A MECHZINE

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GEETHANJALI

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Editorial Message

Hailed as the first draft of creativity and innovation, a magazine presents a social and tasteful conversation of a powerful organization, where the refined imaginative sensibilities and abilities of its young personalities go to the front. It holds mirror to the bunch exercises and activities embraced by the foundation to etch the multifaceted characters of adolescents besides being a media platform. On this earth shattering event of drawing out the magazine, we, the publication group, appreciatively recognize the unmistakable assortment of commitments made by the students and the staff.

"All progress comes beyond comfort zone"

Editorial Board

VISION-MISSION

VISION

To evolve as a prospective learnig centre for producing quality human resourses.

MISSION

DM_1: Impart Technical knowledge through effective teaching-learning practices

DM_2: Provide congenial academic environment for honing technical skills

DM_3: Develop professional and entrepreneurial skills through collaborations

DM_4: Promote leadership skills along with social and ethical values

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

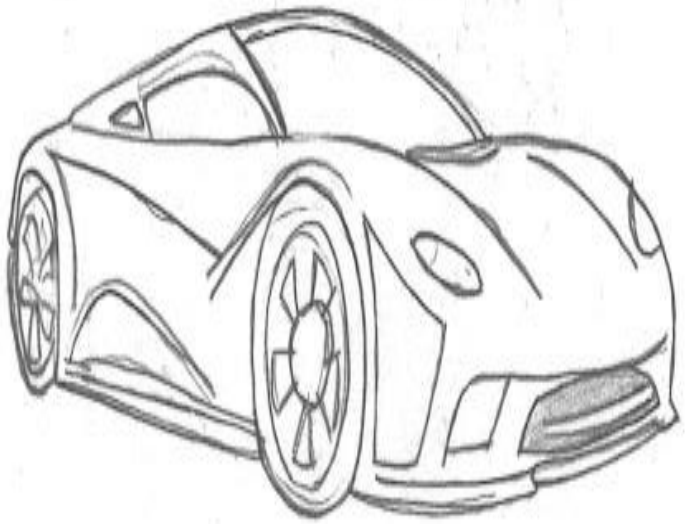
Graduates of B.Tech in Mechanical Engineering program shall able to

PEO1: Analyze Mechanical Engineering problems and provide sustainable solutions.

PEO2: Pursue successful professional career in industry, academia or research.

PEO3: Engage in continuous learning to keep abreast with emerging technologies with the sense of professional ethics.

PEO4: Contribute in multi-disciplinary teams through effective inter personal skills.



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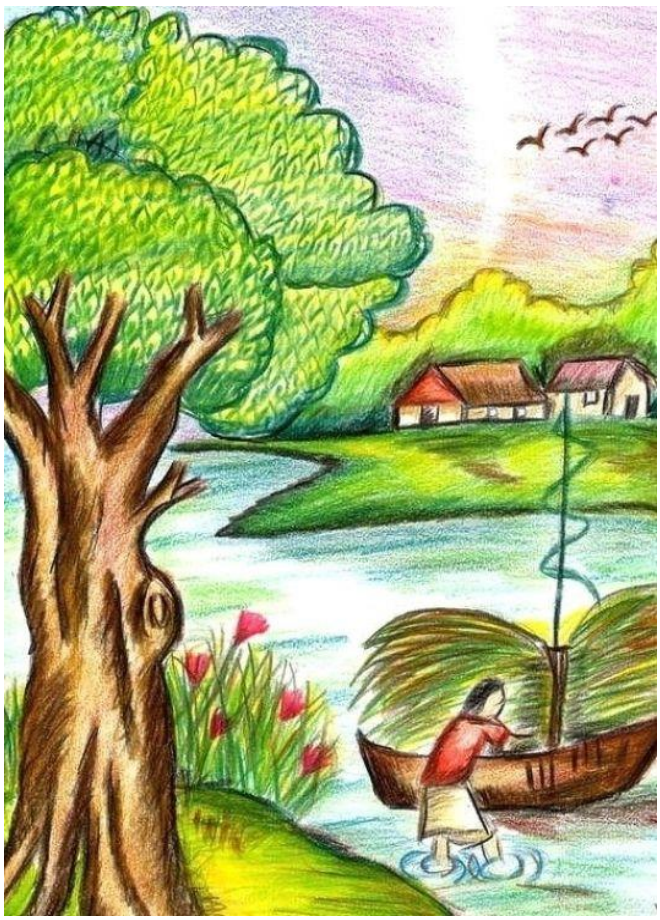
C.SUDARSHAN (182U1A0309) , II ME



