitarian/ Membership development) : Technical

Guest/Speaker(if any) : Sosu Alex and Gopikrishna M

No. of IEEE Members Attended 2

No. of Non-IEEE members attended 38

The “Blockchain Workshop” was conducted by IEEE SB GEC Palakkad under CORal – Collaborative Research and Learning Platform in association with IEEE SB GEC Palakkad. The session was handled by Sosu Alex, Blockchain Architect, EY and Gopikrishna M, Founder & CEO, Promenant Innovation Labs Pvt Ltd. Sosu Alex, started the session by giving a brief introduction to Blockchain Technology and its various applications. She discussed how crypto assets are becoming prominent in the current scenario. Later she deep-dived into the underlying Blockchain technologies, discussing blocks, signature, hashing, nonce, etc. She demonstrated how the blockchain network is cryptographically secure with hashes and various hashing methods. Finally, there was a hands-on session on solidity in

Remix IDE. The session wined up with the creation of individual custom tokens by the participants. The following session was handled by Gopikrishna, who majorly focused on the wide variety of applications where Blockchain could be used. He unleashed the potential of Blockchain in sectors from agriculture to supply chains. He stressed the business use cases of the technology and how it could be a game changer. The concept of decentralization and transparency was properly conveyed to the participants and he claimed that Blockchain is the apt technology for implementing them. Overall, the workshop helped in building aptitude and curiosity among participants towards this revolutionary technology. The speakers did a great job of explaining complex terminologies and technologies underlying blockchain. Participants actively coded in the hands-on session and their doubts were clarified by the resource persons.





b) WORKSHOP ON 3 PCB & 3-D MODELLING

Start Date & Time - 23/03/23, 10.00 AM

End Date & Time - 24/03/23, 10.00 AM

Venue - Government Engineering College, Palakkad
Studio hall EEE Department

Demographics -

Total no. of participants - 60

Number of IEEE members - 6

Number of non-IEEE members – 54

PCB & 3-D MODELLING WORKSHOP was conducted on behalf of IEEE IAS GEC PALAKKAD under CORaL- Collaborative Research and learning platform in association with IEEE IAS SBC PKD. The 2 days session was handled by Anuraj N Founder & CEO Saron Innovature Labs LLP. The mentor was Sourav S8 ECE Department GEC PALAKKAD .The workshop focused on designing of PCBs by the delegates and familiarisation of 3-D MODELLING. All the delegates were given laptops to work on individually. Session started by providing a small introduction about the software requirements and tools for designing PCB. The delegates were then provided with some circuits to design themselves and the design was verified by mentor. These were saved in PDF format. On the second day mentor started by providing basic idea about 3- D MODELLING and software required for doing modelling.The workshop was very interesting and useful for the students to learn more about PCBs.



PCB & 3-D Modelling Workshop

A 2 day workshop on PCB designing and 3-d Modelling using CAD software.

23rd & 24th March

Sharpen your designing and modelling skills through this guided workshop led by **Anuraj N.**, Founder & CEO, **Saron Innovature Labs LLP.**

For any queries contact:
SANJU 9495951143
RENY 9497447195

REGISTER NOW

Follow us on social media: @saroninnovature

Logos: CORaL, IEEE



3. FIELD VISIT

ATTAPPADY VISIT

Students of GEC Palakkad including 3 staffs visited 2 villages of Attappady to know about the living conditions of the native residents in the villages and to understand the technology possibilities for the



upliftment of tribal areas. The visit was conducted as the beginning of an ‘Immersive internship through a survey of facilities available at Attappady Tribal village Palakkad’. The team visited the villages Anavaayi and Kavundikkal on 2nd and 3rd February 2023.

On the first day of the visit the team visited the village of Kaavundikal and examined their lifestyle and hygiene. The water from the river, the only available source of water, was collected for examination. The team further visited the school which was found to be sufficiently developed and only lacked the proper disposal of menstrual pads.

