



P.P.N.(P.G.)College,Kanpur

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7.1.3: Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following: 1. Green audit / Environment audit 2. Energy audit 3. Clean and green campus initiatives 4. Beyond the campus environmental promotion and sustainability activities

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PRINCIPAL
PT. ORITHI NATH (P.G.) COLLEGE
KANPUR



GREEN AUDIT

SOCIETY FOR ACADEMIC FACILITATION AND EXTENSION (REGD.)

A Study Valid till : ISO 50001: 2018 & ISO 14001:2015

53 Karmchari Nagar, Bareilly, (UP)

Disclaimer:

The Audit Team has meticulously compiled and prepared this report for Pandit Prithi Nath College, situated at Mall Road, Parade Crossing, Colonel Ganj, Kanpur, Uttar Pradesh. The report is based on the thorough analysis of input data submitted by the College, conducted by the team to the utmost of their capabilities. The particulars have been consolidated and meticulously examined in adherence to the various guidelines for Green Buildings stipulated in National and International Standards. The report has been generated through a comparative analysis of the existing facilities and the prerequisites outlined by diverse standards. The inputs derived from this process result from a comprehensive inspection and research initiative, aimed at fostering the development of a Healthy and Sustainable Institution.

The recommended measures can be implemented either in phases or as a whole, contingent upon decisions made by the Hon'ble Management and College. It is expressly stated that no warranty or undertaking, whether expressed or implied, is provided, and the Audit Team accepts no responsibility for any direct or consequential loss arising from the use of the information, statements, or forecasts in the report.

This audit, constituting a thorough study based on the inspection and investigation of data collected over a specified timeframe, is explicitly not intended for legal action. The document is the exclusive property of the Society for Academic Facilitation and Extension (SAFE), a registered entity, and may not be copied or reproduced in any form. The report is prepared by the team of SAFE, with Dr. Ramesh Chandra serving as the Project Head and Secretary General of SAFE, who has conducted audits for multiple institutes to date. SAFE, as an organization, holds ISO 140001: 2015 and ISO 50001: 2018 certifications. The study is conducted in the capacity of an Accredited & Certified Green Professional with extensive experience in the field.

Acknowledgements:

We extend our sincere appreciation and gratitude to the esteemed members of the Managing Committee of Pandit Prithi Nath College, Kanpur, for their invaluable contributions and support in the completion of the Green Audit report. The dedication and collaborative efforts of the following individuals have played a pivotal role in the successful execution of this project:

Managing Committee:

- I. Mr. Yogendra Swarup – President
- II. Mr. Kulvinder Pal Singh Bathiya – Vice President
- III. Mr. Shailendra Kumar Singh – Secretary
- IV. Mr. Anil Kumar Srivastava – Joint Secretary
- V. Mr. Krishna Pal Singh – Member
- VI. Mr. Survanshu Kumar Shukla – Member
- VII. Smt. Sudesh Kumari (Nilu) - Member

College Officials:

- I. Prof. Anoop Kumar Singh, Principal, Contact: 9415126765
- II. Prof. Suman Singh, NAAC Coordinator
- III. Prof. Abha Singh, Director, IQAC
- IV. Mr. Suresh Kumar Tiwari, OS (Office Superintendent)
- V. Mr. Rajendra Kumar Kureel

Your leadership, guidance, and active participation have significantly contributed to the development of a comprehensive and insightful Green Audit report for Pandit Prithi Nath College. We appreciate your commitment to fostering a sustainable and environmentally responsible institution.

Thank you for your unwavering support.

Sincerely,

SAFE

Society for Academic Facilitation and Extension (Regd.)

1. Introduction:

Pt. Prithi Nath College, commonly referred to as P. P. N. College, stands as a distinguished postgraduate educational institution situated in Kanpur, Uttar Pradesh, India. With a venerable legacy dating back to the mid-twentieth century, the college has been steadfast in delivering high-caliber education across a spectrum of disciplines. Noteworthy are its offerings of 19 undergraduate and 13 postgraduate subjects encompassing Arts, Humanities, Social Science, Science, Commerce, Business Administration, Computer Applications, and DEIED/BTC.

Historical Background:

Founded in 1959 through the commendable endeavours of the eminent advocate, visionary educationist, and social activist Late Devendra Swaroop Ji (1912-1995), Pt. Prithi Nath College pays homage to Pandit Prithi Nath Chak (1859-1910) on the centennial of his birth. Pandit Ji, an ardent follower of Mahatma Gandhi, was a pivotal figure in the Indian independence movement and an advocate for the transformative power of education in societal progress.

Formative Years:

In its nascent phase, the college commenced operations with a modest student body and a limited array of courses, aspiring to provide higher education in arts and sciences to the youth of Kanpur and its environs.

Growth and Expansion:

Subsequently, Pt. Prithi Nath College experienced gradual yet substantial growth, emphasizing science, social science, and humanities. The institution evolved its academic portfolio to include undergraduate and postgraduate programs in various disciplines, responding dynamically to evolving student needs. This evolution established the college's reputation for academic excellence, rendering it a coveted institution in Kanpur.

Affiliation Transition:

Originally affiliated with Agra University, Pt. Prithi Nath College transitioned its affiliation to the newly established Kanpur University in 1966 (now known as Chhatrapati Shahu Ji Maharaj University), fostering expanded opportunities for growth and collaboration.

Infrastructural Advancements:

The institution underwent substantial infrastructural developments, constructing new facilities, expanding libraries, and incorporating modern amenities to accommodate a growing student populace and augment the overall learning environment.

Educational Contribution:

Pt. Prithi Nath College has made noteworthy contributions to Kanpur's educational landscape, producing graduates who have excelled in academia, government services, business, and the arts. Recognized for nurturing well-rounded individuals, the college remains committed to academic excellence and the holistic development of its students.

Contemporary Standing:

Presently, Pt. Prithi Nath College retains its esteemed status in Kanpur, offering a diverse array of undergraduate and postgraduate programs. Upholding its commitment to quality education and the intellectual and cultural growth of its students, the college boasts a seasoned faculty providing guidance and mentorship. Pt. Prithi Nath College remains dedicated to a holistic education experience, fostering extracurricular activities, sports, and cultural events through vibrant campus life and numerous student clubs.

In the contemporary landscape, Pt. Prithi Nath College persists as a distinguished postgraduate institution in Kanpur, renowned for its unwavering commitment to quality education and the comprehensive development of its students. Its historical significance and ongoing contributions underscore its pivotal role in shaping the educational ethos of the region and its continued impact on society at large.

Vision and Mission Statements:

Vision:

- *To empower students by providing them with the knowledge and skills essential for their desired careers while fostering their ability to contribute meaningfully to society.*

Mission

- *To establish the College as a premier institution for higher education, focusing on academic excellence.*
- *To offer affordable, quality education and research opportunities to all, including marginalized groups such as females and minorities.*
- *To nurture critical thinking and problem-solving skills in students, equipping them for success in an ever-evolving world.*
- *To cultivate empathy, environmental consciousness, and ethical values in students, promoting their holistic development as responsible global citizens.*
- *To prepare students to excel in their careers while promoting unity and fraternity in society.*
- *To instill a sense of responsibility towards environmental preservation and sustainable development.*

Natural Setting of the Institution:

The college is situated in an area that benefits from a balanced natural setting. The presence of greenery and open spaces in the immediate vicinity provides a refreshing backdrop to the academic landscape. This harmonious integration with nature enhances the entire aesthetic appeal of the campus. The proximity to essential amenities and services further enhances the appeal of PPN College's surroundings. Students have access to a range of facilities such as eateries, recreational spaces, and support services, contributing to their overall well-being and convenience. The natural beauty, accessibility, cultural richness, and community engagement all play integral roles in creating an environment that fosters learning, growth, and a sense of belonging. These factors collectively contribute to making PPN College, not just an academic institution but a vibrant hub of intellectual and cultural exploration.

Assessment of the Institution:

Affiliation

I: UGC-1959

II. NCTE-2013

Recognition

The College is recognized by the University Grant Commission (UGC) under sections 2 (f) and 12 (b) of the UGC Act, 1956 by the University Grants Commission, New Delhi.

2. Overview of the College:

Analysis for Academic year 2022-23

Student's data:

The student data (shared by the College) shows there were a total of **838 Boys** and **2355 Girl students**, thus there were a **total of 3193 students** in the college in the session 2022-23

Staff Data:

(2022-23)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	43	09	52
Total Staff Member	82	35	117

The staff data shows the premises had a total of **117** Staff Members.

Analysis for Academic year 2021-22

Student's data:

The student data (shared by the College) shows there were a total of **974 Boys** and **2281 Girl students**, thus there were a **total of 3255 students** in the college in the session 2021-22

Staff Data:

(2021-22)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	46	08	54
Total Staff Member	85	34	119

The staff data shows the premises had a total of **119** Staff Members.

Total College Area & College Building Spread Area:

The total site area is 3.343 Acres and the total Built-up area of the college is 79562.54 sq. ft.

College Infrastructure:

Establishment

The College was laid out in 1964. The Structure is a Supported Concrete Cement (RCC) system building. Generally speaking, the Foundation of the Structure is astounding as far as the Engineering Plan and Green Structure Plan. The Premises cover many of the necessities for a Green Territory.

