ARYA INSTITUTE OF ENGINEERING & TECHNOLOGY

GREEN AUDIT REPORT

2021 - 2022

PREPARED BY

EHS ALLIANCE SERVICES

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CERTIFICATE

EHS alliance

CERTIFICATE

PRESENTED TO

ARYA INSTITUTE OF ENGINEERING & TECHNOLOGY

SP-40 , Kukas, RIICO Industrial Area, Delhi Road, Jaipur -302028 , Rajasthan

Has been assessed by EHS Alliance Services for the comprehensive study of environmental impacts on institutional working framework to fulfill the requirement of

ENVIRONMENT AUDIT

ACADEMIC YEAR 2021-22

The environment legal compliances and initiatives carried out by the institution have been verified on the report submitted and were found to be satisfactory.

The efforts taken by management and faculty towards environment and sustainability are highly appreciated and noteworthy.

EHS ALLIANCE SERVICES GURGAON

SIGNATURE

05.07.2022
DATE OF AUDIT

EHS ALLIANCE SERVICES, PLOT A-72, SURYA VIHAR, GURUGRAM, 122001
WWW.EHSALL.IN | BUSINESS@EHSALL.IN | EHSALLIANCE@GMAIL.COM

ACKNOWLEDGEMENT

EHS Alliance Services would like to thank the management of Arya Institute of Engineering & Technology for assigning this important work of Green Audit. We appreciate the co-operation to the teams for completion of assessment.

We would also like to thank ***Dr. Pramod K. Sharma- Audit Coordinator***, for his continuous support and guidance, without which the completion of the project would not have been possible. We are also thankful to other staff members who were actively involved while collecting the data and conducting field measurements.

We are also thankful to

Er. Kshitiz Agarwal- *IQAC Director*

Er. Sandeep Jhamb - *H.O.D. Mechanical Engineering*

Mr. Rajesh Jaiswal - *Estate Manager*

Mr. Devendra Kumar Badiwal - *Accountant*

Last but not the least, we would like to thank ***Dr. Himanshu Arora- Principal and Dr. Arvind Agarwal, President of Society*** for giving us an opportunity to evaluate the environmental performance of the campus.

DISCLAIMER

EHS Alliance Services Audit Team has prepared this report for Arya Institute of Engineering & Technology based on input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived following best estimates and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

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Signature

LEAD AUDITOR

CONCEPT AND CONTEXT

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory from the academic year 2019–20 onwards that all Higher Educational Institutions should submit an annual Green, Environment and Energy Audit Report. Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

In view of the NAAC circular regarding Green auditing, the College management decided to conduct an external environment assessment study by a competent external professional auditor. The green audit aims to examine environmental practices within and outside the college campus, which impact directly or indirectly on the atmosphere. Green audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of college environment. It was initiated with the intention of reviewing the efforts within the institutions whose exercises can cause risk to the health of inhabitants and the environment.

Through the green audit, a direction as how to improve the structure of environment and inclusion of several factors that can protect the environment can be commenced. This audit focuses on the Green Campus, Waste Management, Water Management, Air Pollution, Energy Management & Carbon Footprint etc. being implemented by the institution. The concepts, structure, objectives, methodology, tools of analysis, objectives of the audit as below:

INTRODUCTION

Now a days, the educational institutions are becoming more thoughtful towards the environmental aspects and as a result new and innovative concepts are being introduced to make them sustainable and eco-friendly. To preserve the environment within the institution, a number of viewpoints are applied by the several educational institutes to solve their environmental problems such as promotion of the saving the energy, waste recycle, water consumption reduction, water harvesting and many more...

The activities carried out by the institution can also create adverse environmental impacts. Green audit is defined as an official inspection of the effects a college has on the environment. Green Audit is conducted to evaluate the actual scenario at the institution campus. Green audit can be a useful tool for a university /college to determine how and where they are using the most of the energy or water or resources; the institution can then decide how to implement changes and make savings. It can also be used to determine the nature and volume of waste, which can be used for a recycling project or to improve waste minimization plan.

