



Krantiveer Vasant Rao Narayanrao Naik Shikshan Prasarak Sanstha's  
**Loknete Gopinathji Munde**  
**Institute of Engineering Education & Research**  
Canada Corner, Sharanpur Road, Nashik-422002.  
(Degree & Diploma Engineering)



## NEWS LETTER 2022 - 2023

Edition : 2022-2023 (2)

Theme - Green Engineering



### Joint Secretary Message

I congratulate the editorial board of our engineering institute for bringing out the Second Quarterly Newsletter of the Academic Year 2022-23 on the subject "Green Engineering".

Green engineering approaches the design of products and processes by applying financially and technologically feasible principles to achieve one or more of the following goals: (a) decrease in the amount of pollution that is generated by a construction or operation of a facility, (b) minimization of human population exposure to potential hazards (including reducing toxicity), (c) improved uses of matter and energy throughout the life cycle of the product and processes, and (d) maintaining economic efficiency and viability. Green engineering can be treated as an overarching framework for all design disciplines. One of which is Green building (also known as green construction or sustainable building) refers to both a structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from planning to design, construction, operation, maintenance, renovation and demolition.

- Adv. Tanaji Jaybhawe

Joint Secretary (KVN Naik Shikshan Prasarak Sanstha, Nashik)



### Vice President's Message

It gives me immense pleasure to write a few words on the occasion of publication of our Engineering Institute's Second Quarterly Newsletter on the subject "Green Engineering". Many engineering disciplines engage in green engineering. This includes sustainable design, life cycle analysis (LCA), pollution prevention, design for the environment (DFE), design for disassembly (DFD), and design for recycling (DFR). As such, green engineering is a subset of sustainable engineering. Green engineering involves four basic approaches to improve processes and products to make them more efficient from an environmental point of view:

1. Waste reduction;
2. Materials management;
3. Pollution prevention; and,
4. Product enhancement.

Green engineering approaches design from a systematic perspective which integrates numerous professional disciplines. In addition to all engineering disciplines, green engineering includes land use planning, architecture, landscape architecture, and other design fields, as well as the social sciences.

- Adv. P. R. Gite

Vice President (KVN Naik Shikshan Prasarak Sanstha, Nashik)



It gives me immense pleasure to write a few words as pre face to our Institute's Second Newsletter on "Green Engineering". "Green engineering is the design, commercialization, and use of processes and products in a way that reduces pollution, promotes sustainability, and minimizes risk to human health and the environment without sacrificing economic viability and efficiency." Green engineering utilizes engineering processes and methods that minimize pollution, improve a business' sustainability and decrease the potential for health issues caused by unsafe manufacturing and design methods. Engineers may achieve this goal without affecting a company's economic success or efficiency by using and improving existing processes.

We see examples of green engineering around us every day. Whether it's a Nissan LEAF electric car, a new downtown office tower built to Leadership in Energy and Environmental Design (LEED) standard, or biodegradable cups from the local coffee shop, green engineering has embedded itself into the fabric of our daily lives. So what does green engineering look like, exactly, when it's applied to stuff in the real world? Chances are you're surrounded by green-engineered technologies, since sustainability has become such an important consideration in our lives. Here we'll take a quick look at the major areas you'll most likely encounter green technologies. Henceforth, the above mentioned Newsletter will be published quarterly on different subjects.

- Prof. V.J. Bodake (Diploma Co-coordinator)



### Editor

At first, I am grateful for the opportunity to continue working in a role where I can collaborate with departments to continue to meet our academic plan and the college's vision and mission. Here's a second edition of 2022-23 on Green engineering.

- Prof. Swati D. Nagare, Civil Dept. LoGMIEER, Nashik



## Civil Engineering

### ❖ Industrial Visit ❖

Industrial visit has been arranged for the students with policy to visit at least two industries in every semester for each class to enhance the practical knowledge of the Students. TY Civil Students went on an Industrial Visit at Water Treatment plant, Vilholi, Nashik on 23<sup>rd</sup> November 2022. The motive of visit is to learn and develop practical knowledge on Water Purification process.



Visit at Maharashtra Engineering Research Institute (MERI). It is the prime institute of Maharashtra state under Water Resources Department. It is entrusted with the work of applied research in various disciplines of civil engineering like soil mechanics, construction material studies, testing, highway, coastal, remote sensing & GIS, seismology, hydraulic model studies, reservoir sedimentation studies etc.