On the 2nd day the team visited the village of Anavaayi which was much more devastating. the natives had no proper electric connectivity or transportation facility. Solar panel facility was available in the village, but due to the lack of sufficient sunlight the facility could not meet the requirement. Collapsing

on the nearby hanging bridge brought the people to a terrible situation of relying on private jeep transport which is very expensive. The availability of pure water is also questionable. No sufficient protection has been provided from wild animals. Menstrual hygiene is also very terrible in the village.



4. MATRIX'23 - HACKATHON

Event Goal	Hackathon
Start Date & Time	22nd of March 2023 at 10:30 AM
End Date & Time	23rd of March 2023 at 3:30 AM
Coordinators	Dr. Vinita C, Associate Professor, EEE Department
Platform/Venue	Government Engineering College Sreekrishnapuram
Event Type	
(Technical/Non-Technical/ Humanitarian/ Membership development)	Technical
Host OU	
Guest/Speaker(if any)	
No. of IEEE Members Attended	2
No. of Non-IEEE members attended	22

'MATRIX' The hackathon organized by IEEE SB GEC PKD under the Collaborative Research and Learning Platform- CORaL, in association with IEEE CS SBC GEC PKD, was a great success. The event was held on 22nd and 23rd March 2023 and saw participation from 24 individuals, including 2 IEEE members and 22 non-IEEE members. The hackathon focused on developing solutions to improve Sustainability. Participants worked in teams to develop a working prototype within 24 hours, and the teams were judged based on their innovativeness, feasibility, and effectiveness in addressing the problem statement. The coordinators, Viswanatha Kartha V and Pavan G Nair provided round-the-clock support and technical assistance to ensure that the teams could focus on developing their solutions.