Green auditing and the application of mitigation measures is a win-win situation for all the institutions, the learners and the mother earth. It can also result in health awareness and can promote the environmental awareness, values and beliefs. It provides a better understanding to staff and students about the Green impact on institution. Green auditing also upholds financial savings through reduction of resource usage. It gives an opportunity to the students and teachers for the development of ownership of the personal and social responsibility. The audit process involves primary data collection, site walk through with the team of university /college including the assessment of policies, activities, documents and records.

OVERVIEW OF THE COLLEGE

Arya Institute of Engineering & Technology (AIET) is amongst the foremost of Top Institutes in Rajasthan for Engineering in Higher Technical Education & Research. Established in the year 2005, in the State of Rajasthan, Arya Institute of Engineering & Technology has evolved into the most prominent College in the state as well as the Best Engineering Colleges in Jaipur. Spread over 5 acres of land, its highly skilled faculties are imparting education and guidance to thousands of students in a multi-faceted environment comprising of various Teaching Departments on its Campus. Since its establishment, the Institute has played a vital role in providing the best technical manpower and know-how to the country.

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MISSION, VISION & VALUES

MISSION

- ✓ To create a Progressive Academic Environment by nurturing the Creativity, Ideas, Innovation and Skills in Students in order to achieve Qualitative Techno-Managerial Skills.
- ✓ To provide Excellent Ambience to enhance the Teaching-Learning processes amongst Students and Faculty members by building a determined team who are committed to the ideas of Integrity, Positive Thinking and Social Development to meet industry expectations and requirements.
- ✓ To make Students Globally Competitive by providing suitable Training, Value Added Certification Courses and Beyond Syllabus Academics in order to generate capacity to face competitions and placements and become imaginative mastermind and inventive issue solver while providing them safe and challenging environment.

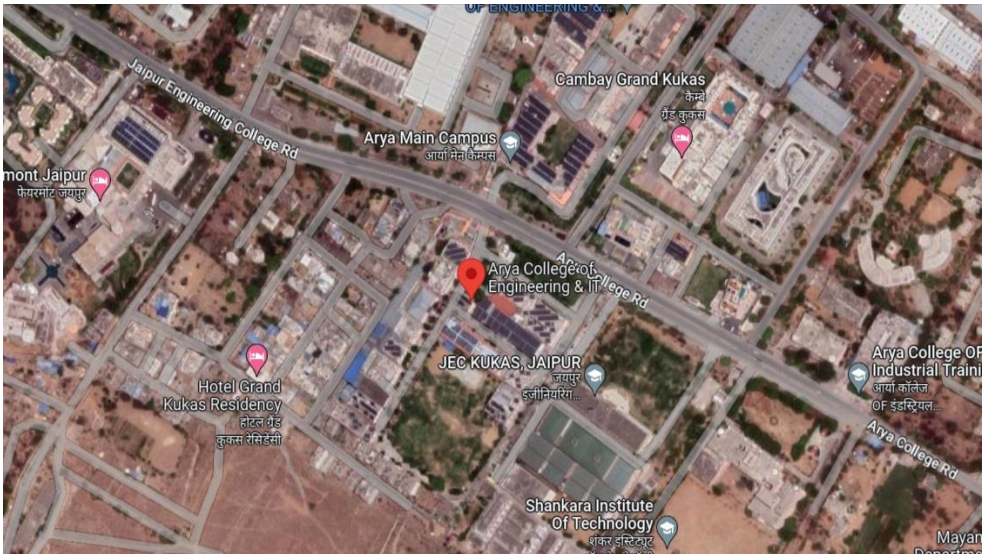
VISION

To emerge as the best educational institute and Work for Excellence in imparting quality education to the students to nurture their inherent talent as Innovative Professional in technical and managerial field there by making them competitive to meet all the future challenge of global economy..

