

GREEN AUDIT REPORT

JUNE - 2020



PES INSTITUTE OF ADVANCED MANAGEMENT STUDIES

Affiliated to Kuvempu University & Recognized by Govt. of Karnataka

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Green Audit Report of PES Institute of Advanced Management Studies (PESIAMS) has been prepared by Dr. Nandan N Shenoy based on visit to the college campus, checking records and interactions with faculty, non-teaching staff and students. The audit was conducted on 8th and 9th of June 2020.

The Green Audit Report also presents green initiatives followed and taken up by the institution, and provides suggestions and recommendations to improve environmental sustainability.

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1. Introduction

PES Institute of Advanced Management Studies (PESIAMS), run by Prerana Educational & Social Trust (R) is located in Shivamogga, Karnataka and is established in the year 2008. It is affiliated to Kuvempu University, Shankarghatta, Shivamogga and recognized by Government of Karnataka. PES Trust was established in the year 2007 and at present has 6 institutions.

PESIAMS has grown from strength to strength within a very short span of time, and is currently offering different courses in Commerce, Management and Computer Science. The institution has already earned a strong reputation amongst the leading employers as a nodal centre for recruitments in Malnad region.

PESIAMS has 713 students' enrolled and 39 teaching & non-teaching staff on its payroll.

PESIAMS offers various courses listed below:

Postgraduate Course:

Masters of Commerce (M.Com)

Undergraduate Courses

Bachelor of Business Administration (BBA)

Bachelor of Computer Applications (BCA)

Bachelor of Commerce (B.Com)

Bachelor of Science (B.Sc)

Green Audit enables the institution to:

- Enhance awareness levels on environment management and sustainability.
- Prepare environment management plan and promote sustainability through efficient resource management resulting in cost reduction.
- Benchmarking process in terms of resource utilization.
- Identify gaps and suggest recommendations to improve the Green Campus status of the institution.

The audit was performed according to the Green Quotient. Prior to audit questionnaire and checklists were prepared, based on which the audit is conducted. During the audit, the team visited entire PESIAMS campus i.e. classrooms, library, washrooms, staff rooms, HOD Chamber, Principal chamber, computer & physics laboratories, hostels, hostel kitchens, garden etc. Audit procedure also involved interactions with stakeholders i.e. faculty, staff members, students, supportive staff etc.

Green Audit Report addresses green initiatives taken/under implementation by management, the outreach of institution, suggestions & recommendations to improve overall environmental sustainability of the campus.

Institution Information

PES Institute of Advanced Management Studies consists of college building, 4 hostels (2 Boys hostels and 2 Girls hostels), 1 staff quarters, 2 cafeterias, 1 KSCA recognized Cricket ground, 1 Football ground, 2 Tennis Court, 1 Basketball court.

Academic Block

Floor	Facilities
Ground Floor	Principal's chamber, HOD chamber, Reception, waiting launch Accounts & Admission section, 4 Classrooms, 3 Ladies wash rooms, 2 Gents wash rooms, 3 Faculty cabins, Seminar hall, Browsing Centre, Strong Room, Girls Waiting Room, Power Room.
First Floor	HOD chamber, Server Room, 7 Classrooms, 5 Faculty cabins, 2 Ladies wash rooms, Library, Computer Science lab.
Second Floor	HOD chamber, 7 classrooms, 2 staff rooms, UPS Room, Physics Lab, Store Room, Dark Room.
Third Floor	RO System.

Boys Hostel- A Block

Floor	Facilities
Ground Floor	1 Store Room, 1 Warden Room with attached Bath Room, 14 Rooms with attached bathroom
First Floor to Third Floor	1 Store Room, 1 Guest Room with attached Bath Room, 14 Rooms with attached bathroom.