G. KIRAN(192U1A0304) , I ME

D. YASWANTH SAI(182U1A0315), II ME

K. KRANTHI(182U5A0305) , III ME

P. LOKESH (182U1A0339) ,II ME

Poems

I'll Remember You Always

Rarely does someone
get to influence a person's life
in a positive way
for a lifetime,
as a teacher can,
fostering optimism and confidence,
providing knowledge that leads to success,
and being a good role model,
as you have,
and you are,
and you will...
forever.
I'll remember you always.
Thank you.

A. YUVAKUMAR(192U1A0301), I ME

Mother Earth's Gifts

Mother Earth gives her gifts for all to share,

She gives them freely, yet she's still aware

That things are changing, perhaps for the worse.

How much more can she give if our future is cursed?

It's way past time to put Mother Earth first,

To clean up the water before we all thirst,

To clean up the air before our lungs sicken,

To renew the soil and feel it quicken.

How long until the point of no return?

How much longer until we all finally learn,

That to this task we all must rise.

And stop abusing Mother Earth before she dies.

D. JAGADEESH(162U1A0309) , IV ME

Paradise or...?

Paradise or paradise lost?
Your effort is what it will cost
To keep our precious earth clean
By living a lifestyle that's green.

We cannot go on as we are
Leaving scar after scar
Upon this beautiful planet
Which so many take for granted.

The time to take action is now
To restore what's been damaged somehow.
We stand on the brink of "too late,"
But there's still time to change our fate.

SK. ARSHAD ALI (172U1A0334), III ME

Best Friend

I love you not only for what you are,
but for what I am when I am with you.
I love you not only for what you have made of yourself,
but for what you are making of me.

I love you because you have done more than any creed
could have done to make me good, and more than any
fate could have done to make me happy.
You have done it without a touch, without a word, without a sign.

You have done it by being yourself.
Perhaps that is what being a friend means, after all.

M. SUMEESH (162U1A0326) , IV ME

The Fox and the Stork

One day, a selfish fox invited a stork for dinner. Stork was very happy with the invitation – she reached the fox's home on time and knocked at the door with her long beak. The fox took her to the dinner table and served some soup in shallow bowls for both of them. As the bowl was too shallow for the stork, she couldn't have soup at all. But, the fox licked up his soup quickly.

The stork was angry and upset, but she didn't show her anger and behaved politely. To teach a lesson to the fox, she then invited him for dinner the next day. She too served soup, but this time the soup was served in two tall narrow vases. The stork devoured the soup from her vase, but the fox couldn't drink any of it because of his narrow neck. The fox realised his mistake and went home famished.

Moral of the Story

A selfish act backfires sooner or later!

R. BALAGANESH (182U5A0309) , III ME

The Golden Touch

182U5A0309He was very rich, and he loved gold and all things fancy. But he loved his daughter more than anything. One day, he chanced upon a fairy. The fairy's hair was caught in a few tree branches. He helped her out, but as his greediness took over, he realised that he had an opportunity to become richer by asking for a wish in return (by helping her out). The fairy granted him a wish. He said, "All that I touch should turn to gold." And his wish was granted by the grateful fairy.

The greedy man rushed home to tell his wife and daughter about his wish, all the while touching stones and pebbles and watching them convert into gold. Once he got home, his daughter rushed to greet him. As soon as he bent down to scoop her up in his arms, she turned into a gold statue. He was devastated and started crying and trying to bring his daughter back to life. He realised his folly and spent the rest of his days searching for the fairy to take away his wish.

Moral of the Story

Greed will always lead to downfall.

V. HARI (182U1A0357) , II ME

The Crystal Ball

Nasir, a small boy, found a crystal ball behind the banyan tree of his garden. The tree told him that it would grant him a wish. He was very happy and he thought hard, but unfortunately, he could not come up with anything he wanted. So, he kept the crystal ball in his bag and waited until he could decide on his wish.