VALUES

Create an environment that instills professionalism, integrity, and the highest professional commitment to the students

Geo Location
Geo Coordinates from Google maps:
27.0299119, 75.8913942



AUDIT PARTICIPANTS

On behalf of Arya Institute of Engineering & Technology

Name	Designation
Dr. Arvind Agarwal	*President of Society*
Dr. Himanshu Arora	*Principal*
Dr. Pramod K. Sharma	*Audit Coordinator*
Er. Kshitiz Agarwal	*IQAC Director*
Er. Sandeep Jhamb	*H.O.D. Mechanical Engineering*
Mr. Rajesh Jaiswal	*Estate Manager*
Mr. Devendra Kumar Badiwal	*Accountant*

On behalf of EHS Alliance Services

Name	Position	Qualifications
Dr. Uday Pratap	Lead Auditor	*Ph.D. , PDIS, QCI – WASH, Lead Auditor ISO 14001:2015*
Ms. Pooja Kaushik	Co-Auditor	*M.Sc., Field Expert, QCI – WASH*

EXECUTIVE SUMMARY

Green auditing is an essential step to identify and determine whether the institutional practices are sustainable and ecological. Traditionally, we were upright and efficient users of natural resources. But over the period of time, excessive usage of resources like water, electricity, petrol, etc. have become habitual for everyone especially, in urban and semi-urban areas. It is actually the right time to check if we (our process) are consuming more than required resources? Whether we are using resources sensibly?

Green audit standardizes all such practices and provides an efficient way to use natural resources. In the time of climate change and resource exhaustion it is necessary to re-check the processes and convert then in to green and sustainable. Green audit provides an approach for the same. It also increases overall awareness among the folks working in institution towards the eco-friendly environment.

This is the first attempt to conduct green audit of this campus for fulfilment of NAAC criteria. This audit was mainly focused on greening indicators like consumption of energy in terms of electricity and fossil fuel, quality of soil, water usage, vegetation, waste management practices and carbon

foot print of the campus. Initially a questionnaire was shared to know about the existing resources of the campus and resource consumption pattern of the students and staff in the campus.

GREEN AUDIT - ANALYSIS

1.1 GENERAL INFORMATION

1. Does any Green Audit conducted earlier?

No, this is the first external audit organized by the College

2. What is the total strength (people count) of the Institute?

Students
Male: 460 Female: 78 Total: 538

Teachers (including guest faculty)
Male: 31 Female: 14 Total: 45

Non-Teaching Staff
Male: 23 Female: 4 Total: 37

Total Strength
Male: 514 Female: 96 Total: 610

3. What is the total number of working days of your campus in a year?

There are two hundred and seven working days in a year.

4. Where is the campus located?

The campus is located at Sp- 40 , Arya Institute of Engineering & Technology,Jaipur Rajasthan (India)

5. Which of the following are available in your institute?

Garden area	*Available*
Playground	*Available*
Kitchen	*Available*
Toilets	*Available*
Garbage Or Waste Store Yard	*Available*
Laboratory	*Available*
Canteen	*Available*
Hostel Facility	*Available*

Guest House	*Available*

6. Which of the following are found near your institute?

Municipal dump yard	*Not in vicinity of institute*
Garbage heap	*No Garbage heaps*
Public convenience	*Public convenience is available*
Sewer line	*Approximately 1.0 KM sewer line within campus*
Stagnant water	*No stagnant water*
Open drainage	*No*
Industry – (Mention the type)	*No*
Bus / Railway Station	*Sindhi Camp Bus Stop, Jaipur Junction Station*
Market / Shopping complex	*Available*

1.2 WASTE MINIMIZATION AND RECYCLING

1. Does your institute generate any waste? If so, what are they?

Yes, Solid waste, Canteen waste, paper, plastic, horticulture, laboratories waste, e-waste, etc.

2. What is the approximate amount of waste generated per day? (in Kg approx.)

Biodegradable waste - 15 Kg
Non-biodegradable waste -5 Kg
Hazardous Waste - 2 Kg
Others < 1 Kg

3. How is the waste managed in the institute? By Composting, Recycling, Reusing, Others (specify)

Arya Institute of Engineering & Technology is using bio gas plant for solid waste management, water harvesting pits are there for water conservation, STP (100 KLD) is fully operational for waste water treatment. Lab waste is managed through muffle furnace.