Boys Hostel- B Block

Floor	Facilities
Ground Floor	1 Store Room, 1 Warden Room with attached Bath Room, 18 Rooms, 12 Bath Rooms, 12 Toilets
First Floor to Third Floor	1 Store Room, 1 Guest Room with attached Bath Room, 18 Rooms, 12 Bath Rooms, 12 Toilets

Girls Hostel- A Block

Floor	Facilities
Ground Floor	1 Office Room, 1 Warden Room, 14 Rooms, 1 Dining Hall, 8 Bathrooms, 8 Toilets.
First Floor to Third Floor	1 guestroom with attached bathroom, 23 Rooms, 8 Bathrooms, 8 Toilets.

Girls Hostel- B Block

Floor	Facilities
Ground Floor	Office Room, Warden Room with attached Bathroom, 6 Rooms, 1 Dining hall, 3 Bathrooms, 3 Toilets,
First Floor to Third Floor	14 Rooms, 5 Bathrooms, 6 Toilets

Staff Quarters

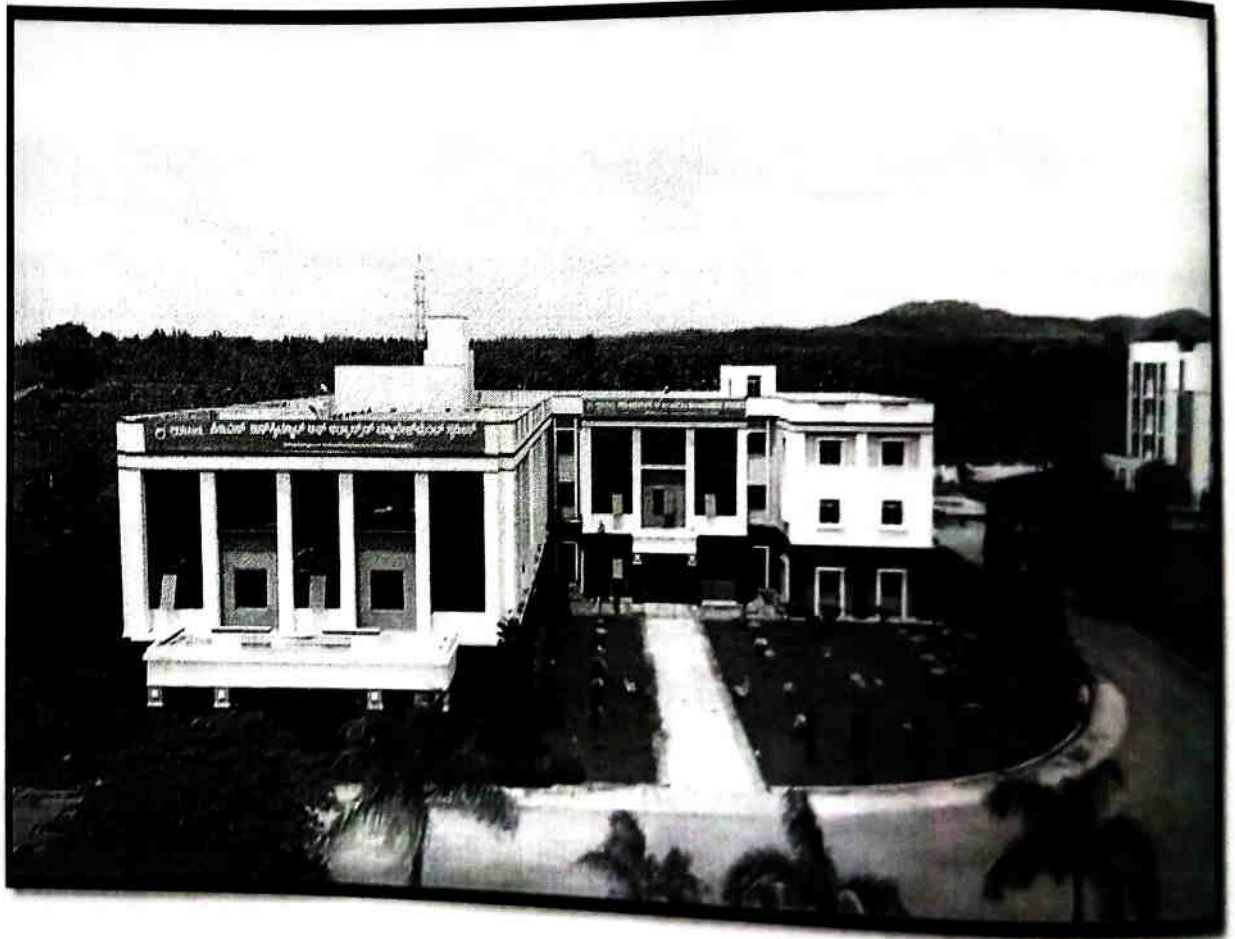
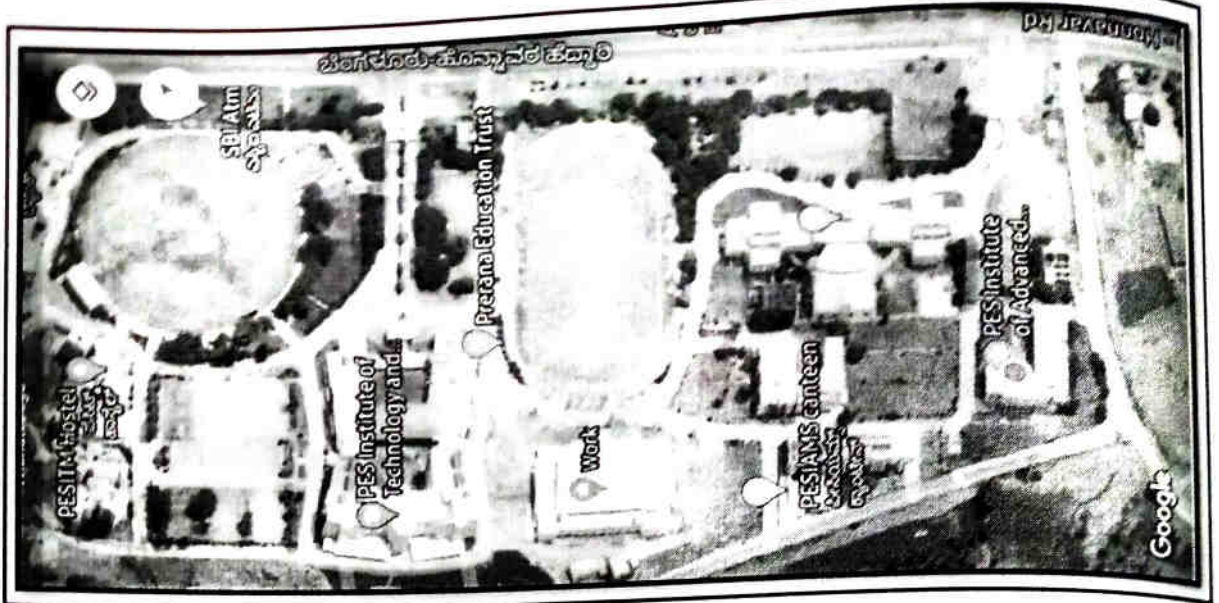
Floor	Facilities
Ground Floor	5 2BHK houses (1 attached bathroom), 1 1BHK house, 1 guestroom with attached bathroom,
First Floor to Third Floor	6 2BHK houses (1 attached bathroom)

During Audit, team interacted with following stakeholders:

Name	Designation, Department
Dr. Nagaraja R	CCA, PES Trust
Dr. Nagaraja S R	Coordinator, P G Dept. of Commerce
Dr. Sudharshan G M	HOD, Dept. of Commerce & Management
Mrs. Roopa D S	HOD, Dept. of Computer Science
Mr. Mohan D	Assistant Professor, Dept. of Commerce & Management
Mrs. Ashwini E M	Assistant Professor, Dept. of Computer Science
Dr. Hiremath M. N.	Professor and Head, Civil Engineering Dept, Chief Warden, Boys Hostel
Prof. Yagnodhbhavi H.M	Asst. Professor, Civil Engineering Dept, Chief Warden, Girls Hostel
Dr. Sendhil G	Physical Director, PESIAMS
Mr. Prasad S V	Senior Librarian, PESIAMS
Mr. Anil Kumar U	Site Engineer, PES Trust
Mrs. Shridevi	Warden, Girls Hostel
Mr. Thippesh G M	Warden, Boys Hostel
Mr. Girish H	Electrical Engineering, PES Trust
Mr. K Manikya	Garden Supervisor, PES Trust
Ms. Samantha P R	Student, P G Dept. of Commerce (M.Com)
Mr. Rohan B Y	Student, Dept. of Commerce & Management (BBA)
Ms. Niharika B Y	Student, Dept. of Commerce & Management (B.Com)
Ms. Priyanka S M	Student, Dept. of Computer Science (BCA)
Ms. Yashaswini S	Student, Dept. of Computer Science (B.Sc)

2. Environmental Setting

PES Institute of Advanced Management Studies, Shivamogga Founded in 2008 under the guidelines of visionary leader Sri B S Yadiyurappaji, to provide world class education to the students community of Malnad region. Campus is spread over an area of 1 acre 13 guntas and situated on NH -206. PESIAMS campus comprises lush green vegetation along with world class infrastructure and international standards Gym, Football, Cricket, Basketball and Tennis courts.



PES Institute of Advanced Management Studies Campus

3. Green Audit

For Green Audit following 14 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified / validated.

- 3.1 Good Daylight Design and Ventilation
- 3.2 Water Efficiency
- 3.3 Wastewater Management
- 3.4 Indoor Air Quality
- 3.5 Energy Efficiency
- 3.6 On-site Energy Generation
- 3.7 Temperature and Acoustic Control
- 3.8 Paper Waste Management
- 3.9 E-Waste Management
- 3.10 Solid Waste Management
- 3.11 Universal Access and Efficient Operation and Maintenance of Building
- 3.12 Transportation
- 3.13 Green Belt
- 3.14 Green Programs (Green initiatives)

3.1 Good Daylight Design and Ventilation

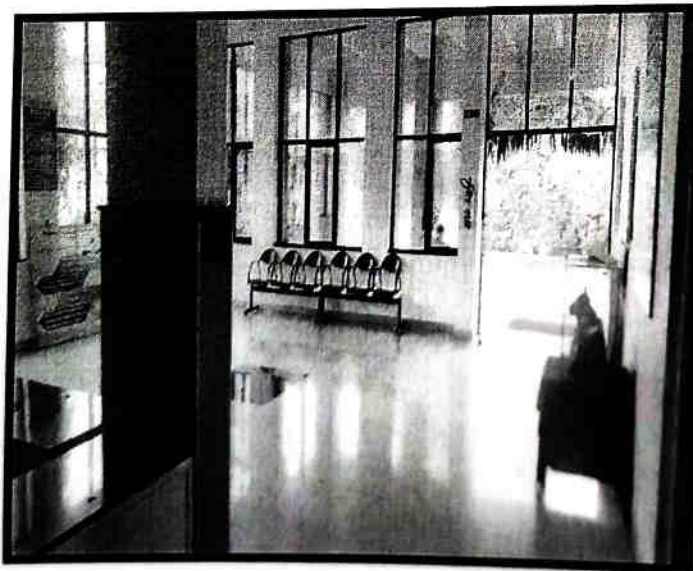
Observations:

- a) Corridors are 2.4 m wide with ceiling height ranging from 3.25 to 3.65 m.
- b) Classrooms, laboratories, library and kitchens have high ceiling with wide doors and large windows. Windows are kept open for adequate daylight.
- c) Academic blocks are designed in such a way that corridors and classrooms receive ample sunlight. Sunlight near reception area was about 60Lux in morning.
- d) Curtains are provided on majority of the windows to avoid glare.

