BASIC SCIENCES & HUMANITIES NEWSLETTER

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- *STUDENTS SHY AWAY FROM MATHS, BUT IN REALITY MATHS IS THE BEST FRIEND OF MAN.* - SHAKUNTALA DEVI
- *EDUCATION IS WHAT REMAINS AFTER ONE HAS FORGOTTEN WHAT ONE HAS LEARNED IN SCHOOL. – ALBERT EINSTEIN*
- *"SCIENTIST BELIEVE IN THINGS, NOT IN PERSON"* - MARIE CURIE
- *YOU CANNOT PROTECT THE ENVIRONMENT UNLESS YOU EMPOWER PEOPLE, YOU INFORM THEM, AND YOU HELP THEM UNDERSTAND THAT THESE RESOURCES ARE THEIR OWN, THAT THEY MUST PROTECT THEM.* - WANGARI MAATHAI

Be Assertive

Morris the dog was walking past a property one day and he was suddenly confronted by a large black dog who barked ferociously through the fence at him."What are you doing?' asked Morris."I'm guarding this property." responded the black dog."What are you barking at me for? asked Morris. "Because you're a threat. Everyone has the potential to break in and steal from me, so I'm not taking any risks and am barking at everyone." Morris shrugged his shoulders and walked away, thinking about how much energy the black dog was unnecessarily wasting. The next day, he walked past the same property, but instead of being confronted by the vicious guard dog, he was met by a furry ball of fluff. "What happened to the large black dog?" he asked. "He annoyed his owners by barking all of the time, so they gave him away and replaced him with me." replied the ball of fluff. "You don't look very scary." observed Morris. "I'm not. You never have to worry about me being too angry." "What would you do if someone tried to steal from you?" asked Morris. "Why would anyone try to steal from me? I'm such a nice cute doggy that no-one would ever take advantage of me." Morris shrugged his shoulders and walked away, hoping that the little ball of fluff would be OK. The next day he walked past the same property and was met by a large golden retriever. "What happened to the little ball of fluff?" Morris asked. "Some intruders came last night and all he did was roll over to have his belly scratched while the place was ransacked." replied the retriever. "So, what's your strategy for guarding this place?" asked Morris. "I've learned that not everyone's a threat, so there's no point in barking at everyone and keeping them at a distance, but I've also learned that being nice and polite won't always cut it either as not everyone has my best interest at heart. Others will always know that

I'm here, but I feel comfortable enough with myself that I don't need to rant and rave to be heard or look after everyone else's needs to be liked. I'll just be calm and clear when communicating, decreasing the risk of being taken the wrong way." "I think I'll be seeing a lot more of you," said Morris, suitably impressed as he went on his way. Let me encourage you to learn from this story that you don't need to be an angry, rabid dog or a delightful ball of fluff to be successful in what you're doing.

Instead, learn to express yourself with clarity, honesty and calmness.

Brook Taylor

Taylor's theorem in many calculations, in applied and theoretical mathematics, it happens that a result cannot be exported directly

i.e. 3/40 = 0.75, but we must approach it in successive steps. Where do we meet such processes? In our daily practice, but we do not give attention. Suppose we want to share "fairly" one euro in three parts. Each share in decimal is 1/3 = 0,333333 ... = 3/10 +3/100 + 3/1000 + ... = 3 (1/10 +1/100 + ...) and the parenthesis is an endless sum.

We cannot find exactly each share. The process of adding an infinite sum of numbers is the heart of the mathematical concept of the numerical series. We say that the value of 1/3 at 0.001 is 0.333. So we can approach it as much as we want, and that for mathematics, this replaces precision.

In this simple example we go beyond the finite processes of elementary mathematics (algebra, and school geometry) and capture the infinite processes in the foundations of mathematics of continuous magnitudes. Later in the same way we will approach functions to calculate their values. The idea of Taylor1 was exactly this: as we approach 1/3 with decimal fractions, we will approach functions with polynomials.

Differences between the Two

Static and kinetic are two opposite ideas. Static refers to a system that is not changing with time, while kinetic refers to a system in motion.

Definition

Static friction is the frictional force that exists between two solid surfaces, that are non-moving. The lateral relative motion between these two surfaces, is stalled by the force of static friction. Due to it, there is no slipping and therefore, there is no motion. Kinetic friction occurs between two moving solid surfaces, in contact with each other. Even though objects are in motion, the force of friction cannot be eliminated completely and it continues to be a resistive force to motion.

Coefficient

The static and dynamic friction coefficients are two numbers that are calculated to get an estimate of dry friction, felt between two surfaces. Both ratios are calculated between the force of friction and the normal force felt between the two solid surfaces. The coefficient of static

friction (μ) is given by:

$F = \mu_{static} N$

The strength of friction between two static surfaces can be estimated by calculating the coefficient of static friction.

Coefficient of kinetic friction is given by the equation:

$F = \mu_{kinetic} N$

where $\mu_{kinetic}$ is the coefficient of kinetic friction. The coefficient for the static variety is generally higher than the kinetic friction coefficient for two solid surfaces, in contact with each other.

Understanding dry friction and measuring it is very important, if one wants to overcome or minimize its effects in technology, leading to an increase in overall efficiency of functioning.