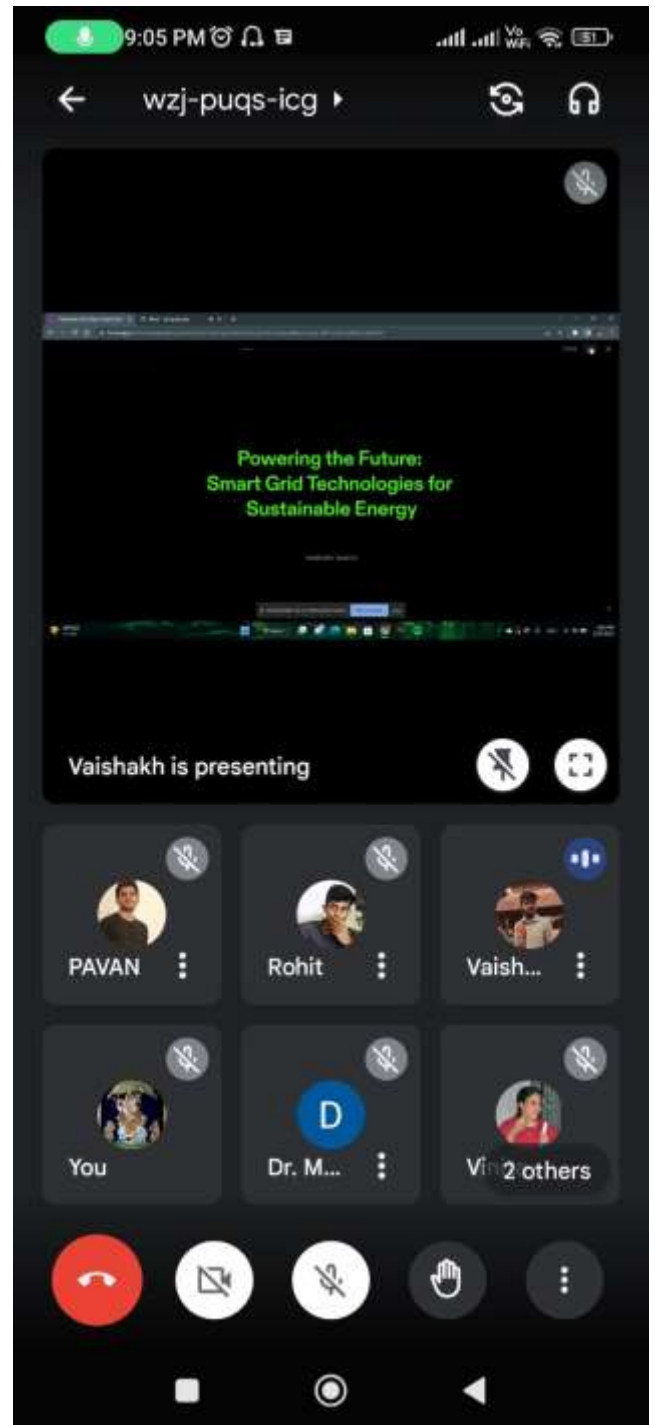
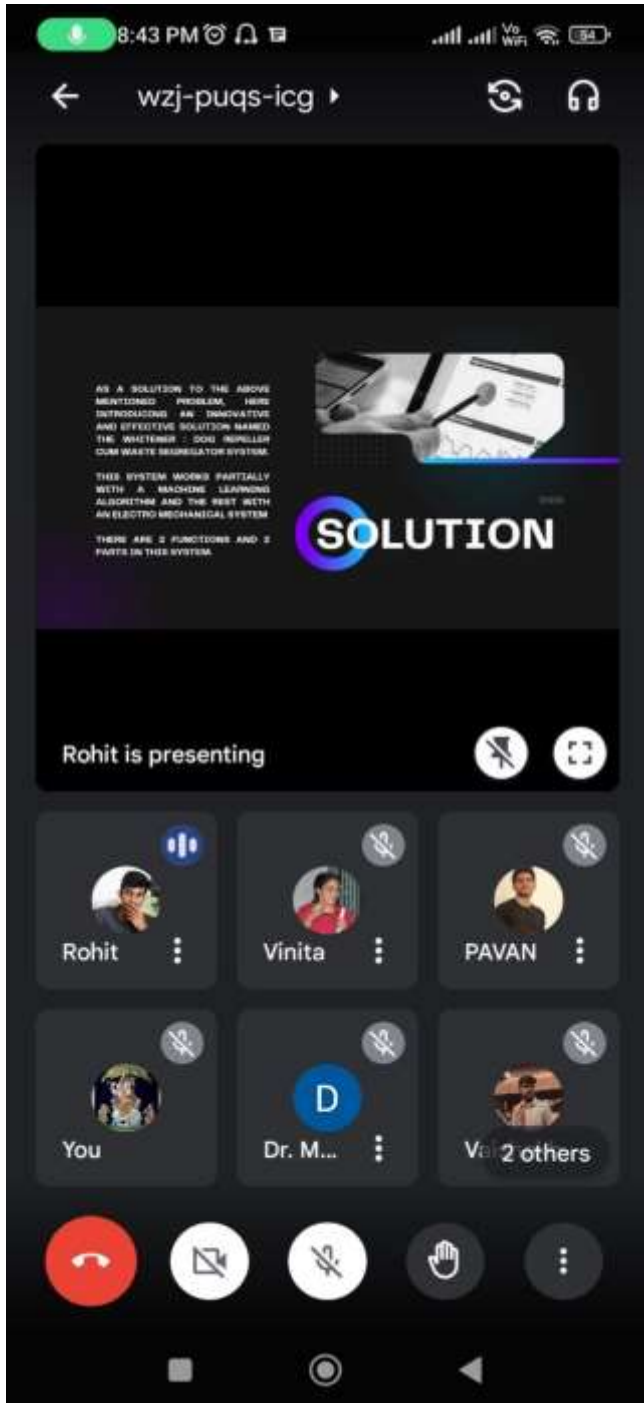
5. STUDENT CHALLENGE

Student Challenge is a focused form of innovation that encourages creative solutions to a

particular desire, concern, or area of improvement. Students from various institutions across the state were allowed to participate in the challenge to present the problems or issued identified within the institution/locality that could be solved by appropriate technological interventions.



