Final Year Project Showcase Batch-2019
Year 2023

	Department: PHYSICS Programme: Applied Physics
1	**Project Idea** Multiple membrane based Ion exchange module utilization to recover caustic from industrial waste.
2	**Process** Electrodylasis by using Multiple Cat-Ion Exchange Membranes. Electrodialysis Water treatment process (ED – Process) use membranes that are semipermeable to transport ions based on their charge and use electrical current to lower the ionic content of water.
3	**Outcome** Caustic recovery from the industrial waste and saves Marine life. It can contribute to the conservation of marine species, protect fragile ecosystems, and promote sustainable practices. By raising awareness and implementing effective strategies, it can make difference in preserving the beauty and diversity of marine life.
4	**Evidence (Theoretical Basis)** Electrodialysis is a process in which electrically charged membranes are used to separate ion. A cation exchange membrane is a semipermeable membrane that will allow only Cat-Ions to pass through it. NaOH pass through membrane where only cat-ions passes through membrane.
5	**Competitive Advantage or Unique Selling Proposition** (
a	**Attainment of any SDG** (e.g. How it is achieved and why it is necessary for the region) Due to their high cost, these layers (IEM) have found little use in Pakistan. We have integrated these methods with objectives for **SDG#14: Life Below Water** **SDG#09: 'Industry, Innovation and Infrastructure'**. The goal of the Current project is to create a prototype for the use of waste recycling and treatment.
b	**Any Environmental Aspect** (e.g. carbon reduction, energy-efficient, etc.) This product will protect marine life by processing industrial waste containing acidic content.It helps to Clean water and Sanitation & also helps in Industry,Innovation and Infrastructure.
c	**Cost Reduction of Existing Product** Ion Exchange Membranes (IEMs) have received a lot of attention for their extensive uses in everything from waste treatment to pharmaceuticals in order to fulfill the energy goal and ease climate-related difficulties..
d	**Process Improvement which Leads to Superior Product or Cost Reduction, Efficiency Improvement of the Whole Process** (e.g. What is the issue is current process and what improvement you suggests) 29.16% efficiency was achieved with stack having multiple layer of cat-ion exchange membrane. This may be increased by using more membranes.

e	**Expanding of Market share** (e.g. how it expand and what is the problem with the current market) This product is quite expensive and not available in local markets. So this will provide industry an advantage of not only to treat the industrial waste but also obtaining caustic from the waste but in our process we use our own synthesized membrane.	
f	**Capture New Market** (e.g. Niche market or unaddressed segment) We need to introduce the product in the market for industries producing mercirizing waste.	
6	**Target Market** (Industries, Groups, Individuals, Families, Students, etc) Please provide some detail about the end-user of the product, process, or service Textile industries, Chemical industries and Pharmaceutical industries will be prime user of this product.	
7	**Team Members** (Names along with email address)	Muhammad Zuhad muhammad.zuhad28 @gmail.com Wajahat Ali irfan4203336 @cloud.neduet.edu.pk Masood Ali ali4200765 @cloud.neduet.edu.pk Fozia Gull gull4206800 @cloud.neduet.edu.pk
8	**Supervisor Name** (along with email address)	Mr. Junaid Kareem Khan & Dr. Shazia Parveen junaidkk@neduet.edu.pk
10	**Pictures (If any)**