Spatial Organisation

A friendly and welcoming atmosphere characterizes the College. Classrooms and other spaces have plenty of natural ventilation in the form of transparent fresh windows. The architecture of the building is quite well-planned. The color palette not only helps the building stand out but also provides an institutional arena. It balances local architecture with natural landscapes and huge trees. The focus of the design is based on the form of offering tranquillity and gradually blends into the peaceful landscape. Floor-to-floor height is over 12 feet. There are no lifts on the premises, but amenities include CCTV, fire extinguishers, a library, and a first aid kit.

Operation and maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarized in the

table. The Institution is open from Monday to Saturday. The detail-wise timing for each is mentioned below.

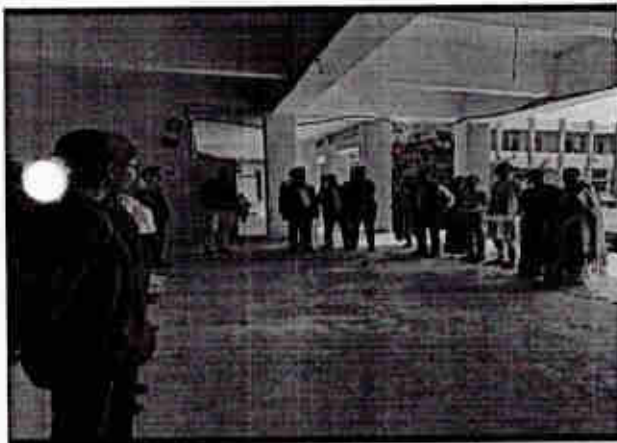
S. No.	Section	Days	Time	Hours/day	Days in a year
1	Teaching	Monday to Saturday	09.00 am to 03.00 pm	6	280
2	Non-teaching	Monday to Saturday	10:00 am to 05:00 pm	7	280

Table 3: Schedule of the timings of the premises

On-site investigation and physical verification

Audit Team during the visit on 15 March 2024

Photo



3. Green Building Study Audit

3.1. About the Green Building Study Audit

It is a systematic study of the aspects that make the Institution a sustainable and healthy premises for its inhabitants.

3.2. Analysis of the Green Building Study Audit

The procedure included detailed verification for the following:

Green Audit

- Green initiatives
- Waste Audit - Current waste produced, its segregation and usage; Strategies to be adopted for waste management and awareness
- Water Audit - Analysis of the current water consumption of premises; Scope to include Rainwater harvesting and Wastewater treatment in premises
- Hygiene audit

Green Audit

The increasing global warming and climate change have made us realize that apart from the enormous strategies the individual small efforts need to be taken by individuals and Educational Institutes as the younger generations are the future of the world and once, they are taught about these practices only then can we assume a better future.

1. Green practices

We observed the following points during the Site investigation and data verification of the premises; these are common for all the buildings on the premises.

- *The College uses water waste treatment by releasing water in the field. So that the level of underground water is maintained.*

Waste management - All the laboratories, classrooms, and cabin corridors have dust bins. Laboratories are having dustbins wastage; Plastic bags are strictly banned on the college premises and canteen.

Social awareness - The College has taken up awareness drives on various social issues for rural upliftment and regeneration in the college and surrounding villages.

Cleanliness Campaign - The Swachha Bharat Abhiyan is carried out on college premises as well as off-premises.

Fresh environment – The College provides an eco-friendly ambiance with fresh air and a soothing environment which helps to maintain a physical and mental balance. This kind of space is a must for an educational especially technical institute which is inviting and allows the stakeholders to explore indoor and outdoor learning to a great extent.

Silent and peaceful atmosphere – The College is located amidst residential areas which are well designed thus this helps to keep the pollution under control and provides a healthy ambiance.

Universal design – The College premises have special provisions such as ramps, and rails for the specially-abled.

Teamwork – The best quality of the College that sets it apart from other institutes is its coordinating and cooperative staff members, as for a building the foundation plays the most important role in its future similarly for an educational institute its staff members do.

Signages on the plants mentioning scientific names - *The practice of having the names of each plant and tree is executed by the College and is very beneficial*

1.1 Community Development

The various community development programs conducted include Tree Plantation, Life Learning, Employability Skill program introduced for the youth, Blood Donation Camp, Food Kit Distribution Program to the neighbourhood community, and Relief fund programs.

A lot of efforts are involved right from planning to execution. The main motive behind these is social welfare. This kind of thought process is highly admirable. We respect and congratulate the Institute for the same.

1.2 Eco-friendly initiatives undertaken

The Institution has undertaken the following important initiatives through **excellent efforts** towards saving environment measures.

Plantation Drive

- Embarking on a journey to enhance environmental sustainability in college, NCC cadets have conducted a tree plantation program to amplify our college's greenery.

Cleanliness Drive

- We rally individuals to commit to a cleanliness drive, fostering a sense of responsibility and encouraging a collective effort to maintain a clean and hygienic environment. NCC cadets, ANO, and Army personnel have conducted a Cleanliness Drive in the Pared area of Kanpur.

Anti-Plastic Awareness Rally

- Taking to the streets, our rally vehemently opposes plastic pollution, enlightening participants about its detrimental effects and advocating for reduced plastic usage. NCC cadets, ANO, Army personnel, and Police have also participated in the Anti-Plastic Awareness Rally.

Swachh Bharat Abhiyan Rally and Cleanliness Programme

- Active participation in the Swachh Bharat Abhiyan involves a spirited rally and a dedicated cleanliness program, contributing to the national mission for a cleaner India. NCC cadets, ANO, and Army personnel have participated in the Cleanliness Drive in the Naveen Market area of Kanpur.

Geotagging of Plantation Drive

- Leveraging geotagging technology, NCC cadets and ANO have taken the initiative to meticulously



document and track the progress of tree plantation drives on Government directions, ensuring transparency and accountability in our conservation efforts.

Plastic Pollution Drive

- Hosting a thought-provoking conference, we delve into the challenges of plastic pollution, explore sustainable solutions, and advocate for alternatives to preserve our environment. NCC cadets of the college Unit organized the program.

Historical Pond Restoration

- Undertaking the restoration of historical ponds, our initiative focuses on preserving our heritage and creating a sustainable ecosystem for future generations. On the directions of the Group headquarters, a pond restoration was organized in CSA University's old pond in collaboration with 55 UP NCC BN and College NCC Unit.

Cycle Rally for Swatchhta

- Promoting cleanliness and a healthy lifestyle, our cycle rally emphasizes using cycles for daily commuting, encouraging sustainable transportation practices. The program was organized by the NCC Unit of the college.

Blood Donation Camp

- Encouraging voluntary blood donations, our camp addresses local healthcare needs and highlights the importance of selfless contributions. The program was organized by the Medical Cell along with the help of the NCC Unit.

Ganga Yatra

- Engaging in activities to raise awareness about the conservation of the Ganga River, our initiative fosters a sense of responsibility toward preserving this vital water source. The NCC Unit of the college organized the program.

Bicycle Rally

- Promoting eco-friendly transportation, our bicycle rally advocates for the use of bicycles as a sustainable and healthy mode of commuting.

Fit India Run 2.0

- Encouraging a healthy lifestyle, Fit India Run 2.0 promotes physical fitness and well-being through a community-wide running event.

Road Safety Program

- Promoting road safety awareness, our program educates the community on safe practices and measures to prevent accidents on the road.

1.3. Survey Results



- An online survey was conducted to analyse the student and staff views about the Environment, Green and Energy management practices adopted in college, following is the result received.

1.3.1 Participation

Total 889 responses have been recorded included staff and students.

क्या आपको पर्यावरण संबंधी मुद्दों के बारे में जानकारी है?

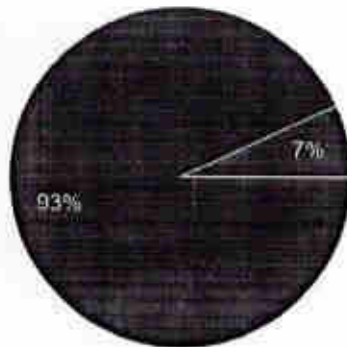
888 responses



● हाँ
● नहीं

क्या आपको लगता है कि आप और आपका कॉलेज पर्यावरण के प्रति सजग है?

888 responses



● हाँ
● नहीं

2. Waste Audit

Waste is an unavoidable part of our lives. Over the years, increased awareness of waste management techniques has led to rethinking ways to avoid waste ending up in landfills. The audit will examine the types of waste generated, waste collection locations, disposal techniques used, waste separation methods used, and any new methods that can be applied to keep the facility clean. Approximate information on management strategies can be obtained. Sustainability here refers to a broader aspect

that analyzes whether current technologies have a positive or negative impact on building stakeholders.

