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Research & Enterprise Ecosystem Handbook:
Services, Equipment, and Expertise



INFLUENCING
the FUTURE



RIET

Research Institute for Engineering and Innovative Technology



RIEIT



SET Building

The Research Institute for Engineering and Innovative Technology (RIEIT) responds to the challenges posed by globalization and the internationalization of education and research. MSU-IIT is actively pursuing

Research Institute for Engineering and Innovative Technology

and the implementation of entrepreneurship-focused programs.

The Research Centers of RIEIT, each of which is multidisciplinary/interdisciplinary in nature, play pivotal roles, including the (i) Center for Sustainable Polymers; (ii) Center for Sustainable Construction Technology; (iii) BioProcess and BioResources Engineering Research Center;



(iv) Integrated Circuit Design Center; (v) Center for Energy Research and Technology; (vi) Center for Mechatronics and Robotics; (vii) Center for Artificial Intelligence Research; (viii) Center for Structural Engineering and Informatics; (ix) Center for Remote Sensing and Geographic Information Systems; (x) Bamboo Technology Research Center; (xi) Resource Processing Technology Center; and (xii) Research Center for Advanced Ceramics.

MSU-IIT Engineering, in collaboration with other academic units, is striving to evolve into a research intensive discipline dedicated to top-tier education and sustainable progress. Despite obstacles, it has been actively engaged in pioneering research, predominantly backed by external entities such as CHED, DOST, and esteemed foreign partners like USAID STRIDE and UK NERC. These partnerships not only fund research endeavors but also offer scholarships and training in technology commercialization, entrepreneurship, and IP management.

Now, MSU-IIT Engineering is poised to introduce the **RESEARCH INSTITUTE FOR ENGINEERING AND INNOVATIVE TECHNOLOGY (RIEIT)**, boasting significant funding, state-of-the-art facilities, and robust collaborations. Over the last decade, we've amassed approximately P721 million for research initiatives, converting laboratories into cutting-edge research hubs, commercializing four innovations, filing twenty-two patents, and garnering support from various sectors including industry, government, and global collaborators. With our highly dedicated faculty and a proven track record of excellence, RIEIT represents the natural progression for our vibrant engineering community.



The Center for Sustainable Polymers (CSP) pioneers advanced sustainable polymeric materials processing and characterization, offering innovative solutions for businesses' critical materials challenges. Focused on research, CSP aims to boost the knowledge-based economy by developing principles, protocols, and products supporting the tech-driven market in the Philippines. Through lab and pilot-scale processing and expertise

CSP

Center for Sustainable Polymers

in various disciplines, CSP accelerates product development from lab to market, serving industries, higher education institutions, and the community. It comprises four major research laboratories: Environmental Polymers Lab, Polymer-Nanotechnology Lab, Biomedical Engineering Lab, and Industrial Products Lab, along with shared facilities like the Analytical Facility and Machining and Fabrication Workshop.



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SuRER CMT

The Sustainable Resource Engineering Research Center for Construction Materials & Technologies (SuRER CMT) focuses on developing environmentally friendly solutions for the construction industry, promoting renewable materials and minimizing waste. It aims to establish the University as an innovation hub, contributing to the Philippines' global significance. By delivering affordable, competitive, and sustainable construction materials, it enhances the country's economy.

Its objective is to develop sustainable construction materials and technologies, utilizing agro-industrial wastes. This promotes circularity and protects human and environmental health. Specifically, it aims to: serve as an innovation

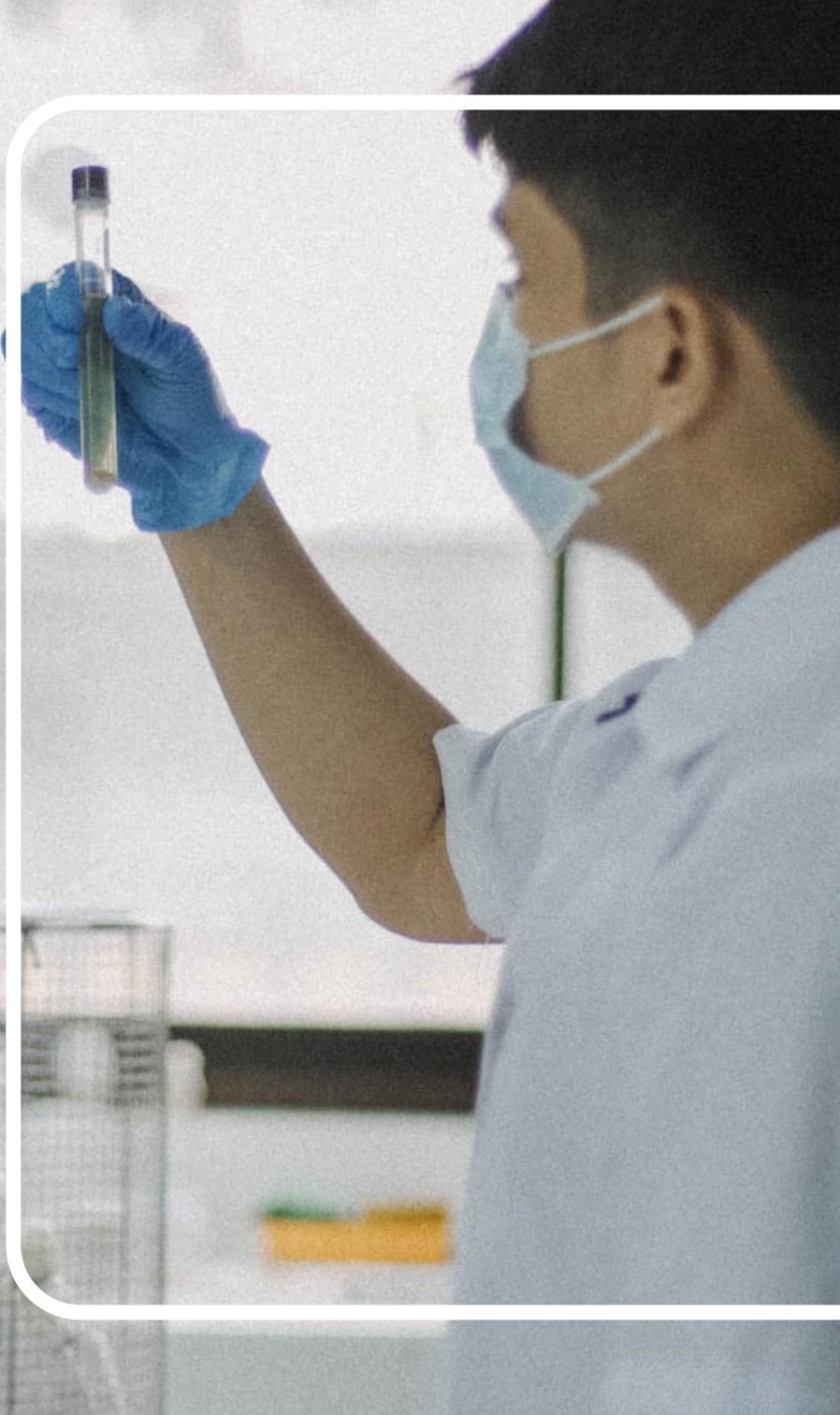
Sustainable Resource Engineering Research Center for Construction Materials & Technologies