Days went by without him making a wish but his best friend saw him looking at the crystal ball. He stole it from Nasir and showed it to everyone in the village. They all asked for palaces and riches and lots of gold, but could not make more than one wish. In the end, everyone was angry because no one could have everything they wanted. They became very unhappy and decided to ask Nasir for help. Nasir wished that everything would go back to how it was once – before the villagers had tried to satisfy their greed. The palaces and gold vanished and the villagers once again became happy and content.

Moral of the Story

Money and wealth do not always bring happiness.

Friends Forever

Once upon a time, there lived a mouse and a frog, who were the best of friends. Every morning, the frog would hop out of the pond to visit the mouse, who lived inside the hole of the tree. He would spend time with the mouse and go back home. One day, the frog realised that he was making too much of an effort to visit the mouse while the mouse never came to meet him at the pond. This made him angry, and he decided to make things right by forcefully taking him to his house.

When the mouse wasn't looking, the frog tied a string to the mouse's tail and tied the other end to his own leg, and hopped away. The mouse started getting dragged with him. Then, the frog jumped into the pond to swim. However, when he looked back, he saw that the mouse had started to drown and was struggling to breathe! The frog quickly untied the string from his tail and took him to the shore. Seeing the mouse with his eyes barely open made the frog very sad, and he immediately regretted pulling him into the pond.

Moral of the Story

Don't take revenge because it can be harmful to you.