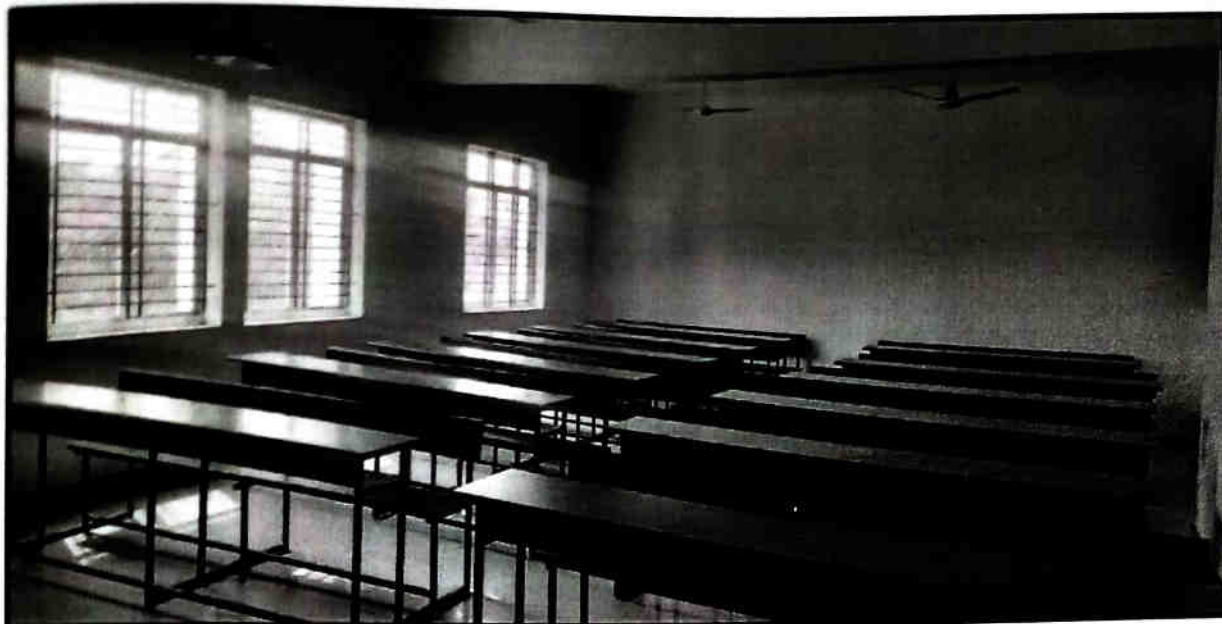
Main College Entrance



Wide Corridor- Main Entrance



Class Rooms with Adequate Sunlight



3.2 Water Efficiency

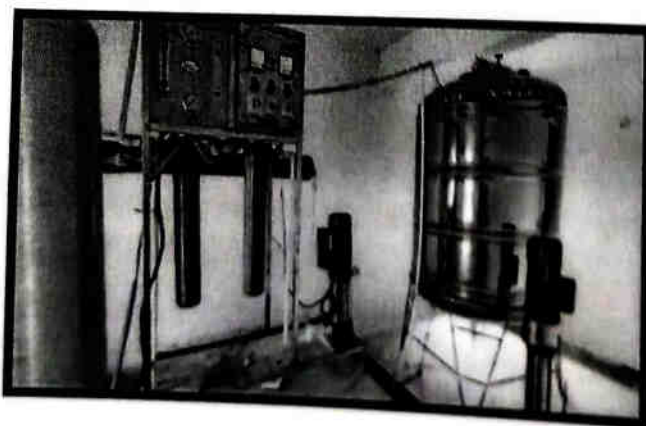
Observations:

a) PESIAMS draws water from 9 borewells which are situated within the campus. The campus has 2 corporation water connections and one open well of volume 600KL. Water meters are not provided to monitor the water withdrawal from borewells whereas water meters are provided for corporation water connection. As per the data provided by PESIAMS maintenance supervisor, total daily water consumption for entire institution is 135 KLD. Water consumption by academic blocks is 20 KLD and 115 KLD by hostels.

b) Water from borewell and corporation connections is stored in underground and overhead storage tanks.