2.1. Waste produced

2.1.1. Types and Disposal of Waste in Premises

The types of waste collected in the premises are as follows, these are separated before processing

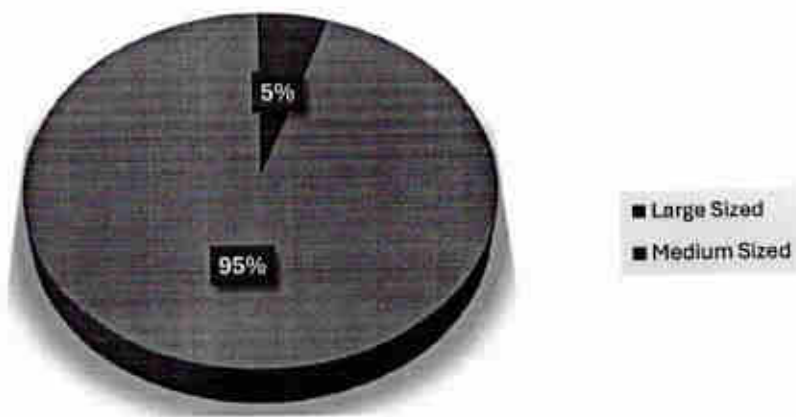
S. No.	Type of waste	Source and quantity	Current Disposal method	Can it be treated/ recycled?	Methodology
2	Paper waste	Newspaper and other paper	Sold to vendor	Yes	CONTINUE - with the current practice
3	E-waste	Computers - Non-biodegradable waste as per the annual year usage	Given to vendor	Yes	CONTINUE - with the current practice
4	Dry waste in the form of leaves	Open space & plantations, papers - Non biodegradable waste	TREATED - Organic composting is undertaken	Yes	TREATED - Organic composting can be undertaken
5	Liquid waste	Toilets, washbasins - Around 100 - 120 liters per week during general times and 50 liters at present	TREATED - Sewage treatment plant	Yes	CONTINUE - with the current practice
6	Organic regular waste	Dust, dirt usually dry waste from Canteen and all sources - approx. 3 to 5 kg	TREATED - Organic composting is undertaken	Yes	TREATED - Organic composting can be undertaken

Table : Summary of the types of waste produced in the premises

2.1.2. Bins Summary

There are 45 Dustbins on the premises with a volume of 7 liters (small), 15 liters (medium), and 30 liters (large). The analysis of dustbins is presented below.

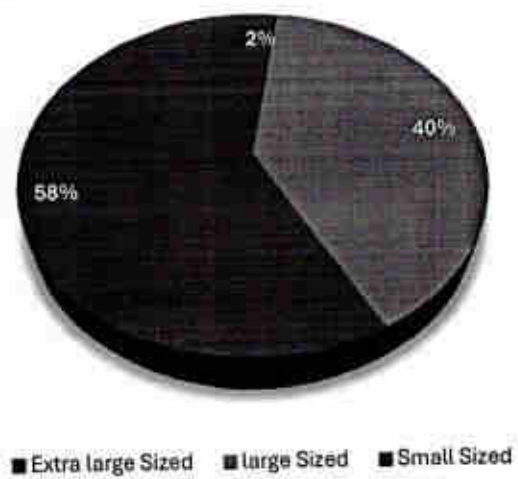
No.Of Dustbins



Analysis of dustbins location-wise in the premises

The above analysis shows that 100% are present in the Indoor areas and 0% in the outdoor areas.

No. Of Dustbins



Analysis of dustbins Size-wise in the premises

Among the dustbins that are present on the premises, 58% are small-sized bins, whereas 40% are medium-sized bins and 2% are large-sized dustbins.

Waste handling

Quantification As per the survey it was found the following types of waste Solid, Liquid, Hazardous Waste, Dry leaves, E-Waste, Canteen waste, and Unused Equipment waste. The waste produced on

premises is segregated. It is collected every week. The waste is not handed over to the local municipality van. There is a dumping pit in the garden which should not be there.

Waste management

The College reuses the papers. Ample measures are taken to maintain hygiene. No smell problems or health-related issues due to the waste are there. There are adequate numbers of bins present in all parts of the building. The waste does not pollute the ground or surface water. There is no problem of air pollution from waste as informed. The wastes from toilets are discharged to main drains through underground covered channels (Safety Tanks) thus avoiding any incident.

Recommendations for a Sustainable Habitat

The following practice can be adopted for further up gradation.

a) *Twin Dual Litter Dustbin Bins*

There should be more dual litter dustbins at various locations in areas such as the Canteen, and open spaces. This would inculcate the awareness of waste segregation among students.

b) *Material of the dustbin*

The current plastic dustbins should be replaced with eco-friendly material.

3. Water Audit

Water is one of the essential requirements. Unadulterated drinking water is an asset that should be safeguarded effectively. Water review assists with recognizing the wellsprings of water utilization, and the water prerequisite by the grounds met by these sources. The focus and powerful use of with no wastage. Understanding the strategies that are the most ideal for the site to increment water protection with regards to mindfulness and practice

3.1 Water availability and consumption

3.1.1 Sources of Water Supply

Well – There are 2 wells available on the site which are used as underground water facilities with daily water being pumped using submersible pumps. Daily water is pumped from per well for usage depending on the need.

3.2 Water requirement

The main areas of water requirement and type of usage are as follows

- **Drinking water** – Consumption of around 850-950 liters of water through an Aquaguard-like system

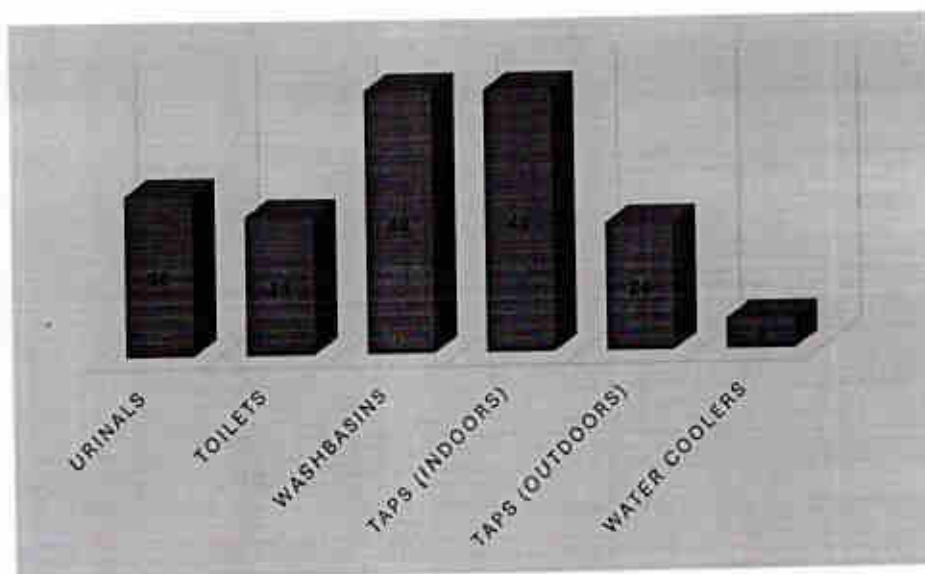
available in the premise, the taps, and the water cooler.

- **Toilet blocks**– General usage by occupants in toilets, urinals, bathrooms, wash basins using approx. 400-600 litres of water daily
- **Cleaning of the premises** – The entire Institution is very well-maintained concerning hygiene and cleaning is one of the major uses of water requirement. The toilet areas are cleaned twice daily.
- **Garden and surrounding open space** – Cleaning, and watering the plants requires approximately more than a good amount of water, keeping in mind the scale of the open spaces there is a supply system connected directly, and the plants, and trees are hardly watered regularly. The sprinkler system is practiced at present.

3.3 Areas of water usage

Based on the inventory done and data shared by the staff it was found that the premise has the following facilities:

- Urinals – 30 Nos.
- Toilets – 26 Nos.
- Washbasins – 49 Nos.
- Taps (Indoors) – 49 Nos.
- Taps (Outdoors) – 24 Nos.
- Water Coolers - 06 Nos.



As per the data shared by the College and on-site observation, it was noted that there is no water wastage of water in the form of Cleanliness of toilets.

Site investigation of water management.

The College has an excellent management system which is very appreciable. We have observed the following points.

- There is **no water leakage in the entire premise**; the pipes are well maintained with adequate hygiene.
- **The premise has efficient water management in terms of operations and maintenance.** The toilets are kept very tidy and are cleaned every day.

The wastewater does not mix with groundwater and gets directed to stormwater drains. There are sufficient numbers of taps on the premises.

Recommendations for a Sustainable Habitat

Since there are already multiple steps undertaken only one suggestion has been put forth as follows:

Waterless urinals - There can be provision of waterless urinals as a Green Building initiative in the premises, either the existing ones can be replaced with such a facility or new toilets can be constructed in this manner.

Health and Hygiene Audit

Practicing good hygiene is essential to our everyday existence. Maintaining the cleanliness of the surrounding area in the same way that we would like our homes to be is vital. Educational institutions have a greater responsibility to improve young people's minds via sanitary practices.

Facilities available

The Institution has the following facilities as part of the premises.

- Washroom facility in each of the buildings.
- Hand wash facility
- Drinking water facilities in the form of Water coolers and taps
- Ample number of dustbins on the premise

Smoke Exposure

As per the Site visit the following analysis **has a positive impact on premises.**

- There is no air pollution as a result of the trash not being burned on the property.

- ✓ The campus is smoke- and tobacco-free, which aids in the institution's transition to a healthy one.
- ✓ There is parking available on campus. Due to this, there is a small dust problem, but it is offset by the excellent greenery there.

Hygiene

As per the Site visit the following analysis **has a positive impact on premises.**

- For the overall hygiene of the students and staff there are facilities such as a Washroom facility on the ground floor.
- The staff keeps a regular check on the operation and maintenance of the equipment on each floor.
- Water management initiative with appropriate hygiene is undertaken. The areas of water tanks in the site on the ground floor are clean and no mosquito breeding spots are there.
- There are pest control programs practiced with appropriate sanitation facilities and an Annual Maintenance Contract for pest control is done once a year by professional Pest control units
- As part of the Tree Plantation programme the initiative of **Swachh Bharat Abhiyan of Govt. of India** is undertaken during various occasions.

On-site investigation

During the physical verification of the site, the following points were noted.

- All the facilities are cleaned daily.
- The Maintenance staff are allotted the responsibility of washroom hygiene and they do a very commendable and excellent job of maintaining the hygiene of the premises.