### ❖ Social Activity ❖



A visit to an Orphanage was organized by Civil Engineering Students Association (CESA) to help the children of orphanage by donating some of their daily needs like, Toothpaste, Hair oil, Baby food, baby diapers etc.

### ❖ Staff Training ❖

**Training :** 5 days FDP Effective teaching & Learning through self developments at G.G.S.P. Nashik  
**Staff:** 1) Prof. P. A. Gore 2) Prof. N. H. Pawar



## Computer Engineering

### ❖ WELCOME FUNCTION 2022 ❖

The Welcome Function was held on the 12<sup>th</sup> October 2022 at the college. On this day felicitation of newly admitted students done. The purpose of this function is **to welcome new students in a friendly atmosphere and to encourage their creative impulses to boost their confidence.** It is the day where seniors and juniors finally bond and unite to celebrate being part of the college. "Fresher's Party" in any college is an event which every student eagerly awaits from their time of admission. The fresher's day was filled with excitement, joy, music, enthusiasm, laughter and happiness.



### ❖ Expert Lecture On "Digital Marketing" ❖

Expert Lecture on "Digital Marketing" on 6th October 2022 at 12.30 PM to 2.30 PM. at seminar hall. The guest speaker Mr. Shoeb Inamdar, Spoke on importance of Digital marketing for the students. Digital marketing is important because it connects brands with consumers when they're most receptive. Digital marketing strategies increase awareness, leads, and revenue in a scalable yet cost-effective way. digital marketing has three main components: Lead Generation, Lead Capturing, and Lead Nurturing.



### ❖ Industrial Visit At Technokraft ❖



### ❖ Expert Lecture On "Project technology" ❖



Industrial visit arranged to the students to enhance the practical knowledge of the Students.

## Electrical Engineering

### ❖ Industrial Visits ❖

On 28<sup>th</sup> November 2022 SY and TY students of Electrical Department visited following stalls in “SHELTER 2022”

#### CCTV & SECURITY SYSTEM



During visit to this stall student seen and understand working of various security system like fire alarm system, video doorbell and advanced security locks. As well as they have seen various type CCTV camera and their working.

#### SOLAR SYSTEM



Solar system is renewable energy source. During visit to this stall student understand the working principle of solar panels, inverters, various type of batteries. Now a day's Solar industry is one of the grooming technology and student may have Entrepreneurship Opportunity in the field.



#### ELEVATOR

At this stall students have seen the new technology in Elevator. They have seen the hydraulic and pneumatic Lift working.



As per curriculum laid by MSBTE, Mumbai. Industrial visits are mandatory to intensify the practical knowledge of the students. SY and TY students visited to “SETU ELECTRICALS” Dhakambe, to understand working principle and applications of transformer along with internal and external structure of transformer.

## Mechanical Engineering

### ❖ Industrial Visit ❖

Industrial visit organized at S.T.WORKSHOP  
NASHIK Mechanical Engg. Dwarka,Nashik  
Organized Industrial visit at Bio



Medical Waste Management Plant



### ❖ Students Participation ❖

TY MECH STUDENTS Presented Project “ CNC Router “ at  
Pravara Rural Polytechnic,Loni .Bagged Second Prize & Trophy.



### ❖ Staff Training ❖

**Training :** 5 days FDP Effective teaching & Learning through self developments at G.GS.P. Nashik  
Staff: 1) Prof.N.R.Bodke 2) Prof.N.G.Dafade 3) Prof. G.A.Wadnere



## Green Engineering

Green engineering is environmentally conscious attitudes, values, and principles, combined with science, technology, and engineering practice, all directed toward improving local and global environmental quality " to implement green engineering we have to use some principals as

- Holistically use systems analysis and integrate environmental impact assessment tools.
- Conserve and improve natural ecosystems while protecting human health and well-being.
- Use life-cycle thinking in all engineering activities.
- Ensure that all material and energy inputs and outputs are as inherently safe and benign as possible.
- Minimize depletion of natural resources.
- Strive to prevent waste.

We see examples of green engineering around us every day. Whether it's a Nissan LEAF electric car, a new downtown office tower built to Leadership in Energy and Environmental Design (LEED) standard, or biodegradable cups from the local coffee shop, green engineering has embedded itself into the fabric of our daily lives.