Green chemistry

Green chemistry is the process of thinking and utilizing the existing knowledge to reduce the adverse impact of chemicals on the environment. The utilization of knowledge for reducing chemical hazardous with the development activities is the foundation of green chemistry.

In a chemical reaction, if the entire chemical reactants are converted into useful products then no chemical waste will be generated. Hence the environment will be free from any pollution. This can only be achieved if the conditions are optimized for the reaction. Green chemistry has many applications in our day to day life. The following points will show its uses:

1. **Dry cleaning of clothes** – In earlier days we used tetrachloroethylene as a solvent for dry cleaning. This compound is carcinogenic and also pollutes the ground water. Nowadays, liquefied carbon dioxide with suitable detergent is used for this purpose. It generated liquid carbon dioxide as a byproduct and hence causes less pollution.

2. **Bleaching of paper** – Initially chlorine gas was used for this purpose but now it has been replaced by hydrogen peroxide. Hydrogen peroxide along with a suitable catalyst which promotes its bleaching action is used.

The **twelve principles of green chemistry** are

1. **Prevention**. Preventing waste is better than treating or cleaning up waste after it is created.
2. **Atom economy.** Synthetic methods should try to maximize the incorporation of all materials used in the process into the final product.This means that less waste will be generated as a result.
3. **Less hazardous chemical syntheses**. Synthetic methods should avoid using or generating substances toxic to humans and/or the environment.
4. **Designing safer chemicals.** Chemical products should be designed to achieve their desired function while being as non-toxic as possible.
5. **Safer solvents and auxiliaries**. Auxiliary substances should be avoided wherever possible, and as non-hazardous as possible when they must be used.

6. **Design for energy efficiency**. Energy requirements should be minimized, and processes should be conducted at ambient temperature and pressure whenever possible.
7. **Use of renewable feedstocks**. Whenever it is practical to do so, renewable feedstocks or raw materials are preferable to non-renewable ones.
8. **Reduce derivatives**. Unnecessary generation of derivatives—such as the use of protecting groups—should be minimized or avoided if possible; such steps require additional reagents and may generate additional waste.
9. **Catalysis**. Catalytic reagents that can be used in small quantities to repeat a reaction are superior to stoichiometric reagents (ones that are consumed in a reaction).
10. **Design for degradation**. Chemical products should be designed so that they do not pollute the environment; when their function is complete, they should break down into non-harmful products.
11. **Real-time analysis for pollution prevention**. Analytical methodologies need to be further developed to permit real-time, in-process monitoring and control *before* hazardous substances form.
12. **Inherently safer chemistry for accident prevention**. Whenever possible, the substances in a process, and the forms of those substances, should be chosen to minimize risks such as explosions, fires, and accidental releases.

Plastic litter accumulation on high-water strandline of urban beaches in India

Today, almost every beach on every coastline is threatened by human activities. The inadequate recycling and poor management of waste in developing countries has resulted in considerable quantities of plastic contaminating beaches. Though India has long coastline of 5,420 km along the mainland with 43 % of sandy beaches, data on litter accumulation, particularly the plastics, which are one of the most common and persistent pollutants in marine environment, are scanty. The abundance and distribution of plastic litter was quantitatively assessed in four sandy beaches in Mumbai, India, bimonthly from May 2011 to March 2012. Triplicates of 2 × 2 m (4 m^2) quadrats were sampled in each beach with a total of 72 quadrats. Overall, average abundance of 11.6 items m^{-2} (0.25–282.5 items m^{-2}) and 3.24 g m^{-2} (0.27–15.53 g m^{-2}) plastic litter was recorded in Mumbai beaches. Plastic litter accumulation significantly varied temporally and spatially at $p = 0.05$. Significantly higher plastic litter accumulation was recorded in Juhu beach. Furthermore, the highest abundance by weight was recorded in November and May numerically. More than 80 % of plastic particles were within the size range of 5–100 mm both by number and weight. Moreover, coloured plastics were predominant with 67 % by number of items and 51 % by weight. Probably, the intense use of beaches for recreation, tourism, and religious activities has increased the potential for plastic contamination in urban beaches in Mumbai.

The department of English organized a national workshop on "**Retooling Language Teaching To The Students Of Professional Courses**" on 1st ,2nd and 3rd of Nov. 18 with presentations on

1. Attitude pertinent to teachers 0f professional courses
2. Pedagogy related to language teaching
3. Communication from corporate view
4. The art of presentation of content
5. Evaluation of syllabus

Dr G.Chenna Reddy,. Dr P.Yamini, Sk. Shabreen Sulthana prof. P Gopichand & P.Naga Suseela are the resource persons

An orientation program for the first B.Tech students was held for two days ie..,20th & 21st Nov,18 Prof Sarma of Ramakrishna math, Hyd gave a presentation on general English for daily routine , setting goals and efforts to achieve goals.

FACULTY PARTICIPATION

- The faculty members organized a Three Day National Workshop on "Retooling Language Teaching to the Students of Professional Courses" on 1st, 2nd and 3rd of Nov., 2018.
- Ms. G. Pavani presented a paper at an International Seminar on "Negotiating Socio-cultural Spaces: Rethinking Dynamics of Gender" held at Andhra University on 8th and 9th of Nov., 2018.
- Mr. M.V.Ramanjaneyulu and Mrs. K Bhagya Lakshmi published papers in IJE&T and IJPAM in Nov., 2018.