Recommendations for a Sustainable Habitat

As per site verification for this audit, the efforts of the College are highly appreciable as they are very well maintained. However, the college should practice pest control programs with appropriate sanitation facilities through an appropriate agency and install additional Sanitary vending machines and incinerators at appropriate locations.

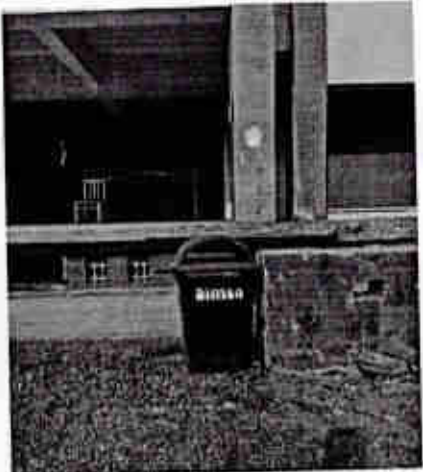
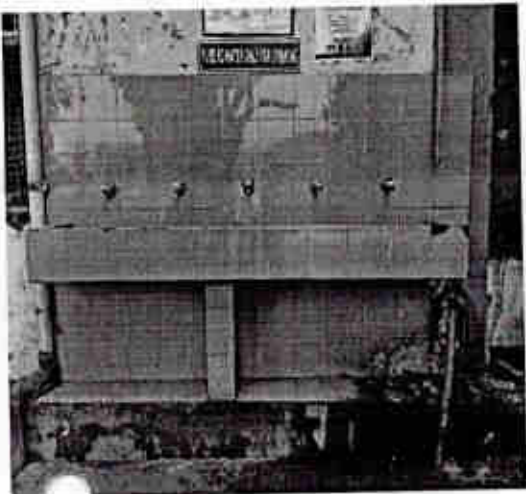
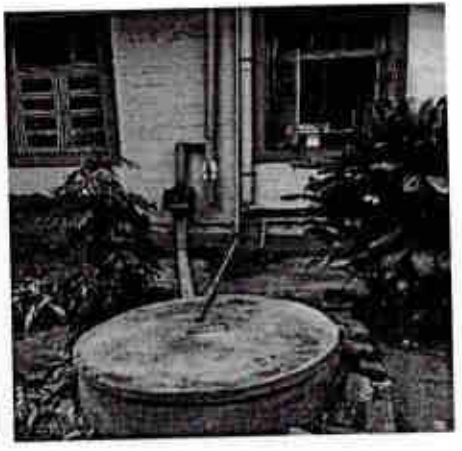
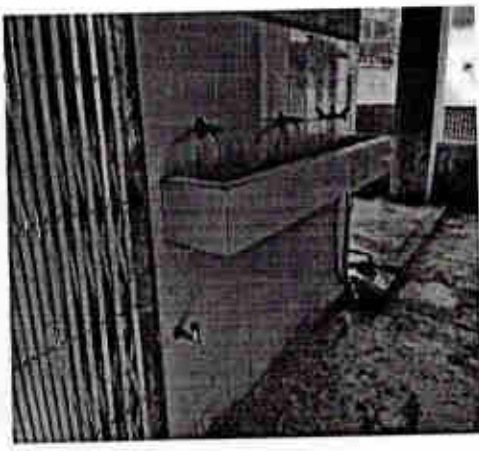
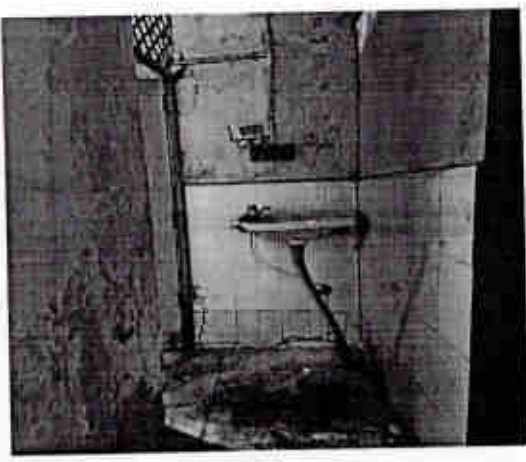
5. Site visit Audit inferences

The College had an offline audit and the report has been prepared based on the inputs provided for immediate action for improvement in this subject. The aspects are listed below.

- **Signing of a MoU for improvement w.r.t. to Green Building aspects of premises** – The same has been suggested before the visit.
- **Articles and Documentation** – The premises have multiple features which add to the beauty of nature and improve the environment in the premises, it is thus suggested to have an article written every month as guided by the Team.
- **Determination of plastic zones** – The study and execution can be undertaken through a pilot project where the waste plastic can be collected through areas within 5 km of the premises and a product can be developed with experts who have conducted the audit.
- **Net zero carbon reduction projects** – This is a pilot project where each student will plant at least 6 projects, the scope and detailed plan of action will be informed by the team as per the MoU with experts who have conducted the audit.
- **Scientific name plates as QR codes** – The NSS and NCC team should undertake a project to have QR code name plates on every plant on the premises. It can be undertaken with an expert who has conducted the audit.

On-site investigation and physical verification

Facilities related to water and cleanliness, hygiene practices on the premises



ENVIRONMENT AUDIT



A Sustainable Study by Valid 15 March 2025

ISO 50001: 2018 & ISO 14001:2015

Society for Academic Facilitation and Extension (Regd.)

53 Karmachari Nagar, Bareilly (U.P.)

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Vision and Mission Statements:

Vision:

- *To empower students by providing them with the knowledge and skills essential for their desired careers while fostering their ability to contribute meaningfully to society.*

Mission

- *To establish the College as a premier institution for higher education, focusing on academic excellence.*
- *To offer affordable, quality education and research opportunities to all, including marginalized groups such as females and minorities.*
- *To nurture critical thinking and problem-solving skills in students, equipping them for success in an ever-evolving world.*
- *To cultivate empathy, environmental consciousness, and ethical values in students, promoting their holistic development as responsible global citizens.*
- *To prepare students to excel in their careers while promoting unity and fraternity in society.*
- *To instill a sense of responsibility towards environmental preservation and sustainable development.*

Natural Setting of the Institution:

The college is situated in an area that benefits from a balanced natural setting. The presence of greenery and open spaces in the immediate vicinity provides a refreshing backdrop to the academic landscape. This harmonious integration with nature enhances the entire aesthetic appeal of the campus. The proximity to essential amenities and services further enhances the appeal of PPN College's surroundings. Students have access to a range of facilities such as eateries, recreational spaces, and support services, contributing to their overall well-being and convenience. The natural beauty, accessibility, cultural richness, and community engagement all play integral roles in creating an environment that fosters learning, growth, and a sense of belonging. These factors collectively contribute to making PPN College, not just an academic institution

but a vibrant hub of intellectual and cultural exploration.

Assessment of the Institution:

Affiliation

- I: UGC-1959
- II. NCTE-2013

Recognition

The College is recognized by the University Grant Commission (UGC) under sections 2 (f) and 12 (b) of the UGC Act, 1956 by the University Grants Commission, New Delhi.

2. Overview of the College:

Analysis for Academic year 2022-23

Student's data:

The student data (shared by the College) shows there were a total of 838 Boys and 2355 Girl students, thus there were a total of 3193 students in the college in the session 2022-23.

Staff Data:

(2022-23)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	43	09	52
Total Staff Member	82	35	117

The staff data shows the premises had a total of 117 Staff Members.

Analysis for Academic year 2021-22

Student's data:

The student data (shared by the College) shows there were a total of 974 Boys and 2281 Girl students, thus there were a total of 3255 students in the college in the session 2021-22

Staff Data:

(2021-22)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	46	08	54
Total Staff Member	85	34	119

The staff data shows the premises had a total of 119 Staff Members.

Total College Area & College Building Spread Area:

The total site area is 3.343 Acres and the total Built-up area of the college is 79562.54 sq. ft.

College Infrastructure:

Establishment

The College was laid out in 1964. The Structure is a Supported Concrete

Cement (RCC) system building. Generally speaking, the Foundation of the Structure is astounding as far as the Engineering Plan and Green Structure Plan. The Premises cover many of the necessities for a Green Territory.

Spatial Organization

A friendly and welcoming atmosphere characterizes the College. Classrooms and other spaces have plenty of natural ventilation in the form of transparent fresh windows. The architecture of the building is quite well-planned. The color palette not only helps the building stand out but also provides an institutional arena. It balances local architecture with natural landscapes and huge trees. The focus of the design is based on the form of offering tranquillity and gradually blends into the peaceful landscape. Floor-to-floor height is over 12 feet. There are no lifts on the premises, but amenities include CCTV, fire extinguishers, a library, and a first aid kit.

Operation and maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarized in the table. The Institution is open from Monday to Saturday. The detail-wise timing for each is mentioned below.

S. No.	Section	Days	Time	Hours / day	Days in a year
1	Teaching	Monday to Saturday	09.00 am to 03.00 pm	6	280
2	Non-teaching	Monday to Saturday	10:00 am to 05:00 pm	7	280

Table : Schedule of the timings of the premises

On-site investigation and physical verification

Audit Team during the visit on 14 March 2024

Photo



Green Building Study Audit

About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution a sustainable and healthy premises for its inhabitants.

Analysis for the Green Building Study Audit

The procedure included detailed verification for the following:

Environmental Audit

- Analysis of the current landscape + hardscape of campus
- Analysis of the flora and fauna of campus
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of the premises.

Strategy adopted for Green Building Study Audit

The strategies included data collection from admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collected and preparation of the Report.