The event had 10 participants from various colleges. The online competition was judged by the judging panel consisted of Dr. K Meenakshy, Principal, Dr. Vinita Chellappan and Dr. Anitha R. Rohit K, Final year ECE student of GEC Sreekrishnapuram bagged the first prize in the challenge for the concept “Dog repeller cum waste segregator system” to curb the dog menace which is prevalent in the Stste.



Chapter 7

Technology Business Incubator (TBI GEC Palakkad)

Technology Business Incubator (TBI) is one of the flagship projects of Govt. Engineering College, Palakkad. The facility provides infrastructural, academic and technical support to upcoming entrepreneurs to full fill their dreams. The team of academicians, industry experts and mentors provide the necessary guidance and motivation to create the pathway to success for anyone who steps into the facility. TBI is committed to inculcating the knowledge and skills to foster young engineers to become successful entrepreneurs, providing employment, developing innovative products and services and thereby building up an indigenous self-reliant nation. Within the last six years, TBI at GEC Palakkad was able to set up Infrastructure to hold 8 physical incubation units, a seminar hall, a mini fabrication lab and an amenity area for the incubates. It also provides basic IT infrastructures like Personal Computers, sharable Printers, high-speed Internet services, Mini fabrication lab etc.

Currently, a single firm M/s. TeQlot Innovations is working at TBI and the firm is completing tenure this year. All other firms dropped out for trivial reasons. Opting for higher studies and lack of seed funds is the reason for disengagement. M/s. TeQlot Innovantz was the only firm that conducted its business throughout the pandemic period. They have launched an array of new products and sustained in the market throughout the year.

GEC Palakkad got the opportunity to participate in several offline and online programs hosted by prestigious institutions like IIT Palakkad, IIT Karaghapur, HAL-IISc. Bangalore, DIC-Palakkad, MSME-DI Trissur and many more. Students participated IEDC Summit, IEEE events and Hackathon hosted by various institutions at the state level and national levels. Students also participated in MSME IDEA Hackathon 2.0 for seed funding. To enhance the skills and employability we conducted Induction Program for pre-final and final year BTech students of all branches of our institution on Entrepreneurship and the various government initiatives for the promotion of the startup ecosystem. The important activities held under TBI for AY 2022-23 are mentioned as follows

a) **Scaffold 2023**



Three days district level resident workshop “Scaffold 2023” for Higher secondary students under the Samagra Siksha Kerala by the Department of General Education, Govt. of Kerala was conducted at GEC Palakkad in association with BRC Cheruppalasserry, Palakkad Kerala. TBI associated with the program and conducted sessions to imbibe scientific temper and develop entrepreneurial skills in the youth of society.

b) **Internships for ITI students**



To nature skill full artisans by inculcating quality education and hands-on experience is one of our primary objectives. To execute this TBI in association with M/s. TeQlot weeks intensive training program for Industrial Training Institute students as a part of their Internship program. The syllabus covered basic

industrial safety to core domain topics in electronics and software development. The feedback indicates that the program gave an overview and experience of how various products are designed & developed in the industry. Forty students from PKM ITI, Kottappuram, Kerala participated in the program.

c) Achievements

- Miss. Anjima Prabhakar of the EEE branch successfully completed 10-day residential program Women Entrepreneurship Program (WEP) conducted by Kerala Institute for Entrepreneurship Development, (KIED) at Kalamassery, Kochi, Kerala from 15-22 November 2022.
- Science and Engineering Research Board (SERB) and the Indian National Academy of Engineering (INAE) Kanpur chapter jointly conducted the program “Atmanirbhar Technologies: Engineering a secure future.” Three students of the ECE branch participated and presented their idea in the SERB-INAE CONCLAVE held at IIT Kharagpur. The idea is on a novel haptic technology named DATSAT which is an acronym for Detection, Analysis and Transfer of Smell and Touch. The team developed and modelled the idea with the help of the TBI facility at GEC Palakkad