lab for sustainable infrastructures; advance knowledge in Construction Materials Technologies; and enhance industrial competitiveness in waste utilization.

The CSCT comprises three Research Laboratories and a common Analytical and Characterization Laboratory: (i) Construction Admixtures and Formulations Research Laboratory; (ii) Construction Materials and Structures Research Laboratory; (iii) Bio-based Construction and Building Materials Research Laboratory; and (iv) Construction Admixtures and Materials Characterization and Analytical Laboratory.



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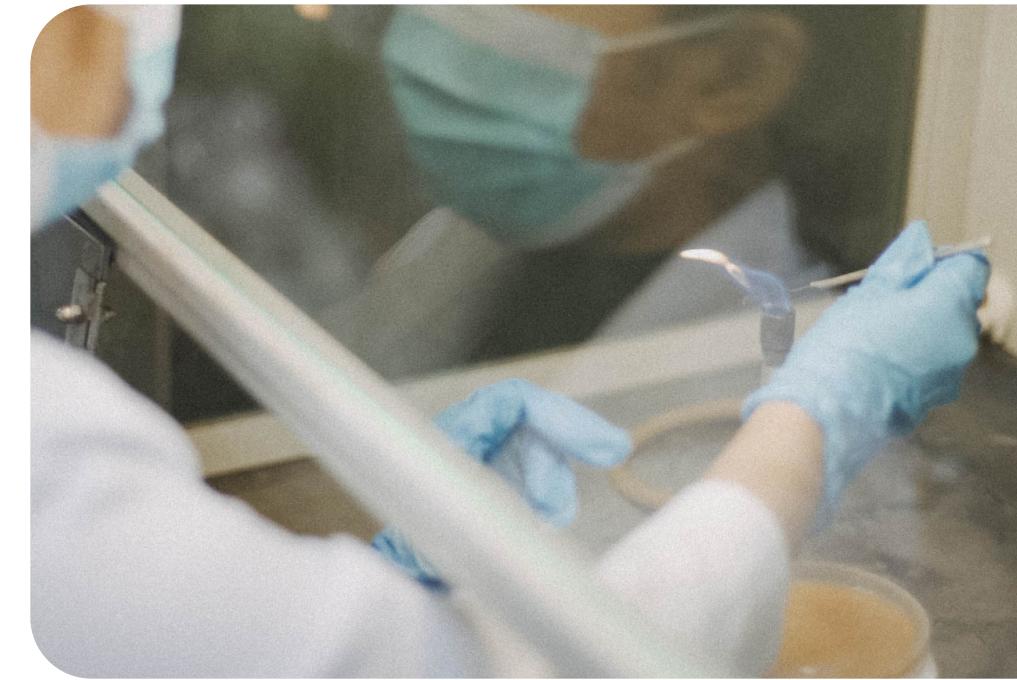


The Bioprocess and Bioresources Engineering Research Center (BioPRER) is specifically mandated to boost partnerships between BioPRER and the local bioprocess industries based on proper IP management and protection to provide a mutually-beneficial interaction through addressing industry problems and/or developing industrially-important sustainable bioprocess materials; intensify knowledge, provide