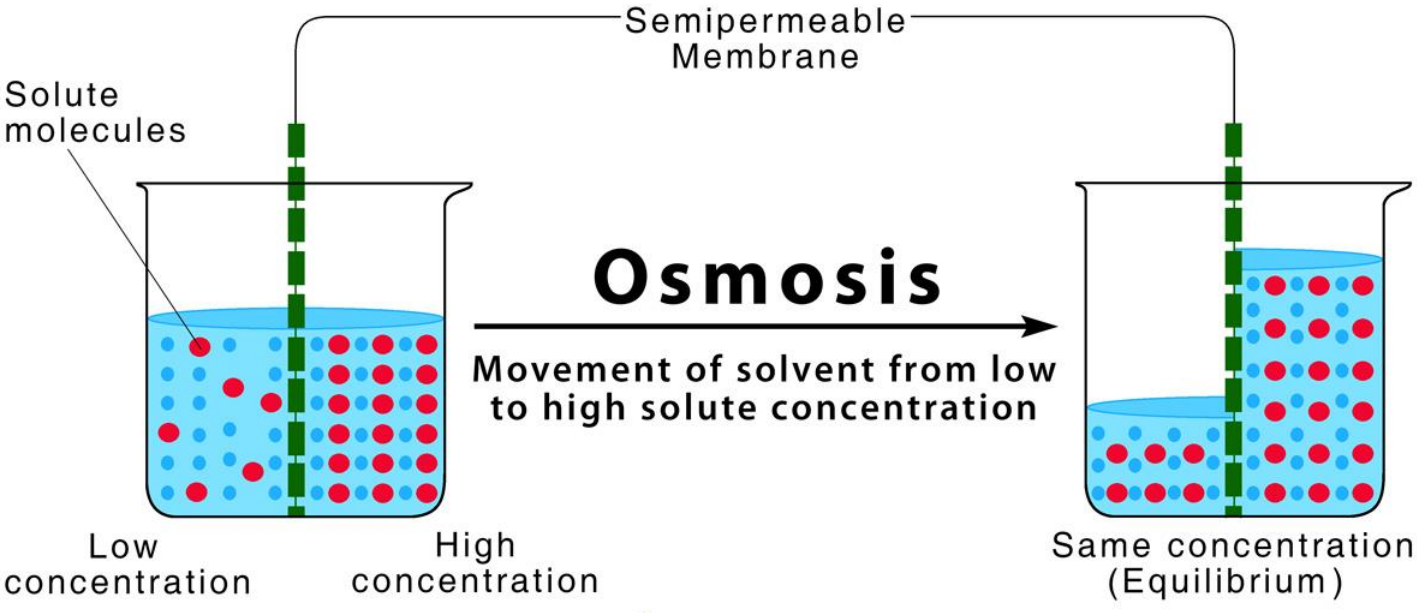
OSMOTIC POWER

Osmotic power, **salinity gradient power** or **blue energy** is the energy available from the difference in the salt concentration between seawater and river water. Two practical methods for this are reverse electrodialysis (RED) and pressure retarded osmosis (PRO). Both processes rely on osmosis with membranes. The key waste product is brackish water. This byproduct is the result of natural forces that are being harnessed: the flow of fresh water into seas that are made up of salt water.

Basics of Salinity gradient power

The method of generating power by pressure retarded osmosis was invented by Prof. Sidney Loeb in 1973 at the Ben-Gurion University of the Negev, Beersheba, Israel. The idea came to Prof. Loeb, in part, as he observed the Jordan River flowing into the Dead Sea. He wanted to harvest the energy of mixing of the two aqueous solutions (the Jordan River being one and the Dead Sea being the other) that was going to waste in this natural mixing process. In 1977 Prof. Loeb invented a method of producing power by a reverse electrodialysis heat engine.

The technologies have been confirmed in laboratory conditions. They are being developed into commercial use in the Netherlands (RED) and Norway (PRO). The cost of the membrane has been an obstacle. A new, lower cost membrane, based on an electrically modified polyethylene plastic, made it fit for potential commercial use. Other methods have been proposed and are currently under development. Among them, a method based on electric double-layer capacitor technology and a method based on vapor pressure difference.



Salinity gradient power is a specific renewable energy alternative that creates renewable and sustainable power by using naturally occurring processes. This practice does not contaminate or release carbon dioxide (CO_2) emissions (vapor pressure methods will release dissolved air containing CO_2 at low pressures—these non-condensable gases can be re-dissolved of course, but with an energy penalty). Also as stated by Jones and Finley within their article “Recent Development in Salinity Gradient Power”, there is basically no fuel cost.

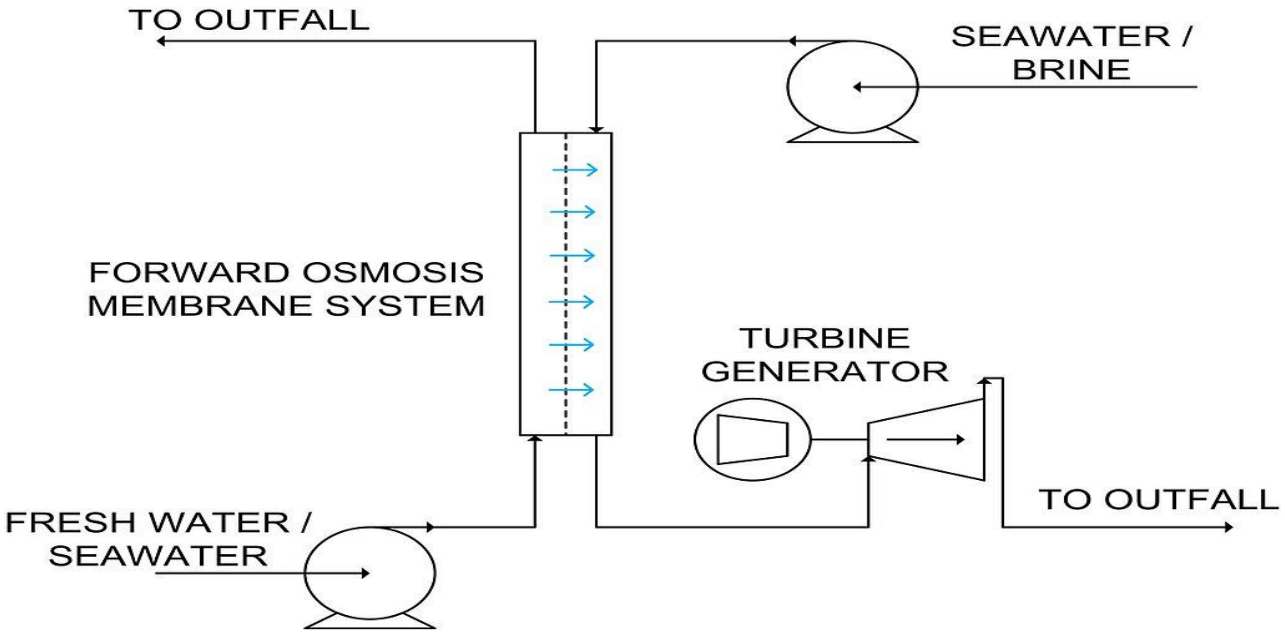
Salinity gradient energy is based on using the resources of “osmotic pressure difference between fresh water and sea water.” All energy that is proposed to use salinity gradient technology relies on the evaporation to separate water from salt. Osmotic pressure is the "chemical potential of concentrated and dilute solutions of salt". When looking at relations between high osmotic pressure and low, solutions with higher concentrations of salt have higher pressure.