SERB INAE CONCLAVE two-day national level conclave at IIT Kanpur

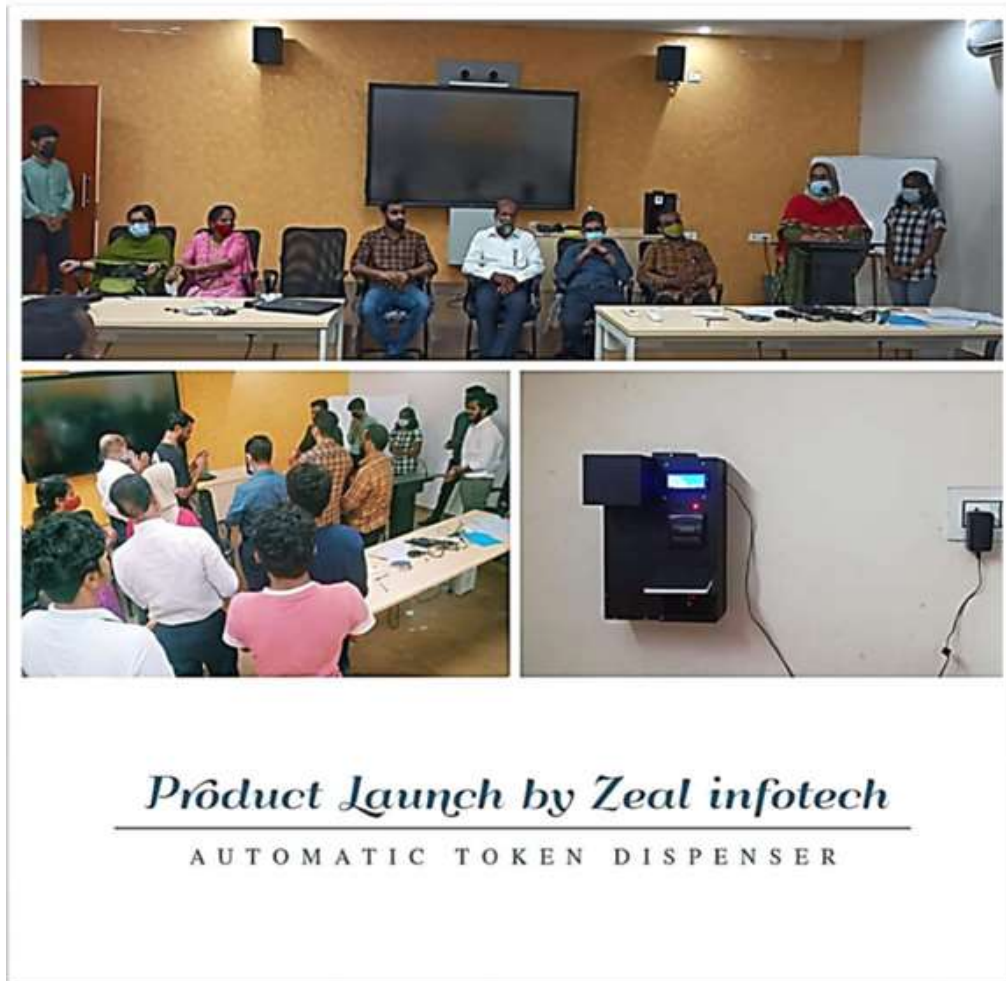
- Viswanath Kartha of Second Year B.Tech (IT) along with his mentor Mr. Sathayanath V, Computer Programmer received **Rs.15 Lakhs grant** for the entrepreneurial idea “ Real time LPG monitoring and automated booking system” in the **MSME hackathon 2.0**.