Site Study

The following listed are some of the positive site elements which are beneficial to the College in terms of tangible and intangible benefits.

- **Location** - Pt. Prithi Nath (PG) College, Kanpur located at 96/12, Mahatma Gandhi Marg, Kanpur - 208001, U.P. India.
- **Neighborhood context** - The premises is surrounding by open spaces and Residential, Commercial and Educational areas on the immediate surroundings of the site.
- **Natural physical features** – The premises includes a Poor biodiversity and less number of plants in the adjacent open space.
- **Manmade features** – The premises is situated in an urban area amidst residential areas and open spaces with appropriate proximity to necessary amenities. There is sufficient appreciation space for entrance. The materials used for construction are RCC and the landscaping includes innumerable natural trees as well as potted plants.

- **Climate** – The climate in Kanpur is mild and moderate. In winter, there is much less rainfall than in summer. The climate here is classified as Cwa by the Köppen-Geiger system. The average annual temperature in Kanpur is 25.3°C | 77.5 °F. The annual rainfall is 939 mm | 37.0 inch. (Source: [Kanpur climate: Weather Kanpur & temperature by month \(climate-data.org\)](#)).

Ecological (Environmental) Audit

The environment is crucial to human life. The environment cannot be referred to as a distinct entity because we coexist with it. The ecological audit facilitates comprehension of the current state of the flora and fauna as well as possible improvements. To indicate whether there are any audio-related issues in the immediate area. Regarding the carbon footprint, it assists in monitoring the environmentally conscious behaviors adopted by the building's occupants. Today, the most important thing is people's health; adequate hygienic habits and a widespread awareness of the actions performed are accepted. Universal design is appropriate for both constructed and unconstructed areas.

As part of our study we could state that the Institution has developed eco-friendly practices and sustainable solutions which are well reflected in the less biodiversity of the Premises. Being situated in the city the appreciation space towards the main entrance provides a welcoming approach to the College.

The College has open space used by all. The students use it as a leisure place for study and College ground is used for sports activities. There are ample resting spaces as part of building design which provide a resting and warm welcoming approach in the premises.

Open Spaces

There is a beautiful balance of natural and open spaces in the premises and the open/vegetation spaces are balanced overall. The ground is used by students at present for

sports and cultural gatherings. The design on the entire is such that the landscape and softscape spaces are very well oriented and located thus being extremely useful to Institutions in the site. **There are provisions for natural plantations which have enhanced the beauty of the space.**

The Maintenance staff allotted for the upgrading the open spaces and they have done an excellence job in terms of the duty allotted. The infrastructure committee too is involved in this process. The traditional tap and pipe facility is adopted for watering and the College has taken special provisions for the same. The spaces are watered daily in summer.

The efforts to maintain the existing space are commendable.

Flora and fauna audit

Flora Audit

A flora survey was carried out to identify the total numbers of plants and trees every year. The landscape area has a variety of plantations constituting hundreds of surveyed trees in premises in the last few years as follows with detail description of each.

S. No.	Plant name	Type (Plant, tree, herb, shrub)	Nos.
1	Bel	Tree	2
2	Ashok	Tree	10
3	Palm	Tree	1
4	Shami	Tree	2
5	Gulmohar	Tree	1
6	Gowava	Tree	6
7	Neem	Tree	1
8	Saptaparni	Tree	3
9	Pakadi	Tree	1
10	Mango	Tree	1
11	Thuja	Tree	8
12	Tikoma	Tree	4
13	Silverfur	Tree	1
14	Cycas	Tree	4

15	Triangle Palm	Tree	1
16	Mador	Tree	2
17	Snake Plant	Tree	20
18	Alovera	Tree	30
19	Uphorbia	Tree	10
20	Adenium	Tree	25
21	Pedelanthus	Tree	4
22	Zade Plant	Tree	100
23	Rose	Tree	4
24	Ganda	Tree	100
25	Orenge Flame Vine	Tree	20
26	Byro Phyllum	Tree	50
27	Plumaria	Tree	30
28	Vroton	Tree	10
29	Rubber Plant	Tree	1
30	Tradescantia	Tree	20
31	Bottel Brush	Tree	2
32	Guldhul	Tree	4
33	Ficus	Shrub	8
34	Jetfofa	Tree	5
35	Haemelia	Tree	2
36	E Palchiraima	Tree	1
37	Kathal	Tree	1
38	Sarpgandha	Tree	10
39	Mithi Neem	Tree	1
40	Ferns	Tree	10
41	Haldi	Tree	2
42	Elaichi	Tree	1
43	Long	Tree	1
44	Dalchini	Tree	1
45	Tirebush	Tree	1
46	Ashwagandha	Tree	2
47	Manocamani	Tree	4
48	Musaunda	Tree	1
49	Chandani	Tree	1
50	Ixora	Tree	1
51	Hibiscus	Tree	1
52	Mutabilis	Tree	1
53	EricaPlam	Tree	1
54	Kaner	Tree	6
55	Tulsi		10

Table : Details of the Flora in the premises

At present there are 550+ plantations comprising of trees and shrubs. All of these are planted on various occasions while some have grown naturally. Timely maintenance with sufficient care has resulted in positive benefits for the surroundings.

Fauna Audit

It is a beautiful site to have the birds chirping around the College premises. It highlights the ecological co-existence concept in the most beautiful way.

Noise Audit

Macro level

On a macro level, the college is situated in a city with moderate traffic noise. However, there are open grounds on the site, and the approach road experiences minimal traffic. Despite being surrounded by residential areas with sparse vegetation, the noise levels do not significantly impact the students and staff in their daily activities. Moreover, the proximity of the approach road contributes to the overall low noise levels.

Our macro-level analysis indicates that the adverse effects of noise pollution are minimal, with positive outcomes observed.

iii) Micro-level

The College has an adequate open space covered with huge trees prevailing naturally in the premises which act as a noise barrier; in addition, the Institution building is surrounded by Residential Buildings which further act as a benefit in reducing any noise pollution. There are parking provisions provided in the premises which causes minimum noise as they are situated near the entrance.

There are no particular equipment's which cause any noise effect. **Overall, the noise levels inside the premises are low that is a good approach.**

Carbon Footprint Audit

Eco-friendly Commuting Practices

Based on data collection and discussion with staff the following points were noted:

- **Ease of commuting** – Owing to close proximity to public transport the access is very feasible and walk able.

- **Parent's commute** - There are 2 Parent-teacher meetings held in a year and the turn-out is around 40-60%
- **Vehicles details** – The provision provided by college includes vehicle parking is allowed at present as follows.

1.	Cars	15-20	Staff
2	Bikes	25-30	Staff and Students
3	Cycles	40-50	Students
4	Electric vehicles	0	Staff and Students

Table : Details of the Parking in the premises

Heat Island Reduction

The Institution has **adopted the following practices which are yielding positive results** in terms of Urban Heat Island Effect which refers to increase in temperature of the surrounding because of ineffective strategies.

- **Exposed roof areas** – The top floor is absolutely clean and well maintained. The buildings are covered with white paint and the Maintenance staffs along with Management have taken ample measures to maintain the same. **There was no weathering of roof observed. The current practices are well maintained.**
- **Exposed non-roof hardscape areas** - There are pathway on all sides of the premises. These include some natural and potted plantations along the pathways. Huge garden spaces are available in the premises.

There are adequate measures adopted in the premises to reduce heat island effect of Building roofs and in site.

Outdoor Light Pollution Study

The College compound lights are not upward looking thus, these do not cause light pollution.

Universally accessible premises

As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India. **There are Ramps, Handrails along staircase and low height risers in the Staircases as part of universal campus initiatives.** The design of the premises is appropriate for access with passages and corridors being wide enough in size and naturally ventilated. The doubly and singly loaded corridors are safe from fire safety aspect. The College has resting places (seating areas) in the outdoor along the trees thereby making it user friendly for the especially abled students.

Fire Safety

The Institution has undertaken adequate fire safety measures. Each floor has an open staircase without any barriers for fire safety measures. These staircases are free of any kind of storage or combustible material. The windows in each classroom are at a low height with fresh air and natural light thereby adding to ample ventilation throughout the day.

The College should adopt additional fire safety practices such as fire hydrant, sprinkler, and fire alarm in future.

Survey Results

An online survey was conducted to analyse the views about the premises, following are some of the reviews.

Participation

A total of 889 responses have been recoded included staff and students.



What according to you are the positive steps taken by the College towards Green Building/ Good maintenance?

We have listed some of the key responses below.

- Clean every area
- Because our all Teachers are very reasonable for the nature and our



environment of the word so my collages grounding is green by the plant's green trees and other flowers plant.

- Good faculty of maintaining of collage buildings and better settlement of dustbins and other cleaning activities.
- Encouraging students toward planting trees saving water conducting speeches on such topics and giving prizes to keep our moral up towards these practices
- No mobile zone.

Positive site features as per our study

a) Avoid using plastic in premises

There are provisions for ban on the use of plastic bags or products in the Premises.

b) OPAC system

The system in the library is beneficial for the students.

c) User friendly movability in premises

There are provisions for Kerb Ramp near the main entrance of the building premises, also low height hand rail for ease of access.

Recommendations for a Sustainable Habitat by SAFE

Site beautification

a) Additional facilities for birds

There can be provision for drinking water and food facility for birds visiting the College premise.

Heat island reduction

a) Cool rooftops

It is suggested that the College gets the Terrace roofs painted with Cooltop as it will help reduce the temperature of the spaces.