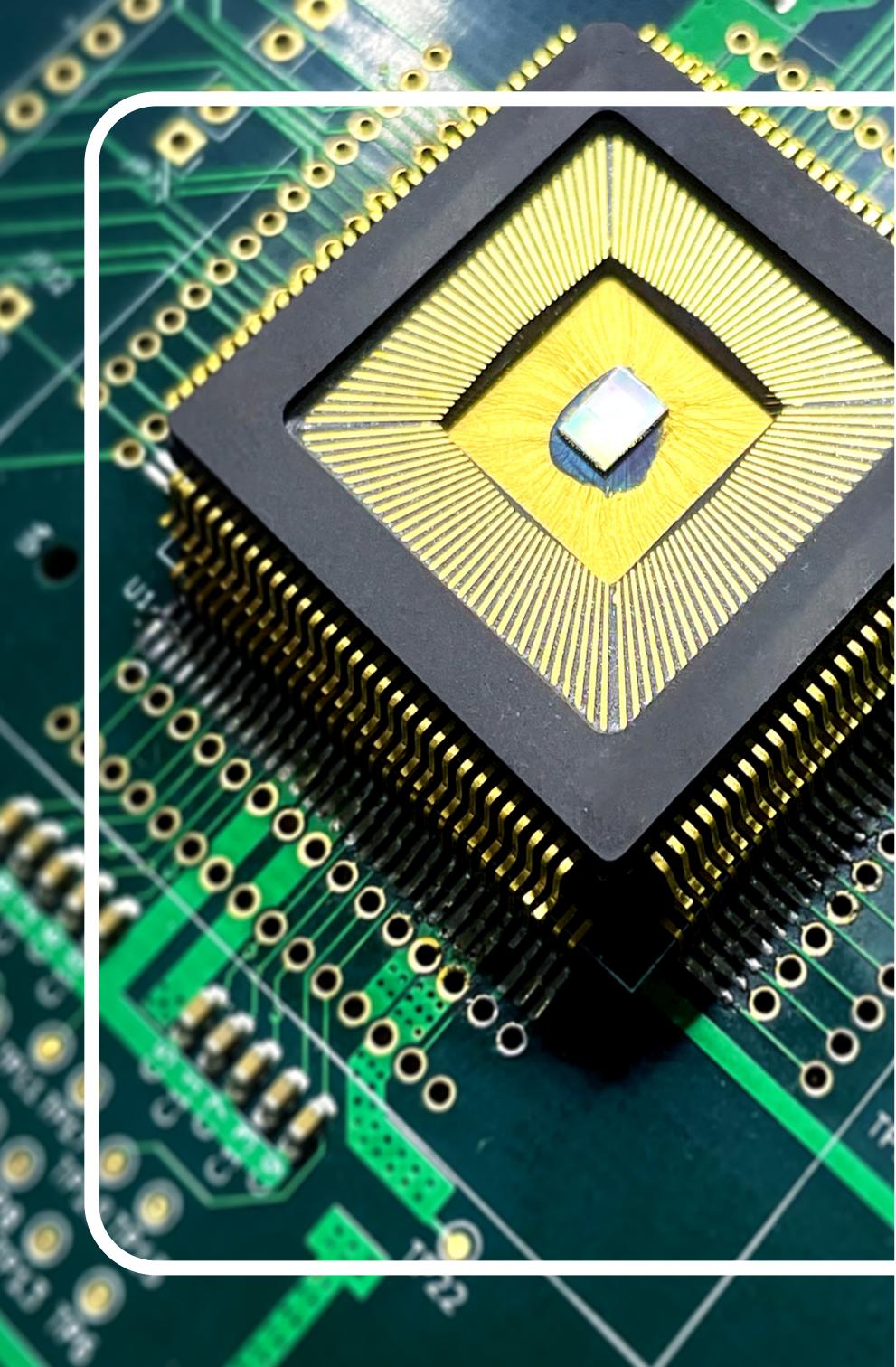
Bio RER

Bioprocess and Bioresources Engineering Research Center

technical support and mentoring, and assist academia-based researches for emerging and related technologies in bioprocess science and engineering; promote inclusive growth and attain global competitiveness that will benefit the research community and industry by increasing the number of developed and transferred bioprocess-based technologies; and advance sustainability in the utilization of bioresources through circular economy principles by the deployment of bioprocess technologies for commodities and services, and generate revenues through technology transfer, licensing, and commercialization.



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CICD

The Center for Integrated Circuits Design – Microelectronics Laboratory, a pioneering research hub dedicated to advancing integrated circuits design in the Southern Philippines.

At CICD, we are committed to pushing the boundaries of IC development. Since our inception, we have been at the forefront of fundamental research in microelectronics and IC design, from component- and block-level design to advanced system-level, system-on-chip (SoC) solutions, and IoT applications, such as Energy Harvesting and Wireless Sensor Networks.