Differing salinity gradient power generations exist but one of the most commonly discussed is pressure-retarded osmosis (PRO). Within PRO seawater is pumped into a pressure chamber where the pressure is lower than the difference between fresh and salt water pressure. Fresh water moves in a semipermeable membrane and increases its volume in the chamber. As the pressure in the chamber is compensated a turbine spins to generate electricity. In Braun's article he states that this process is easy to understand in a more broken down manner. Two solutions, A being salt water and B being fresh water are separated by a membrane. He states "only water molecules can pass the semipermeable membrane. As a result of the osmotic pressure difference between both solutions, the water from solution B thus will diffuse through the membrane in order to dilute solution A".[11] The pressure drives the turbines and power the generator that produces the electrical energy. Osmosis might be used directly to "pump" fresh water out of The Netherlands into the sea. This is currently done using electric pumps.

Capacitive method

A third method is Doriano Brogioli's capacitive method, which is relatively new and has so far only been tested on lab scale. With this method energy can be extracted out of the mixing of saline water and freshwater by cyclically charging up electrodes in contact with saline water, followed by a discharge in freshwater. Since the amount of electrical energy which is needed during the charging step is less than one gets out during the discharge step, each completed cycle effectively produces energy. An intuitive explanation of this effect is that the great number of ions in the saline water efficiently neutralizes the charge on each electrode by forming a thin layer of opposite charge very close to the electrode surface, known as an electric double layer. Therefore, the voltage over the electrodes remains low during the charge step and charging is relatively easy. In between the charge and discharge step, the electrodes are brought in contact with freshwater. After this, there are less ions available to neutralize the charge on each electrode such that the voltage over the electrodes increases.

The discharge step which follows is therefore able to deliver a relatively high amount of energy. A physical explanation is that on an electrically charged capacitor, there is a mutually attractive electric force between the electric charge on the electrode, and the ionic charge in the liquid. In order to pull ions away from the charged electrode, osmotic pressure must do work. This work done increases the electrical potential energy in the capacitor. An electronic explanation is that capacitance is a function of ion density. By introducing a salinity gradient and allowing some of the ions to diffuse out of the capacitor, this reduces the capacitance, and so the voltage must increase, since the voltage equals the ratio of charge to capacitance.



Reversed electrodialysis :

A second method being developed and studied is reversed electrodialysis or reverse dialysis, which is essentially the creation of a salt battery. This method was described by Weinstein and Leitz as “an array of alternating anion and cation exchange membranes can be used to generate electric power from the free energy of river and sea water.”

The technology related to this type of power is still in its infant stages, even though the principle was discovered in the 1950s. Standards and a complete understanding of all the ways salinity gradients can be utilized are important goals to strive for in order make this clean energy source more viable in the future.

P. THARUN KUMAR(172U1A0326), III ME

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

PO1. **Engineering Knowledge :** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7 **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8 **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

PO11 **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12 **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES

At the time of graduation student of B. Tech in Mechanical Engineering will be able to

PSO1: Professional Skills: Utilize the knowledge of materials and manufacturing principles to plan, design and monitor the production operations of an Industry.

PSO2: Design Skills: Employ the governing laws of thermodynamics, heat transfer and refrigeration & air-conditioning to design and develop thermo-fluid system.