Pollution Control

a) Promote the use of Eco-friendly vehicles

There can be provision for battery-operated vehicles/ low emission vehicles such as

electrically driven vehicles parking in open spaces along with battery charge points, this would inspire students to change their mode of transportation and adopt sustainable practices.

b) Bicycles as a gift

As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.

c) Paperless technologies for offices

The college can go technology-friendly and go paperless in the functioning of the Premise to a certain extent maybe not fully.

d) Plant more carbon dioxide absorbing plants



Specific plantations such as follow should be planted as they will help in Carbon neutralization.

- Pine – It is known for its ability to sequester carbon.
- Neem – It helps to reduce greenhouse gases through photosynthesis absorbing large quantities of CO₂ and producing oxygen.
- Peepal – It can uptake CO₂ during the night as well because of its ability to perform a type of photosynthesis called Crassulacean

Acid Metabolism (CAM)

- Bamboo - It can absorb as much as 12 tonnes of carbon dioxide per hectare per year, giving the plant a potentially crucial role in



stabilising our planet's atmosphere.

- Teak – It has the highest capacity for carbon sequestration among trees in India. This is the finding of a study conducted by the Gujarat Ecological Education and Research (GEER).



Responsible environment systems

Community gardening.

There can be provisions for community gardening in addition to allowing the general public to use the parks on the premises for walks and jogging.



Towards a Healthy & Sustainable Institution

INPUTS BY SAFE

Based on the analysis of the study of premises in addition to the recommendations provided in each section of Ecological, Water, Waste, and Energy Audit the University can adopt the following strategies for a Healthy and Sustainable Institution practices.

- a) **Cutlery in the Canteen** – The regular plastic and steel plates, and spoons used in Canteen can be replaced with eco-friendly and organic leaves, paper straws, disposable plates, edible spoons, and tables made out of sugarcane waste or bamboo. This will be the first of its kind initiative to be adopted and practiced thus also inculcating healthy practices in students.
- b) **Environment Certificate Courses** – The College could begin courses such as Bachelor's, Diploma, or Certificate courses with National and International Collaboration related to Environment as part of the courses provided. Though, this is not a requirement or compulsion.
- c) **Terrace farming** - There can be the provision of terrace farming in a designated area of the open space this would enhance the biodiversity and be useful in training students and staff about the healthy practices and food grown which would be used in Canteen. It helps in smaller steps are taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, and terrace garden there will be a long term benefit for the environment as a whole.
- d) **Signages** – In addition to the signages being in regular language there can be additional signages in braille language for the specially-abled students.

Survey Results

An online survey was conducted to analyse the student and staff views about what changes according to you can be undertaken for Green audit improvement in College premise and activity. **Some of the suggestions are listed below:**

- Awareness program for stopping the single use plastic and stopping the misuse of water and energy among students and society should be run regularly.
- According to me, the best improvement is to try to preserve the greenery that is available.
- Plant more carbon dioxide absorbing plants like Pine, Neem, Peepal, Bamboo, Banyan which will help in Carbon Neutralising.
- Ozone conservation and more activities
- Shady tree cover should be increased and flowering plants should be used at appropriate places.
- A special team for sustainable development.
- There can be join the student to other government green programme.

However, it should be noted that the College has taken up multiple initiatives and because of Pandemic the students have not practically visited the premises so many of these points are not mandatory at the moment.

2. References

1. Uniform Plumbing Code – India, 2008
2. IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
3. IGBC Green Landscape Rating system, March 2013
4. BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
5. Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.
6. Climate data <https://en.climate-data.org/asia/india/uttar-pradesh/kanpur-5844/>

R-52



ENERGY AUDIT

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Contemporary Standing:

Presently, Pt. Prithi Nath College retains its esteemed status in Kanpur, offering a diverse array of undergraduate and postgraduate programs. Upholding its commitment to quality education and the intellectual and cultural growth of its students, the college boasts a seasoned faculty providing guidance and mentorship. Pt. Prithi Nath College remains dedicated to a holistic education experience, fostering extracurricular activities, sports, and cultural events through vibrant campus life and numerous student clubs. In the contemporary landscape, Pt. Prithi Nath College persists as a distinguished postgraduate institution in Kanpur, renowned for its unwavering commitment to quality education and the comprehensive development of its students. Its historical significance and ongoing contributions underscore its pivotal role in shaping the educational ethos of the region and its continued impact on society at large.

Vision and Mission Statements:

Vision:

- *To empower students by providing them with the knowledge and skills essential for their desired careers while fostering their ability to contribute meaningfully to society.*

Mission

- *To establish the College as a premier institution for higher education, focusing on academic excellence.*
- *To offer affordable, quality education and research opportunities to all, including marginalized groups such as females and minorities.*
- *To nurture critical thinking and problem-solving skills in students, equipping them for success in an ever-evolving world.*
- *To cultivate empathy, environmental consciousness, and ethical values in students, promoting their holistic development as responsible global citizens.*
- *To prepare students to excel in their careers while promoting unity and fraternity in society.*
- *To instill a sense of responsibility towards environmental preservation and sustainable development.*

Natural Setting of the Institution:

The college is situated in an area that benefits from a balanced natural setting. The presence of greenery and open spaces in the immediate vicinity provides a refreshing backdrop to the academic landscape. This harmonious integration with nature enhances the entire aesthetic appeal of the campus. The proximity to essential amenities and services further enhances the appeal of PPN College's surroundings. Students have

access to a range of facilities such as eateries, recreational spaces, and support services, contributing to their overall well-being and convenience. The natural beauty, accessibility, cultural richness, and community engagement all play integral roles in creating an environment that fosters learning, growth, and a sense of belonging. These factors collectively contribute to making PPN College, not just an academic institution but a vibrant hub of intellectual and cultural exploration.

Assessment of the Institution:

Affiliation

I: UGC-1959

II. NCTE-2013

Recognition

The College is recognized by the University Grant Commission (UGC) under sections 2 (f) and 12 (b) of the UGC Act, 1956 by the University Grants Commission, New Delhi.

2. Overview of the College:

Analysis for Academic year 2022-23

Student's data:

The student data (shared by the College) shows there were a total of 838 Boys and 2355 Girl students, thus there were a total of 3193 students in the college in the session 2022-23.

Staff Data:

(2022-23)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	43	09	52
Total Staff Member	82	35	117

The staff data shows the premises had a total of 117 Staff Members.

Analysis for Academic year 2021-22

Student's data:

The student data (shared by the College) shows there were a total of 974 Boys and 2281 Girl students, thus there were a total of 3255 students in the college in the session 2021-22

Staff Data:

(2021-22)	Male	Female	Total
Teaching staff	39	26	65
Non-Teaching staff	46	08	54
Total Staff Member	85	34	119

The staff data shows the premises had a total of 119 Staff Members.

Total College Area & College Building Spread Area:

The total site area is 3.343 Acres and the total Built-up area of the college is 79562.54 sq. ft.

College Infrastructure:

Establishment

The College was laid out in 1964. The Structure is a Supported Concrete Cement (RCC) system building. Generally speaking, the Foundation of the Structure is astounding as far as the Engineering Plan and Green Structure Plan. The Premises cover many of the necessities for a Green

Territory.

Spatial Organization

A friendly and welcoming atmosphere characterizes the College. Classrooms and other spaces have plenty of natural ventilation in the form of transparent fresh windows. The architecture of the building is quite well-planned. The color palette not only helps the building stand out but also provides an institutional arena. It balances local architecture with natural landscapes and huge trees. The focus of the design is based on the form of offering tranquility and gradually blends into the peaceful landscape. Floor-to-floor height is over 12 feet. There are no lifts on the premises, but amenities include CCTV, fire extinguishers, a library, and a first aid kit.

Operation and maintenance of the premises

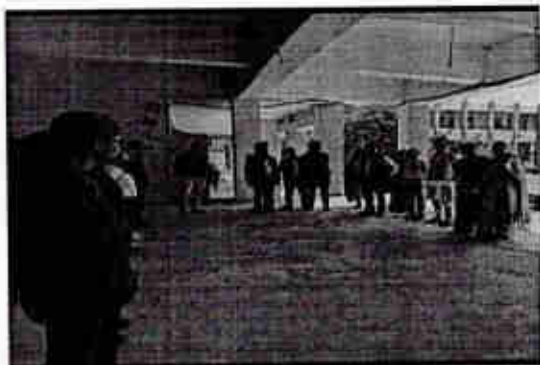
The interview session with the staff regarding the operation and working hours is summarized in the table. The Institution is open from Monday to Saturday. The detail-wise timing for each is mentioned below.

S. No.	Section	Days	Time	Hours/day	Days in a year
1	Teaching	Monday to Saturday	09.00 am to 03.00 pm	6	280
2	Non-teaching	Monday to Saturday	10:00 am to 05:00 pm	7	280

Table : Schedule of the timings of the premises

On-site investigation and physical verification Audit Team during the visit on 14 March 2024

Photo



1. Green Building Study Audit

About the Green Building Study Audit

It is a systematic study of the aspects which make the Institution a sustainable and healthy premises for its inhabitants.

Analysis for the Green Building Study Audit

The procedure included detailed verification for the following:

Energy Audit

- Analysis of the Lights, Fans, AC, Equipment
- Renewable energy
- Scope for reducing the current energy bills if any
- Improvement in the thermal comfort of the premises

Strategy adopted for Green Building Study Audit

The strategies included data collection from admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collected and preparation of the Report.

2. Energy Audit

Sources of Energy consumption

The premise uses following sources of energy consumption.