Center for Integrated Circuits Design

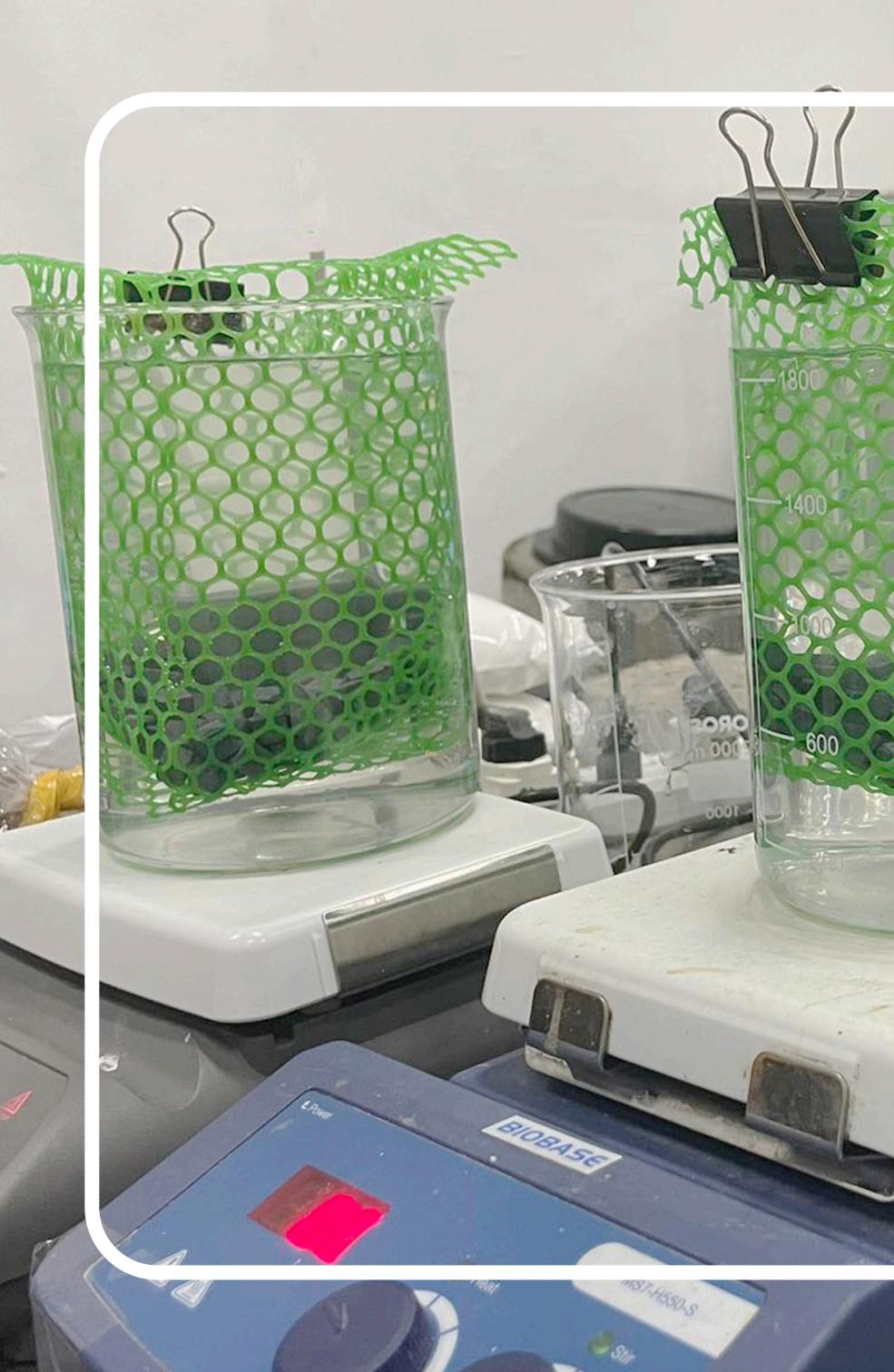
It is our mission to establish an IC Design niche in the country, continuously produce highly skilled graduates, proliferate microelectronic education, and eventually help position the Philippines globally in IC design.

Equipped with cutting-edge IC design tools, our laboratory provides a platform for both cell-based and full-custom IC design. These tools empower our engineers to tackle complex chip design and system development, meeting the demands of today's nanometer technology.

Through courses, training, workshops, university collaborations, industry partnerships and initiatives like research projects, we're shaping the future of IC design and Microelectronics in the country.



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CERT

The Center for Energy Research and Technology (CERT) serves as a hub for research and instruction, applying engineering principles to address challenges on waste management, renewable energy, emissions, green technology, and material recovery. It fosters collaboration between universities and industries to promote environmental sustainability and strengthen Mindanao's circular economy.

CERT is comprised of eight major research laboratories with each laboratory focusing on specific areas:

- Waste Valorization and Energy (WAVE): Conversion of biomass and solid wastes into valuable products;

Center for Energy Research and Technology

- Urban and Hazardous Waste Management (UHM): Management of urban and hazardous wastes through upcycling technologies;
- Green Research and Materials (GRaM): Development of green materials and composites from treated wastes;
- Waste and Resource Management (WaRM): Utilization of residuals for water and wastewater treatment;
- Solar Energy Systems (SES): Research on solar PVs and energy-efficient technologies;
- Energy-Environment Interaction (E2I): Study of energy-environment interaction and climate impact alleviation;
- Hydropower: Development of electrical microgrids and control systems; and
- Wind Energy: Research on fluid dynamics and turbine design for wind energy harvest.