So what does green engineering look like, exactly, when it's applied to stuff in the real world? Chances are you're surrounded by green-engineered technologies, since sustainability has become such an important consideration in our lives. Here we'll take a quick look at the major areas you'll most likely encounter green technologies.



**Prof M. D. Sanap**  
Asst Professor  
AIML department

Green engineering is the design, commercialization, and use of processes and products in a way that reduces pollution, promotes sustainability, and minimizes risk to human health and the environment without sacrificing economic viability and efficiency.

Green engineering embraces the concept that makes decisions to protect human health and the environment can have the greatest impact and cost-effectiveness when applied early, in the design and development phase of a process or product.

- Principles of Green Engineering

The principles of green engineering are as mentioned below:

1. Holistically use systems analysis and integrate environmental impact assessment tools.
2. Conserve and improve natural ecosystems while protecting human health and well-being.
3. Use life-cycle thinking in all engineering activities.
4. Ensure that all material and energy inputs and outputs are as inherently safe and benign as possible.
5. Minimize depletion of natural resources.
6. Strive to prevent waste.

Green engineering develops and applies engineering solutions while being cognizant of local geography, aspirations, and cultures. The concept also

Creates engineering solutions beyond current or dominant technologies; improves, innovates, and invents (technologies) to achieve sustainability. The objective is to actively engage communities and stakeholders in the development of engineering solutions.

EPA is working (Environment Protection Agency) to promote green engineering

EPA's Green Engineering Program encourages public and private sectors to incorporate risk-based approaches and methods into the design of chemical processes and products by Developing tools, Educational materials for academia.

EPA's Green engineering training modules for academic curricula or industry training , methodologies, and case studies are available.

EPA has created training materials to illustrate green engineering alternatives for chemical process designs.

EPA uses various methods, such as printed materials, conferences, and webinars, to promote green engineering approaches among academia and industry engineers. The goal is to facilitate a flow of information and ideas for new and existing green engineering courses, case studies, and process design methodologies.

- Prof. Sushama Punde  
LoGMIEER, Nashik

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## INTRODUCTION :

In today's society engineers are being driven to create processes and products that are sustainable, environmentally friendly and financially viable. Sustainability as defined by the World Commission on Environment and Development is forms of progress that meet the needs of the present without compromising the ability of future generations to meet their needs. Historically sustainability and sustainable design tends to have been incorporated into a portion of the project typically the outcomes such as justifying environment effects associated with resource like water takes by ensuring no take reduces water flows below the 85% fish protection level or in treated effluent discharges ensuring all potential downstream effects are considered for example of soil and groundwater analysis and dispersion modeling etc.

## COST:

This incorporation is typically more sporadic than comprehensive. Additionally there is the perception that sustainability costs more than the historical ways of doing things. Traditionally products and processes often do not reflect their "full" cost, that is, the cost of the environmental and social impacts from this product or process. An example of this is in terms of pollution cost, are products that are made with polluting materials generally do not include the extra cost of cleanup or disposal. This cost is paid by tax-payers and the environment therefore allowing the product to be sold at a cost lower than the full product lifecycle cost. Where the sustainable product or process does in fact provide a cost saving, particularly over the entire lifecycle of the product or process in terms of both operating and capital costs these tend to have been implemented into the water and wastewater industries as technologies advance and upgrades to the plants occur.

**Sustainability** of the Product/project outcomes is now considered a minimum requirement and more focus is being applied to how the outcome is achieved in the design and construction of the plant. Green engineering is the term that has been coined to encompass the sustainability component into good engineering design. The 12 principles of green engineering have been developed by Anastas, P.T and Zimmerman, J.B to provide a framework for engineers to implement when designing new materials, products, processes and systems. These principles have been developed with broad statements so they can be applied over a wide variety of engineering and science fields, the purpose of this paper is to illustrate how they can be applied to the water and wastewater industry. The 12 principles of green engineering have been developed by Anastas, P.T and Zimmerman, J.B to enable engineers to incorporate elements of sustainability throughout all areas of a project in a systematic and comprehensive approach.