Primary sources

- ⇒ **Electrical (Metered)** – Light, Fans, Equipment's, Pumps comprise these sources.
- ⇒ **Renewable energy** – There are sources of renewable energy available.

In a table Nos. and amount spent in a month for Gas cylinders, UPS, Inverter, battery in premise.

S. No.	Item	Nos	Amount spent
1	Gas cylinders	01 CUGL Connection	2000
2	Inverter	08	1000
3	battery	10	1000

Site investigation analysis

The Site investigation observations and interviews with the Maintenance staff, Electrical department in charge are summarized below:

- The **switch-off drills are practiced at present**, the maintenance staff and Lab Attendants put off switches of all equipment's regularly.
- All the **computers are shut-off after use** and also put on power saving mode.
- There are **display boards encouraging staff and students to save energy are put up in the classrooms and laboratories.**
- Ultra violet lights are used only in the scientific laboratory for a certain amount of time. Apart from this space no other space has the usage of any harmful lights.

Actual Electrical Consumption as per Bills

The admin department had shared the bills for Meter which is connected to the Building and is the main source of energy supply. The details of unit consumption meter wise stated there were around 93789 units consumed for Rs. 1252422/-

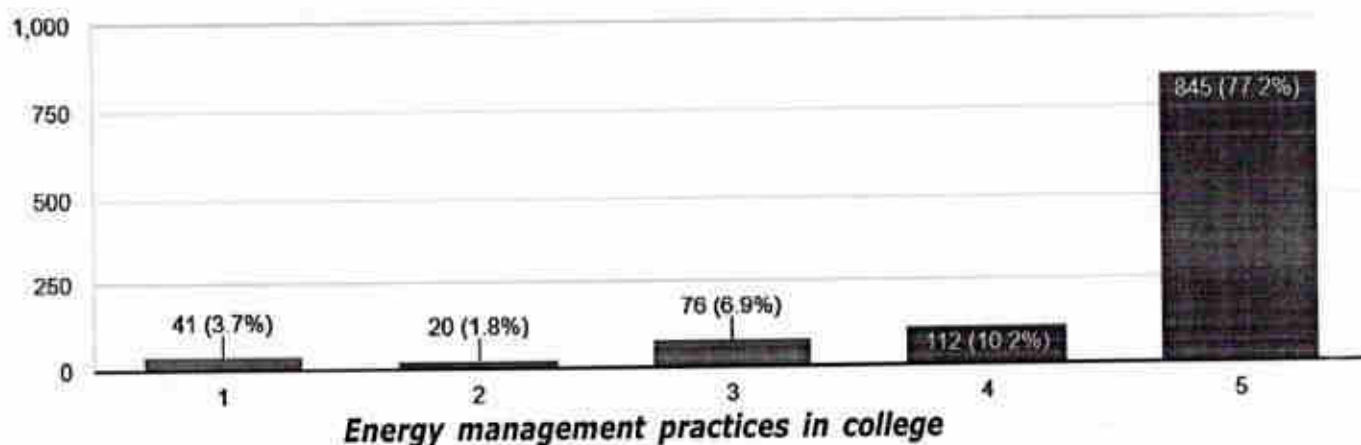
In a table - Electrical information - Column heading should be S. No. Month year - Units consumed - Amount (For all the Academic years)

S. No.	Month	Year	Units consumed	Amount	Amount (For all the Academic years)
1.	July	2021	23202	360109	733668
2.	August	2021			
3.	September	2021			
4.	October	2021			
5.	November	2021			
6.	December	2021	4080	63430	
7.	January	2022	7060	89399	
8.	February	2022	3964	42214	
9.	March	2022	4278	44865	
10.	April	2022	6239	70888	
11.	May	2022			
12.	June	2022	6428	62763	
13.	July	2022	4905	87750	518754
14.	August	2022			
15.	September	2022	4490	108796	
16.	October	2022	4628	48382	
17.	November	2022			
18.	December	2022	2787	32334	
19.	January	2023	2008	25711	
20.	February	2023	2831	31883	
21.	March	2023	3933	42692	
22.	April	2023	4308	47214	

23.	May	2023	5606	60639	
24.	June	2023	3042	33353	
25.	Total		93789	1252422	1252422

Table : Details of the electrical consumption

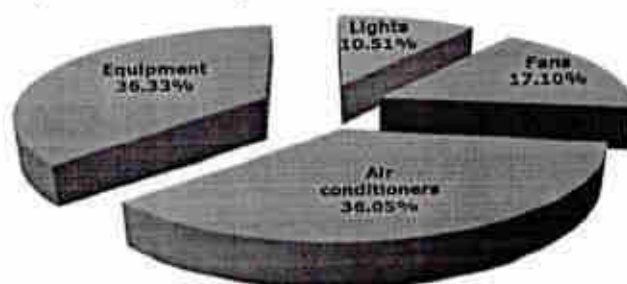
The summary of the above study shows the average consumption varies for each month.



The students, staff (**almost 77%**) of the responses found the practices to be **excellent (rating 5)** and **10%** of the responses found practices to be very good (**rating 4**).

Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff. The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise is summarized in the following sections. Note: The following analysis is combined for entire premise taking into considerations the duration before pandemic to understand the consumption pattern as post pandemic the premise is used only for a few hours.



Summary of the calculated electrical consumption as per inventory

The above graph shows that equipment consumes 36.33%; air conditioners consume

36.05% while the fans consume 17.10% and the lights consume 10.51% of the total calculated electrical energy.

Lights

Types of lights based on the numbers

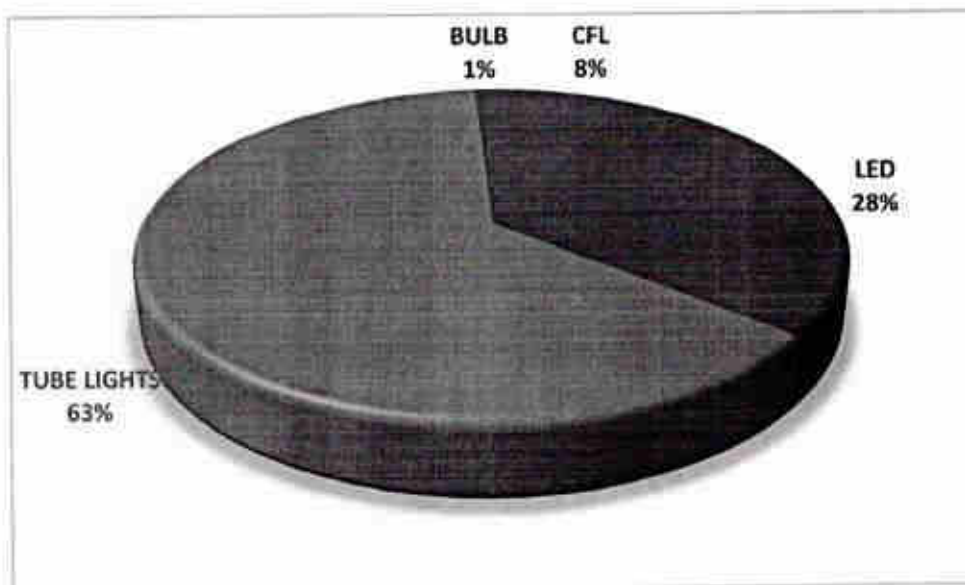
There are a total of **222 lights in the premises**; the following table shows the various types of lights in the premises.

S. No.	Type	Nos.
1	CFL	17
2	LED	63
3	TUBE LIGHTS	140
4	BULB	02
	TOTAL	222

Summary of the types of lights in the premise

Types of lights based on the power consumption

The following graph shows the type of lights.



Energy consumed by types of lights in the premise based on the usage study

The analysis of the types of Lights in premises shows **LED lights consume 28%**; whereas the **CFL lights consume 8%**; the **BULBS consume 1%**; and the **TUBE lights consume 63%**.

Requirement of NAAC

Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources – There are solar panels available in the premises. The College utilizes the power generated solar system.

Site investigation observations

1. All lights are in working conditions
2. Daily monitoring and check is done by the maintenance staff.
3. There was no fuse defect observed.

Fans

Types of fans based on the numbers

There are a total of **55 fans of different types** in the premises.

Air conditioners

Types of air conditioners based on the numbers

There are **04 air conditioners** on the entire premises.

Site investigation observations

1. Daily monitoring and check are done by the maintenance staff skilfully.
2. The Outdoor units were properly cleaned, maintained and had no dust collection problems.