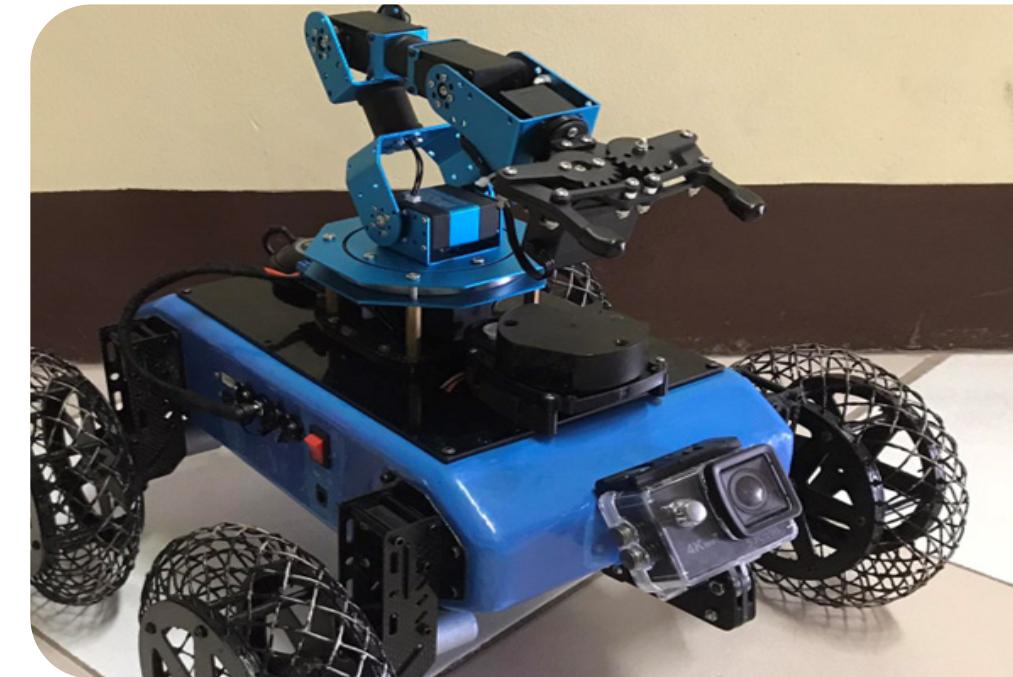
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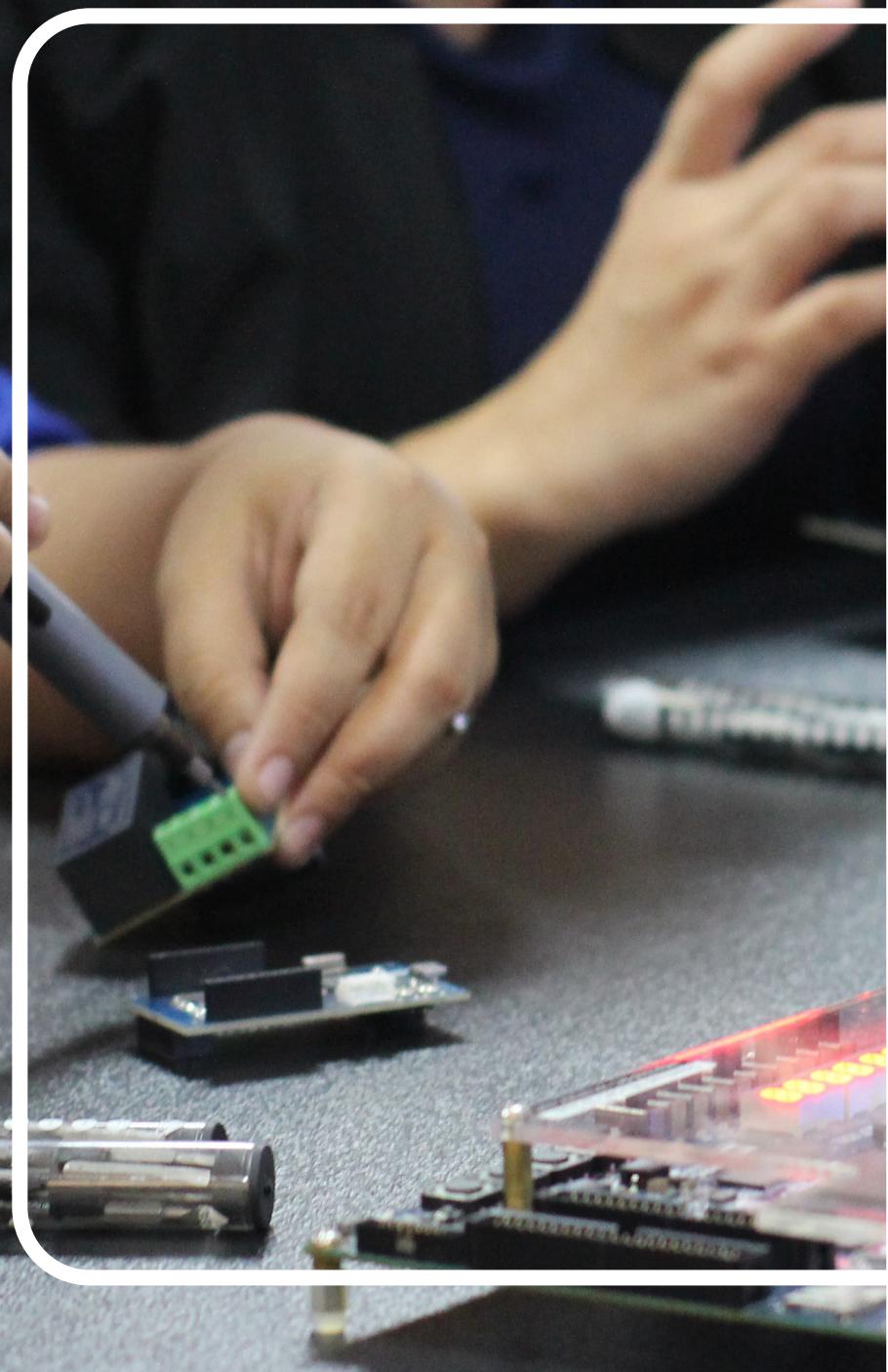
CMR

Center for Mechatronics and Robotics

The Center for Mechatronic and Robotics (CMR) consists of 3 laboratories: CRL (Control and Robotics Laboratory), Industrial Automation and Mechatronics Laboratory, and RICE Lab (Robotics, Instrumentation, and Control Engineering Laboratory). The center is a hub of knowledge and learning. The center aims to become a worldwide competitive research center for mechatronics and robotics, and it is open to other academic institution, industrial sector, local governments, non-governmental organizations (NGOs), and other related sectors.