4. Do you use recycled paper in institute?

No

5. How would you spread the message of recycling to others in the community?

College is spreading the awareness about recycling through different activities and campaigns to students, staff and local nearby villages

6. Can you achieve zero garbage in your institute? If yes, how?

Not yet achieved.

1.3 GREENING THE CAMPUS

1. Is there a garden in your institute?

Yes, about 37674 sq. ft areas are developed as Gardens.

2. Do students spend time in the garden?

Yes, students spend around 2-4 Hours during winters.

3. Total number of Plants in Campus?

Plant type with approx. count	
Full grown Trees	*80*
Small Trees	*250*
Hedge Plants	*1487*
Grass Cover sqm	*37674 sq. ft*

4. Is the College campus having any Horticulture Department? (If yes, give details)

Yes, 1 staff (maali) deployed in horticulture department

5. How many Tree Plantation Drives organized by campus per annum?

Plantation Drive is carried out annually.
Survival rate is more than 75%.

6. Is there any Plant Distribution Program for Students and Community?

No

8. Is there any Plant Ownership Program?

No

1.4 WATER AND WASTEWATER MANAGEMENT

1. List uses of water in your institute

Basic use of water in campus:

Drinking – 59.39 KL/month

Gardening – 52.92 Kl/month

Kitchen and Toilets – 343.18 KL/month

Others – 135.43 KL/month

Hostel – 982.80 KL/Month

Total = 1573.72 KL/Month

2. How does your institute store water? Are there any water saving techniques followed in your institute?

College stores water in underground and overhead tanks.

Saving Techniques

- *Avoid overflow of water-controlled valves are provided in water supply system.*
- *Close supervision for water supply system.*

3. Locate the point of entry of water and point of exit of waste water in your institute.

Entry *- Water comes from Municipal corporation and borewell*
Exit*- From Canteen, Toilets, Hostel, bathrooms and Labs through covered drainage which is connected to sewage treatment Plant (100 KLD)*

4. Write down ways that could reduce the amount of water used in your institute

Basic ways:

- *Close the taps after usage*
- *Water Conservation awareness for new students*
- *Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage*

1.5 ANIMAL WELFARE

1. List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)

5 dogs, 10 Cats, 20+ butterfly species, 100+ Squirrels and 30+ Birds are found in campus. A variety of bird's species and other flora and fauna are available, so institute is doing their bit for bio diversity conservation.

2. Does your institute have a Biodiversity Program or a KARUNA CLUB?

*Yes, Arya Institute of Engineering & Technology's **Eco club** actively organizes awareness through various campaigns and activities including seminars, poster competition, etc.*

1.6 CARBON FOOTPRINT - EMISSION & ABSORPTION

1. Electricity used per year - CO2 emission from Electricity

(electricity used per year in kWh/1000) x 0.84
= 274628/1000x0.84
= 230.69 tons

2. LPG/PNG used per year - CO2 emission from LPG/PNG

(LPG/PNG used per year in KG) x 2.99
=20254 x 2.99
=60.56 tons

3. Diesel used per year CO2 emission from HDS (Diesel)

(Diesel used per year in litres) x 2.68
= 38233 x 2.68
=102.46 tons

4. Transportation per year (car) CO2 emission from transportation (Bus and Car)

There are 17 college owned vehicles, 7 bus and 7 car, and 3 others
*=(7*2*2*180/100)*0.01 + (10*4*2*180/100)*0.02*
=0.25 + 1.44
=1.69 tons

Total CO2 emission per year cumulative by electricity usage + bus and car is 395.40 tons

After considering carbon absorption capacity of campus and solar energy export, the total carbon emission is 309.36 tons

CARBON ABSORPTION BY FLORA IN THE INSTITUTION

There are 80 full grown trees and 250 semi grown trees of different species, on the campus spread over 37674 sq ft.

Carbon absorption capacity of one full grown tree 22 kg Co2 Therefore Carbon absorption capacity of 80 full-grown trees 80 x 22 kg Co2 = 1.76 tons of Co2.