Government of India
 Ministry of Micro, Small & Medium Enterprises
announces results of
MSME IDEA HACKATHON 2.0
11 innovative ideas out of 276 ideas from PAN India got selected from State of Kerala

Institute Name	Innovative Idea
Sreepathy Institute of Management And Technology, Palakkad	IoT based greenhouse hydroponic system using solar
Government Engineering College, Thrissur	Phoenix- Drone based solution for human- wild life conflict
Maker Village, Ernakulam	Agro Farming Robot
	IoT based blood bag monitoring system
	Development of Electric Backrest With Additional Features of Communication
	Aluminum Air Battery-Hydrogen Fuel cell Hybrid system for EVs
	FM RDS - Disaster Warning Broadcast System
Indian Institute of Information Technology Kottayam	Lifebed - Cost effective replacement for medical beds with added bedsore prevention and patient tilting feature
IES College of Engineering, Chittilappilly	Energy Production optimization by block-chain based positioning of solar panels
Government Engineering College, Palakkad	Real-time LPG monitoring and automated booking system

The selected ideas will be receiving Rs.15 Lakhs/ idea for development in to prototype from Ministry of MSME

d) **Product Launch**



Product Launch by M/s. Zeal

On 05th August 2022, M/s. ZEAL launched their debut product “An IoT-based automated token dispenser” for hospitals and other public facilities for crowd management and maintaining social distancing.

e) **Idea Pitching, Hackathon etc.**

Sl. No	Title of Program	Organized by	No. of Participants
01	MSME Idea Hackathon 2.0	MSME Govt. of India	11

MSME Idea Hackathon is an initiative of the Ministry of Micro Small and Medium Enterprises (MSME) Government of India, conducted at the national level. The benefits include financial assistance of up-to ₹ 15 lakh per approved idea for developing and nurturing of the idea into a prototype. As the host institution of MSME in Palakkad district GEC Palakkad hosted the event and conducted the preliminary scrutiny of the contestants'. Thirteen teams were registered out of which 11 are from our institute itself. The procedures were completed and the results were uploaded to the MSME portal within the stipulated time.



f) TBI Drive 2023

We have conducted a screening test “TBI Drive 2023” for selecting potential incubates for the vacant slots at the facility TBI Screening Interview was conducted on 29-03-2023 at Edusat conference hall, GEC Palakkad. Applications were invited through our website, media, newspapers and notice boards of various Govt. institutions. 14 teams registered and pitched their idea to the screening committee of TBI, GEC Palakkad. The selection committee is constituted by the Principal, TBI Coordinator, HoDs of various departments (Domain Experts), Manager of Nationalized Bank (Financial Expert), and Extension Officer – Dept. of Industries and Commerce, Govt. of Kerala. The competition was tight and most of them come up with promising ideas which can impact the market and simplify our everyday life. Seven teams were selected and invited to start their venture at our incubation facility.





g) Firms selected for incubation 2023

Sl.No	Name of the CEO	Description of the project/product
1	Miss. Anjima Prabhakar	Lift App
2	Miss. Sreelakshmi M	LIMS using FOSS
3	Mr. Vishnu B	Shredator Waste Mgt.
4	Mr. Gireesh T	Cloth drier
5	Mr. Since Joy	Forest fire preventer
6	Miss. Amritha T Unni	Holosync
7	Mr. Ajith P	Hybrid induction cooker

Chapter 8

CONCLUSION

For any education, and technical education in particular, the basic model of a ‘teaching – only’ institution is inadequate to ensure quality education. In all disciplines of technical education, knowledge is dynamic with new technologies being introduced very frequently. In this scenario, it is not possible for the teachers to deliver good quality instructions without being tuned to the current developments in the subjects, for which they must constantly update their knowledge. A well-recognized way to deal with this paradigm is for the teachers to be active researchers in the areas in which they teach and exhibit a very high correlation between quality teaching and R & D activities. GEC Palakkad recognized the importance of R & D in the vertical growth of the institution and committed to focus on the scientific and industrial research in the various disciplines of Engineering. The R & D committee of GEC Palakkad encourages the students and faculty to undertake the research in newly emerging frontier areas of Engineering and Technology. This enhances the general research capability of budding technocrats. Students are motivated to undertake both in-house and industry-based projects. R & D committee of GEC Palakkad is successful in enhancing the quality publications of faculty and students in peer reviewed journals and conferences. Committee successfully implemented innovative products developed by students to meet societal challenges. R & D committee GEC Palakkad is committed to foster *Atma Nirbhar Bharat*, and **Make in INDIA** through Industry partnerships.