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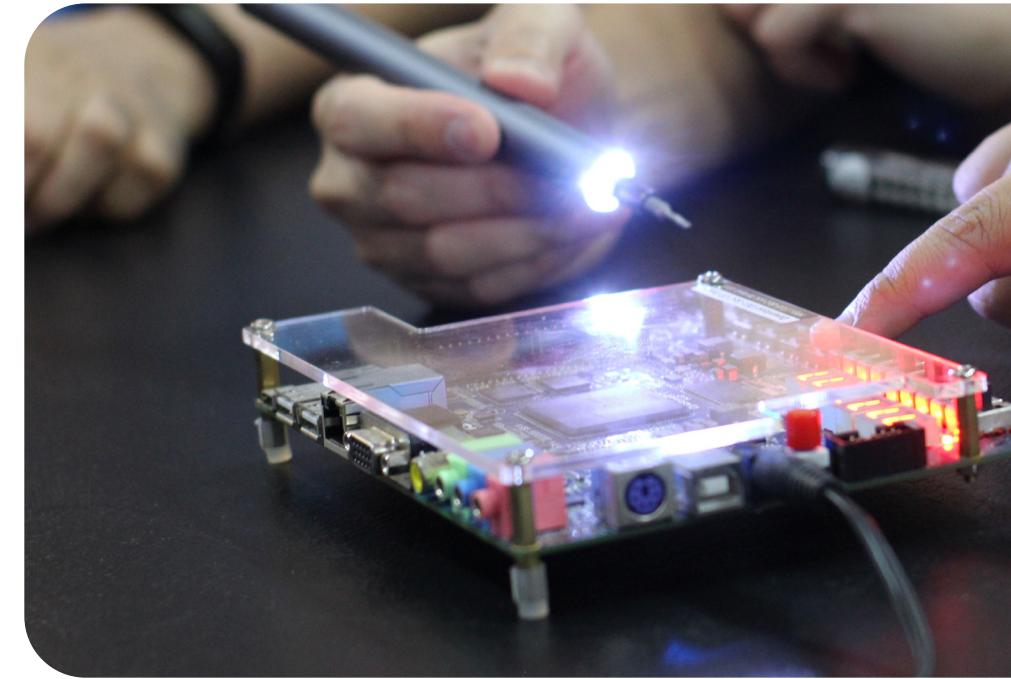


The Artificial intelligence (AI) is associated with human intelligence with similar characteristics such as language understanding, reasoning, learning, problem-solving, and others. AI is positioned at the core of the next generation software technologies in the market. Companies such as Google, IBM, Microsoft, and other leading players have actively implemented AI as a crucial part of their technologies. With this direction taking off on the international scene it is highly likely that the technologies that utilize AI will affect the economy, the academe, the industry, and ultimately our way of life. Positioning a Research Center in Mindanao that will be a catalyst for this global trend is vital if we want to grow with how the world is changing.

CAIR

Center for Artificial Intelligence Research

As a prime research facility in Artificial Intelligence in Mindanao, the main objective of the Center for Artificial Intelligence (CAIR) is to be an institution that will provide innovative solutions that will support an AI-based industry. Specifically, the CAIR's mandate is to encourage collaborative research efforts with other disciplines to benefit the community; foster knowledge sharing of AI literacy towards industry and the local community; consolidate AI resources, learnings, and talent in one place; forge strong collaborations between CAIR and the industry through proper Intellectual Property management and protection to provide a mutually beneficial relationship; provide research opportunities for ethics surrounding policy creation with the development of new AI technologies; and promote equal learning.



COET Building



The Center for Structural Engineering and Informatics (CSEI) cultivates a common thrust towards research and innovation in structural engineering and informatics at MSU-IIT, and in the Mindanao region in general. It envisions to be the prime research and development and service facility for sustainable structural engineering and informatics in Mindanao. CSEI's mission is to be the leading research and development facility and provider of technical and expert services in structural engineering and informatics to support the construction sector, other HEIs/SCUs, and the Mindanao community.

CSEI

Center for Structural Engineering and Informatics

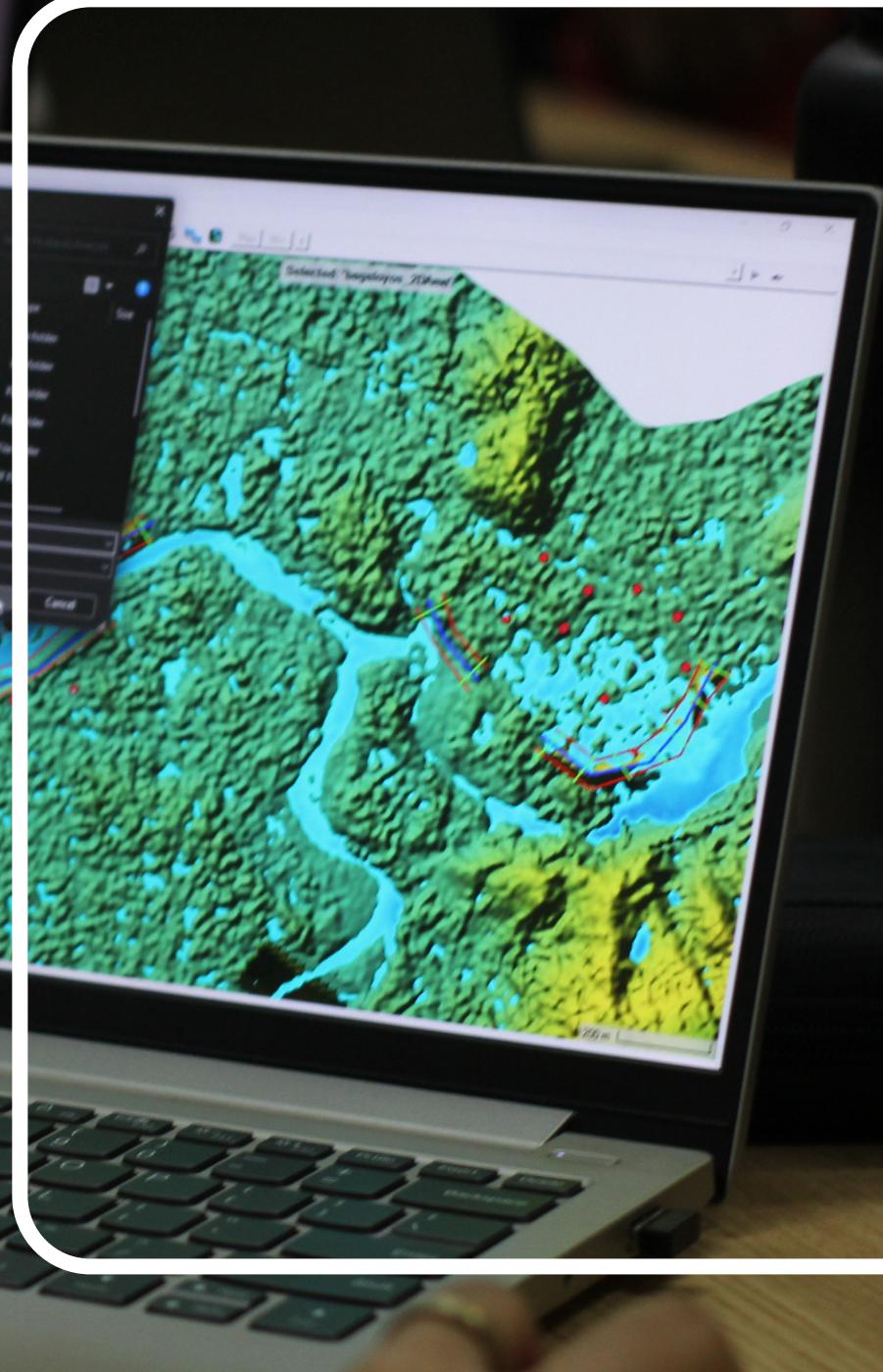
It is the CSEI's mandate to solve real-world problems and situations involving structural engineering and informatics through (1) generating new knowledge through research and development collaborations in the fields of structural engineering and informatics; (2) forging strong relationships with other academic institutions and the construction sector; and (3) disseminating knowledge and technology by providing expert assistance in structural engineering and informatics.



