## Theme 6-3: Sustainability of Environmental and Chemical Processes - 2023

| Title | Name of the PI | List the Names of the Co-Is | Department | Abstract | Starting Date | Ending Date | Funding | Amount of Funding |
|---|---|---|---|---|---|---|---|---|
| Control of Volatile Organic Compound (VOC) Emissions from Healthcare Facilities | Zarook Shareefdeen | None | CHBE | Biofilters are air-phase biological reactors used in the removal of industrial air pollutants, which include odorous compounds such as hydrogen sulphide, ammonia together with volatile organic compounds (VOCs) such as benzene, toluene,...etc. Some of the odorous compounds are toxic as well as nuisance even at very low concentration levels. US EPA lists more than hundred and eighty VOCs as hazardous air pollutants (HAPs) which can cause serious health issues... | 30/05/2019 | 20/05/2020 | FRG | 2500 |
| FRG20-S-E36 Biofiltration of Hazardous Air Pollutants (HAPs) | Zarook Shareefdeen | None | CHBE | Clean Air Acts (CAA) of United States listed more than 180 compounds as Hazardous Air Pollutants (HAPs) which are emitted from industry. Many of these compounds are highly carcinogenic and cause serious health and environmental effects; thus environmental authorities in most countries including United Arab Emirates (UAE) put strict regulations on the emission level of these compounds. Many of the HAPs can be removed by biological oxidation by readily available microorganisms. Of the available air pollution control technologies, biofilters are widely recognized as one of the sustainable bio-technology based processes due to its operation under ambient conditions and low cost of operation and maintenance. ... | 01/06/2020 | 31/05/2021 | FRG | 4000 |
| FRG20-S-E37, “Medical Waste Treatment, Transport and Regulations” | Zarook Shareefdeen | None | CHBE | Medical waste generated in hospitals and health care facilities expose danger to public as well as medical staff. Furthermore, one of the main problems facing today is the transport of medical wastes from wealthy country to developing or poor countries. Wealthy countries export non-degradable, low-value waste like plastic, clinical and other industrial wastes to different developing nations in large quantities for recycling... | 01/06/2020 | 31/01/2021 | FRG | 4000 |
| FRG21-S-E46, “Waste Management Methods During COVID-19 and Beyond | Zarook Shareefdeen | None | CHBE | In this proposed project, changes in waste management methods used during COVID-19 and beyond will be explored. Preparedness for emergencies is critical in many areas including waste collection from residential and commercial facilities, waste transport, waste treatment, resource management, training of employees as well as creating awareness about hazardous wastes among public..... | 01/06/2021 | 31/05/2022 | FRG | 5000 |
| FRG19-S-E102, “Control of Volatile Organic Compound (VOC) Emissions from Healthcare | Zarook Shareefdeen | None | CHBE | Cleaning, and disinfecting products used in the hospitals contain harmful chemicals such as ammonia and volatile organic compounds (VOCs) that can worsen the conditions of patients, visitors and staff working in healthcare facilities. Formaldehyde is recognized as one of the human carcinogens and this compound is widely used as a disinfectant and preservative of anatomical specimens in the hospital... | 01/06/2019 | 31/05/2020 | FRG | 2500 |
| Autonomous Solar-powered Marine Robot for Plastic Debris Collection | Mohamed Abdelgawad | N/A | MCE | The objective of the project is to develop a cost-effective autonomous robot capable of collecting trash from the surface of river. The robot is powered by solar power through the utilization of photovoltaic cells. It will be built to cruise at a speed of 1 m/s powered by two 200 watt 43x43 cm solar panels. Its volume's capacity is approximately 50 liters. The robot's time is going to be divided into working hours in the night and charging hours during sun times. Furthermore, it will be programmed to operate in a predefined route, | 26/11/2022 | 01/06/2023 | URG | 6000 |
| Understanding Potential Climate Change Impacts on the Stability of Coastal Lagoons | Serter Atabay | Dr. Geórgenes Hilário Cavalcante Segundo; Dr. Edmo Campos | CVE | This research proposed to investigate the effects of climate change on key environmental factors affecting the hydrodynamics (circulation and mixing) and water quality (eutrophication) at two small lagoon systems, the Umm Al Quwain Lagoon (UAQL) in the Arabian Gulf (UAE) and the Mundaú-Manguaba Estuarine-Lagoon System (MMELS) in South America (Brazil). The UAQL under sub-tropical arid climate affected by high evaporation, low precipitation rates and currently experiencing extreme sea surface temperatures not projected until the end of the century elsewhere in the tropics. On the other hand, the tropical MMELS (tropical semi-humid climate), exhibits strong seasonal cycle of high and low river flow/wave energy seasons (winter/summer). Due to their geomorphology, they respond rapidly to any natural or anthropogenic perturbation, making these systems “natural laboratories” that can be used to understand how coastal systems may respond to future climate conditions in other parts of the globe and thus a high priority area of research. To our knowledge, the combination of such contracting systems in the context of climate change impacts on systems dynamics has not been studied and the outcome of such study will be very useful to local authorities and government bodies to develop appropriate mitigating strategies to account for adverse impacts of climate change | 01/06/2022 | 31/05/2024 | FRG | 372,500 |
| Understanding Potential Brine Disposal Impacts of a Desalination Plant on Coastal Waters | Serter Atabay | Dr. Geórgenes Hilário Cavalcante Segundo; Dr. Edmo Campos | CVE | Numerical modeling and simulations have been widely used by researchers and engineers as an effective tool to help in optimizing designs based on the set environmental and economic criteria. By creating a hydrodynamic model for this coastal area, solution strategies could be developed to overcome the potential impact of brine disposal and facilitate an optimal operation of the desalination plant. A hydrodynamic model is an efficient, comprehensive approach to representing coastal water dynamics. This study will investigate the economic and environmental impacts of brine disposal in a desalination plant through a numerical 3-D hydrodynamic model using Delft3D FM. Once developed, the calibrated 3-D numerical model can help understand the circulation patterns and dispersions, which will help in identifying and mitigating the impacts of brine disposal on the desalination plant. Additionally, this study will bring economic benefits to the desalination plant by helping develop efficient strategies for better planning and management of the technological solutions related to the desalination plant. | 01/06/2023 | 05/05/2025 | FRG | 439200 |