The carbon absorption capacity of 250 semi-grown trees is 50% of that of full-grown trees. Hence the carbon absorption 250 x 6.8 kg of Co2 = 1.70 tons of Co2

There are approximately Hedge Plants 1487 of various species being raised in the gardens and grown in the areas where no buildings are built Carbon absorption of bush plants varies widely with their species. Certain bushes absorb very high level of Co2 where as some others absorb very low level of Co2. In the absence of a detailed scientific study, 200g of Co2, absorption is taken per bush (in consultation with Environmental Science specialists). Based on this, total carbon absorption of bushes is 1487 x 200 g = 0.30 ton of Co2

The lawns on the campus have buffalo grass, Mexican grass and indigenous grass species and cover a total area of 37673 sq. ft. Carbon absorption capacity of a 10 sq. ft. area of lawn is 1 g per day Therefore, carbon absorption by lawn area 37674 x 365 x 0.1 g Co2 = 1.38 tons Co2 per year.

Grand total of carbon absorption capacity of the campus is 5.13 tons.

GREEN INITIATIVES

- The institution has functional compost machines and bio gas plant for organic solid waste management.

- There is ban on single use plastic and plastic crockery in the campus.
- College has a separate storeroom for the safe storage of electronic waste. After a certain interval of time college disposes of the E-waste to concerned agencies through the auction process.
- The college has a rainwater harvesting system for better groundwater recharge.
- The college has installed approximately solar panels (450 KW) and solar lights are also used for street lights.
- Personal Vehicles (Students) are not allowed in the campus

RECOMMENDATIONS

- Green building guidelines for future expansion projects of the campus.
- Environmental parameters shall be included in purchase policy to achieve a cradle to grave approach for sustainability.
- College should start the use of Sprinklers gardening purpose
- Increase plantation drives in nearby villages, local bodies, NGO and Municipal Corporation in order to balance the carbon emission and absorption.
- Arrange training programmes on environmental management system and nature conservation for schools and local people.
- *C*ollege should initiate a practice where all guests should be given a planter as a gift rather than a bouquet of flowers. Also, plantation should be carried out in nearby villages.
- Involve lower hierarchy staff in environmental awareness programmes and campaigns.
- Increase in Environmental promotional activities for spreading awareness at the campus.
- To eliminate the spillage and over usage of water in washbasins, urinals and toilet push taps are highly recommended.
- Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other materials for needy students. This can be an initiative under the green program.

- Regular workshops related to Plastic free campus, plantation drives, 3R implementation, e-waste collection, menstrual hygiene, etc. should be carried out

- Messages should be displayed at various locations to Aware the People about Energy Savings

CONCLUSION

This audit involves considerable team discussions and meetings with key staff members on a variety of environmental-related topics. The eco club of Arya Institute of Engineering & Technology promotes conservation of resources.

Overall 50% of Arya Institute of Engineering & Technology is for landscaping. The college makes a significant effort to act in an environmentally responsible manner and takes into account the environmental effects of the majority of its activities. The recommendations in this report suggests some more ways in which the college can work to improve its practices and develop into a more sustainable institution.

It's important to begin a few things, such as initiating sprinklers for irrigation and conservation awareness message display at different locations in campus. Additionally, we strongly advise to increase awareness amongst the students, staff and local societies for 3R principle and conservation of water and energy.

REFERENCE

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended 2010)
- The Petroleum Act: 1934 – The Petroleum Rules: 2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle
- Rules:1989 (Amended in 2005)
- Energy Conservation Act 2010.

- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules – 1975
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules – 1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules – 1981
- E-waste management rules 2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended 2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended 2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended 2010)
- The Batteries (Management and Handling) rules, 2001 (Amended 2010)
- Relevant Indian Standard Code practices.

ANNEXURE –ENVIRONMENT CONSCIOUSNESS PHOTOS

Well ventilated building structure

Well maintained college campus

Lush green campus

Sports Ground

Library

smart Classes

Well equiped labs

Auditorium

Cafeteria

Hostel

Water storage tanks and filtration unit

STP

Bird feeder

Plantation drive

Mini garden

Recycle in action

Solar PV

Push Taps for water conservation

********** END OF THE REPORT **********