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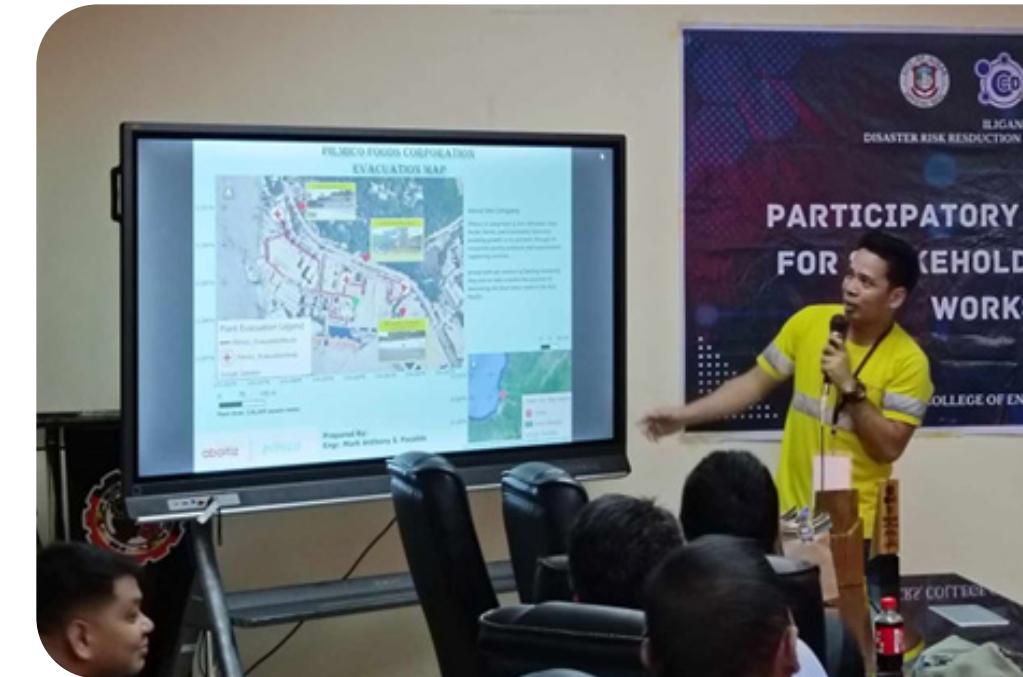
CRS GIS

This Center for Remote Sensing and Geographic Information Systems (CRS-GIS) is a leading hub for research, training, and technology transfer in Mindanao. It is the mandate of the CRS-GIS to contribute to science-based decision-making for understanding and solving real-world geographic problems and situations through (1) providing technical assistance in utilizing RS-GIS-based climate/disaster risk and vulnerability



Center for Remote Sensing and Geographic Information Systems

assessments, risk and thematic mapping, and the establishment of exposure databases; (2) engaging institutions and organizations in mutually beneficial collaborative endeavors to address geomatics problems; (3) enhancing and increasing knowledge, providing technical support and mentoring, conducting training, and assisting research related to emerging and related geomatics technologies; and (4) serving as a research facility for undergraduate and graduate students conducting geomatics studies.



Room 109, 1st floor
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BTRC

Bamboo Technology Research Center

This Bamboo Technology Research Center (BTRC) is dedicated to advancing the sustainable use of bamboo and fostering the growth of bamboo-based industries. It employs a comprehensive strategy encompassing research, extension, and production to facilitate the transfer of pertinent bamboo technology to industry, Higher Education, Institution/State Universities and Colleges, and the community.

Moreover, BTRC provides solutions through lab-and pilot-scale processing, physical characterizations, and expertise spanning material manipulation to processing. This focus is geared towards fostering innovations, product development, and prototyping, ensuring products are market-ready.