Equipment

Types of Equipment

There are **63 types of equipment totaling to 115** in the premises as follows:

Sr. No.	App.	Quantity	Consumption	Total Consumption Watt.
1	Sonometer	3	12 W each	36
2	Melde's	2	12 W each	36
3	Bending of Beam	3	05 W each	15
4	Characteristics of Zener Diode	5	12 W each	60
5	To Verify Stefan's Law by Electrical Method	3	12 W each	36
6	To Study Charging & Discharging of a Capacitor	3	12 W each	36
7	Characteristics of Junction Diode	6	12 W each	72
8	Photo Diode	3	12 W each	36
9	Energy Band Gap	3	100 W each	300
10	Galvanometer to Ammeter	2	12 W each	24
11	Galvanometer to Voltmeter	2	12 W each	24

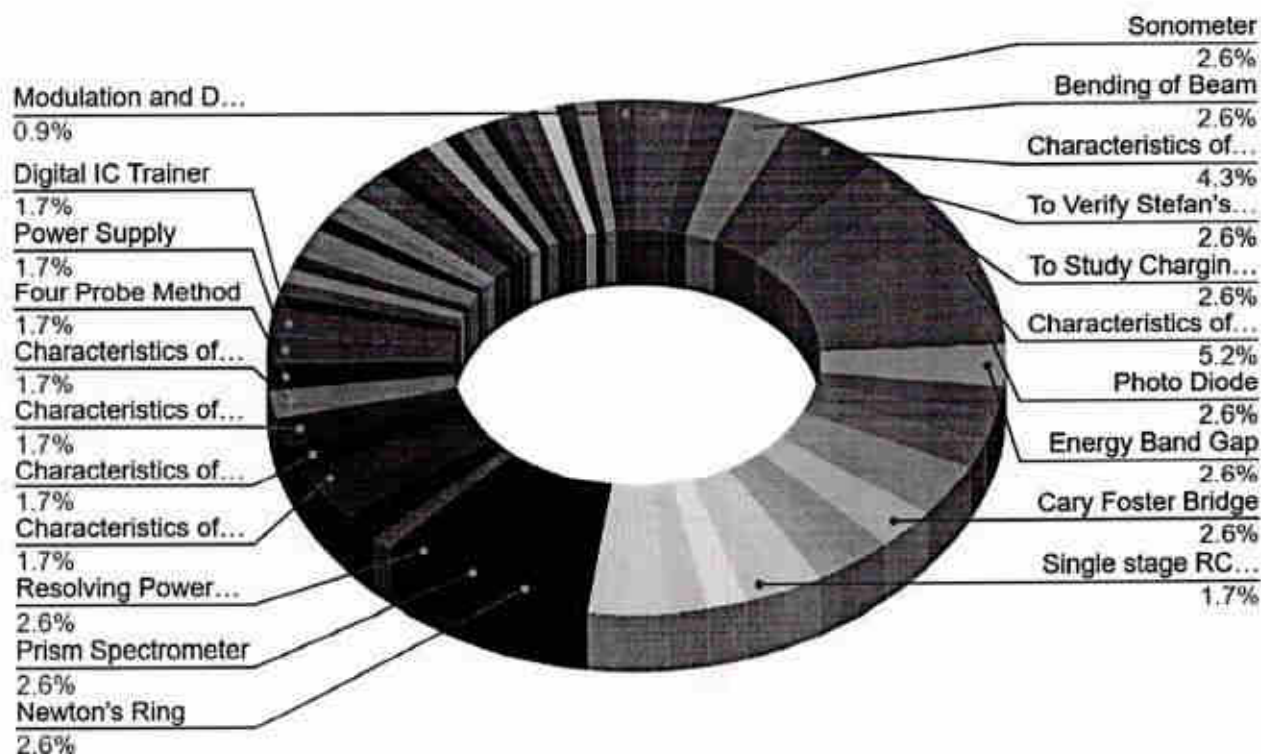
12	Circular Coil	2	12 W each	24
13	De-Sauty Bridge	2	12 W each	24
14	L.C.R. Circuit	2	12 W each	24
15	Cary Foster Bridge	3	12 W each	36
16	P.O. Box	2	12 W each	24
17	Anderson Bridge	1	12 W each	12
18	Maxwell Bridge	1	12 W each	12
19	To Study the Transformer Coupled Amplifier	2	12 W each	24
20	Single stage RC Coupled (CE) Amplifier	2	12 W each	24
21	Plank's Constant	2	12 W each	24
22	R.C. Coupled (CB) Amplifier	2	12 W each	24
23	CE-NPN Characteristics	2	12 W each	24
24	CB-PNP Characteristics	2	12 W each	24
25	Nodal Slide	2	9 W each	18
26	Newton's Ring	3	35 W Shared	35
27	Prism Spectrometer	3	9 W Shared	9
28	Resolving Power of telescope	3	05 W each	15
29	Polarimeter Half Shade	1	35 W each	44
30	Polarimeter bi-quartz	2	9 W each	
31	Laser	2	02 W each	4
32	Characteristics of field effect transformer (FET)	2	12 W each	24
33	Characteristics of silicon-controlled rectifier (SCR)	2	12 W each	24
34	Characteristics of N&P Channel MOSFET	2	12 W each	24
35	Characteristics of UJT	2	12 W each	24
36	Four Probe Method	2	500 W each	1000
37	Power Supply	2	12 W each	24
38	Digital IC Trainer	2	12 W each	24 Watt
39	Byprism	1	35 W each	35 Watt
40	Babinet Compensator	1	35 W each	35 Watt
41	Brewster Law	1	9 W each	9 Watt
42	Michelson Interferometer	1	2 W each	2 Watt
43	Cauchy Theorem	1	9 W each	9 Watt
44	Etalon	1	35 W each	35 Watt
45	Series and parallel LCR circuit	1	12 W each	12 Watt
46	Low, High and Band pass circuit	1	12 W each	12 Watt
47	AC Bridges	1	12 W each	12 Watt
48	Characteristics of silicon-controlled rectifier (SCR)	1	12 W each	12 Watt
49	Characteristics of N&P Channel MOSFET	1	12 W each	12 Watt

50	Characteristics of UJT	1	12 W each	12 Watt
51	Four Probe Method	1	500 W each	500 Watt
52	Hartley Oscillator	1	12 W each	12 Watt
53	Multivibrator using 555	1	12 W each	12 Watt
54	Op-Amp Circuits	1	12 W each	12 Watt
55	Wein Bridge	1	12 W each	12 Watt
56	Phase Shift Bridge	1	12 W each	12 Watt
57	A/D and D/A Converter	1	12 W each	12 Watt
58	Digital IC circuit trainer (Bread Board Model)	1	12 W each	12 Watt
59	Study of Random Access Memory (RAM)	1	12 W each	12 Watt
60	16 to 1 Multiplexer	1	12 W each	12 Watt
61	1 to 16 Demultiplexer	1	12 W each	12 Watt
62	8085 Microprocessor	1	12 W each	12 Watt
63	Modulation and Demodulation	1	12 W each	12 Watt

Types of equipment in the premise as per the quantity

Types of equipment based on the power consumption

The energy consumption of equipment is **2220 kWh** of energy; the following graph shows the detailed consumption.



Summary of Energy consumed by equipment in the premises

Site investigation observations

1. All equipments are in working conditions and daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.
2. No defect was found in any equipment of electrical consumption.

Recommendations for a Sustainable Habitat

Over the time energy efficient appliances have been a boon not only to the energy saving parameters they adhere to but also the eco-friendly habits it helps to inculcate. The Institution such as Schools and Colleges are the best way to implement these initiatives. It creates awareness among the students at a young age. The Institutions also act as a symbol and representative of being an energy efficient premise. Following the analysis we found are some of the suggestions which can be implemented for an energy efficient Institution. **This would help in reduction of the current electrical consumption by a major percentage.**

Section 1 Building management systems

The College has extreme potential to become 100% energy-efficient premises. In addition to provisions in the electromechanical system, some facilities can be introduced towards building management systems as well. These can be undertaken equally for educational and residential sections.

- **Set the BMS time of day schedules** - To suit the minimum occupancy periods of the areas served and implement optimum start-stop incorporating a night purge cycle, session, and holiday schedule.
- **Space temperature Setback** - A temperature setback is a simple strategy to help save utility costs by reducing how often your heating or cooling system operates.
- **Timer control of air conditioners.**
- **Timer control of personal heaters** - Install push button timer control of personal heaters in Residential areas.

Section 2 - Electromechanical systems - Electrical and Lighting Sub-

Section 1 - Lights

Non-LED lights

The current light analysis shows that there are lights such as Non-LED lights, CFL, lights in the premises. Our technical analysis shows that there would be a reduction of an

average of **50% reduction** in energy consumption through lights. specifically as a part of the electro -mechanical system if all **Non-LED lights, CFL, Halogen, Mercury lights on all floors** are replaced with an energy efficient appliance whenever the College undergoes renovation.

Sub-Section 2 - Fans

Ceiling fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 45W when in use. These should be replaced with energy efficient fans consuming 14W when in use. Our detailed study states that is all the **ceiling fans on all floors** if replaced with star rated appliance results in a reduction of average of **69% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if college can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

Sub-Section 3 - Equipment

Desktop computers to laptops

Among all equipment it suggested to replace the desktop computers with laptops as this would be energy efficient. A normal desktop computer consumes on an average 250W and it is to be connected all time when it has to be used. On the contrary a laptop consumes 40W and has a battery backup which lasts up to 4 hours. There is an **average 84% reduction** in energy consumption if replaced with energy efficient appliance which is a laptop in all the areas of Educational areas.

This replacement is however is dependent on a variety of factors as follows.

- Some of the senior staff members may be more convenient with computers, replacement with laptop might result in a change of the working patterns and hours which may affect the productivity.
- Laptops – in case are not handled with care such as if dropped unintentionally might result in data imbalance.
- Students who are not day scholars can use laptop as per their own convenience, whereas in common areas there can a monitoring about the usage

- Similarly depending on the pandemic situation in case it might be possible due to irregular usage the device might have issues while functioning.

Thus the College should analyse the above points and then devise a strategy about the replacement, essentially when the devices get damaged or are not in working condition they can surely be replaced.

As well as once they are not in working condition the proposed strategy should be linked towards e-waste management as well.

Section 4 - Solarisation

Zero energy and Net positive energy buildings

Zero energy buildings combine energy efficiency and renewable energy generation to consume only as much energy as can be produced onsite through renewable resources over a specified period.)