**12 Principles of Green Engineering ▲**

1. Inherent rather than circumstantial
2. Prevention rather than treatment
3. Design for separation
4. Maximize mass, energy, space, and time efficiency
5. Output-pulled versus input-pushed
6. Conserve complexity
7. Durability rather than immortality
8. Meet need, minimize excess
9. Minimize material diversity
10. Integrate local material and energy flows
11. Design for commercial afterlife
12. Renewable rather than depleting

**Ideologies** of Green Engineering are Conserving and improve natural ecosystems while protecting human health and well-being. Use life-cycle thinking in all engineering activities. Ensure that all material and energy inputs and outputs are as inherently safe and benign as possible. Minimize depletion of natural resources. Green engineering can also be defined as, it is the design, commercialization, and use of processes and products that minimize pollution, promote sustainability, and protect human health without sacrificing economic viability and efficiency. The factors affecting green engineering are: The most common factors are waste, energy consumption, and water utilization. There are three very imperative R's of green technology: Recycling means the use of waste itself as resources. Waste minimization can be achieved in an efficient way by focusing primarily on the first of the 3Rs, "reduce," followed by "reuse" and then "recycle." The term "Zero Waste" is no longer a stranger to all of us. Over the years, leading a zero waste life has been advocated by numerous environmentally conscious individuals worldwide. But how exactly do you achieve it? Here are some facts about the zero waste hierarchy and tips on how each level is practice. The zero-waste hierarchy is defined as the "progression of policies and strategies to support the Zero Waste system, from highest and best to lowest use of materials". The 5 levels are: Reduce (Most preferred) Reuse Recycle Recover Landfill (Least preferred) Reduce: The amount of waste produced Reducing our waste might be one of the most difficult steps in the hierarchy. As such, one can take small steps to practice this in our daily lives. To reduce your waste, a key question to ask yourself before purchasing an item would be "Is this a need or a want?" Most of the time, the item that we wish to purchase is more likely to be a want than a need. Other questions that one can take into consideration could be: How long do you foresee yourself using the item? Will it truly add value in your life? Are there any other alternative eco products? Just by avoiding the act of impulse buying, you can help to prevent the wastage of resources. At the same time, save your money! Reuse: Materials as much as possible The important notion of "waste nothing, use everything" can aid in the habit of reusing. Most of us disregard the power and ease of reusing as we fail to see that almost everything and anything can be reused! For example, you can use the pasta sauce that comes in a glass bottle to store your snacks (after cleaning it properly first). Next time, before throwing something away, take a moment to reconsider if the item can be reused for any other purposes! Recycle: Everything you can Recycling is definitely not a stranger to anyone. There are recycling bins almost in every city and country. So, nothing should be stopping you from recycling! Recover: Energy from waste For some of us, recovery of energy from waste is a novel concept as it is not a widespread practice. In some countries, they have facilities that convert their waste to energy which contributes significantly to the concept of recovery. For example, Norwegians residents are sorting their waste into various categories (organic, plastic and others). From there, the organic waste is then transformed into biogas which can be used as bio fuel for buses. Although recovery might be difficult without the help of the government or large corporations, we can contribute individually by repairing our items instead of throwing them out! Landfill The last level – landfill, is probably the option in the hierarchy that is viewed as the last choice. Unless you really cannot practice the 4 levels of the hierarchy aforementioned, then it will end up in the landfill.

**Green Engineering Ethics ▲**

1. Engineer processes and products holistically, use systems analysis, and integrate environmental impact assessment tools
2. Conserve and improve natural ecosystems while protecting human health and well-being
3. Use life-cycle thinking in all engineering activities
4. Ensure that all material and energy inputs and outputs are as inherently safe and benign as possible
5. Minimize depletion of natural resources
6. Strive to prevent waste
7. Develop and apply engineering solutions, while being cognizant of local geography, aspirations and cultures
8. Create engineering solutions beyond current or dominant technologies; improve, innovate and invent (technologies) to achieve sustainability
9. Actively engage communities and stake-holders in development of engineering solutions

**CONCLUSIONS**

Green engineering promotes innovative thinking towards sustainability which may not be achieved by applying the newest technology or process. The green engineer must redefine the project to evaluate the full lifecycle of the inputs and outputs to achieve sustainability throughout the Project/Products. The twelve principles provide a framework to guide engineers into considering suitability though all stages of design. They encourage the redefinition of the task to consider the full lifecycle, inputs and outputs. A number of these principles are already implemented in the water treatment and wastewater treatment industries. The twelve principles aim to allow systematic incorporation of green engineering throughout the entire project to the benefit of the environment and society.

- Prof. M. V. Raut  
(Dean-SA),  
LoGMIEER, Nashik-2