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RPTC

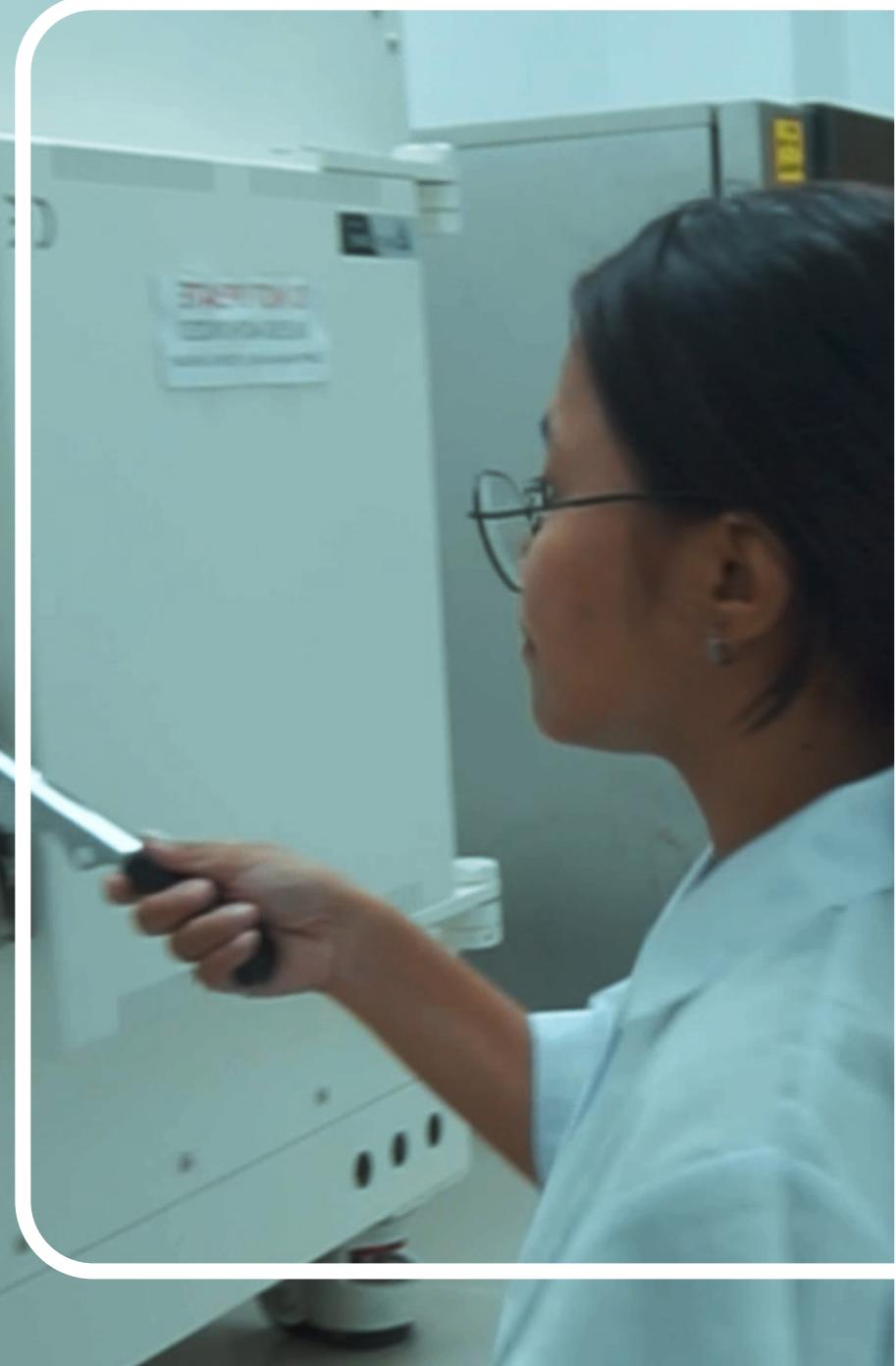
Resource Processing and Technology Center

The Resource Processing and Technology Center (RPTC) focuses on solving the scientific and technological problems and challenges facing the energy and resource sectors—mining, cement, extractive metallurgy and electric power stations—that are critical industries for the sustainable development of Mindanao and the national economy. The Center will also tackle the multidisciplinary social and environmental challenges associated with natural resource extraction, waste management, circular economy and sustainable development.

Under this center are four (4) major research laboratories, namely (i) Mining and Mineral Processing (MinProc) Laboratory, (ii) Metal Extraction (MetEx) Laboratory, (iii) Physical and Mechanical Metallurgy (PhysMM) Laboratory, and (iv) Recycling and Environment Laboratory (ReclEn), including the RPTC Characterization and Analytical Laboratory as a common laboratory of the Center.



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The Research Center for Advanced Ceramics (RCAC) serves as a cornerstone in propelling the ceramics field forward, nurturing talent, fostering innovation, and contributing to socio-economic and cultural progress. It provides extension and training services for ceramic cottage industries in Iligan City and neighboring provinces, acting as a vital resource hub. Extending its expertise beyond, it offers training programs to both internal and external stakeholders, aiding in research endeavors, conducting analytical testing, and providing consultation services. Collaborations and workshops further enrich the research landscape, while technical support and comprehensive training programs ensure smooth and efficient utilization of equipment.

RCAC

Research Center for Advanced Ceramics

The purpose of the RCAC includes developing materials for multidisciplinary research and education on ceramics and related materials, with emphasis on their synthesis, processing, manufacturing, and evaluation of properties and performance. Moreover, the RCAC will make advanced research in a large variety of materials of interest to various industries and government agencies. These local projects and collaborative efforts with other organizations and companies will lead to excellent academic and technological works in the field of ceramics, composites, and related materials.



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