Water Storage Tank Location	Quantity	Capacity
Under Ground	1	1.25 KL
Over Head for Academic Block	1	25KL [(1 x 25KL)]
Over Head for Hostels	8	190KL [50KL+30KL+ (2 x 30KL)+(2 x 25 KL)]
Total	14	820

- c) From underground storage tank, water is transferred to overhead tanks using 5HP motor pumps and through overhead tanks water is distributed to washrooms, washbasins, laboratories, canteens and also to water purifiers installed for supplying drinking water. Water purifiers are based on Reverse Osmosis Technology (RO).
- d) Restrooms and kitchens are water intensive areas.
- e) Around 200 KLD of water which is generated from STP is being used daily for gardening
- f) Dry and wet mopping is practiced for floor cleaning. Floors are mopped once in a day.
- g) Water conservation faucets were seen in all washrooms.
- h) Dual flushing system is provided in all the washrooms.
- i) If water leakage is observed, it is immediately attended by PESIAMS maintenance department.
- j) Records of such leakage complaints should be maintained to quantify water saved.
- k) Signages on water conservation are not present in hostel washrooms and dining room areas.
- l) PES Trust (R) is planning to install rainwater harvesting system and construct borewell recharge pits in the campus. Feasibility report is already prepared by civil engineering department.



RO System



Water Storage Unit

3.3 Wastewater Management

Observations:

a) Wastewater is mainly generated from toilet flushing and kitchens. Details of washrooms are as follows,

Building	Facility
Academic block	29 Wash rooms
Boys Hostel- A Block	75 Bathrooms, 75 Toilets
Boys Hostel- B Block	65 Bathrooms, 65 Toilets
Girls Hostel- A Block	35 Bathrooms, 35 Toilets
Girls Hostel- B Block	24 Bathrooms, 37 Toilets
Staff Quarters	48 Bathrooms, 48 Toilets

b) Sewage which is generated from the academic block as well as hostel block is conveyed through the underground sewers to the Sewage Treatment Plant of capacity **200 KLD** which is situated within the campus.

3.4 Indoor Air Quality

Indoor Air Quality (IAQ) refers to the air quality within & around buildings and structures, it relates to the health and comfort of building occupants. Common indoor pollutants are listed as below:

Carbon dioxide – Due to human respiration

Carbon monoxide – Sources of carbon monoxide are combustion of fossil fuels

Volatile organic compounds (VOCs) – VOCs are emitted by paints and Varnishes, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.

Particulate matter – Due to construction and maintenance activities, vehicular pollution

Observations:

a) During day- time Air Quality Index (AQI) of Shivamogga which is 8 km from PESIAMS is in the range of 30-38

(<https://www.iqair.com/india/karnataka/shimoga>)

b) In kitchens present in canteens, LPG is used for cooking which is a clean fuel

- c) In classrooms the mode of ventilation is natural draft (through windows) and is enhanced by fans. Large windows and cross-ventilation are observed in corridors.
- d) Green belts have been set up in PESIAMS.

3.5 Energy Efficiency

Electricity:

Electricity is provided by Mangalore Electricity Supply Company Limited. Common electricity meter is provided for entire campus. Electrical bills from September 2019 to September 2020 of the entire campus were available for review. The monthly average electricity consumption by the entire campus is as indicated below

Month	Electricity Consumption (Units)
September 2019	4079
October 2019	3914
November 2019	4704
December 2019	4123
January 2020	3659
February 2020	3616
March 2020	3223
April 2020	1529
May 2020	2008
June 2020	1888
July 2020	1796
August 2020	1900
September 2020	1802

The energy consumption was maximum in November 2019 followed by December 2019. The areas of major consumption of electricity in the month of February are as follows:

Electrical Equipments	Units
Tube Lights & LEDs	190
Fans	151
Computers	104
Printers	5
Projectors	13
Sharp Xerox	2

- a. Conventional tube lights, LEDs & fans are installed in classrooms, laboratories and kitchens. For efficient energy consumption and saving on electricity bill, PESIAMS has initiated the process of replacing tube lights with LEDs.
- b. Uninterruptible Power Supply (UPS) system is present in computer laboratories for computers and server. UPS system is typically used to protect hardware i.e computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause serious data loss or business disruption. PL
- c. All the computers have LED screens; Computers are shut down with turning main switch off when not in use.
- d. Separate switches are provided for tube-lights and fans. So it is possible to switch on a specific light or a fan and to avoid wastage of energy due to common area illumination.
- e. Tube-lights and fans are switched off by students and staff when not in use. However, signage was not seen near electrical switch boards. Signage can encourage users to switch off light and fans to save electricity.
- f. Power cut-off is being carried out daily from 10 am to 12:30 pm and 2 pm to 4:00 pm in all hostels when students are present in classes to save electricity.

3.6 On Site Energy Generation (Usage of LPG/ Natural Gas):

Observations:

- a. LPG cylinders are used in all kitchens for cooking. Around 5- 7 cylinders are required daily. 2 cylinders are required in each PESIAMS cafeteria and 3-5 cylinders are required for hostels. 1 cylinder of 19 kg will generate 881.6 MJ (Mega Joules) of energy; hence total energy generation will be 4408 – 6171.2 MJ/ day.
- b. Storage facility for LPG cylinder is located on ground floor adjacent to the cafeteria. All the commercial LPG gas cylinders were in erect position.
- c. Cylinders must be prevented from falling, movement or physical damage by storing them in approved cages/racks, securing the cylinders with safety chains or using other approved retention methods for LPG gas cylinder safety.
- d. PESIAMS has two diesel generators (DG) of capacities 320KVA and 500KVA respectively for hostels and Academic Blocks respectively. DG emissions are well monitored. The noise levels are well within permissible limits of 75 dB (A) leq during day and 70dB (A) leq during night.
- e. Four Solarizers (Solar water heaters) of capacity 1 KL are present in boys hostels 'A' block. Two Solarizers of capacity 2 KL are present in boys hostels 'B' Block. Two Solarizers of capacity 2 KL are present in girls hostels 'A' block for water heating purpose. Solarizers are installed by 'ORB Solar Systems' in the year 2009.
- f. PESIAMS has installed 4 numbers of solar street lights of capacity 18 watts light fixtures with 42 AH battery with 15 m poles in the campus during June 2020.
- g. PESIAMS is planning to install Solar PV System of capacity 360KW for energy generation.



Cylinder Storage area adjacent to cafeteria



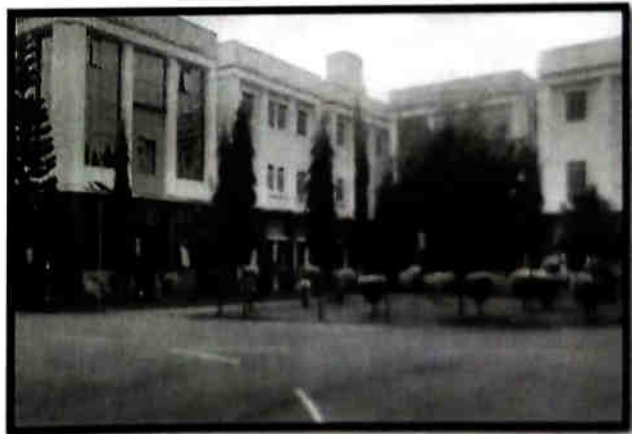
**DG of capacities 320KVA and 500KVA
KSPCB norms**

DG sets provided with stack as per

3.7 Temperature and Acoustic Control

Observations:

- a) Even though PESIAMS is located on the side of national highway, NH 206, the vehicular noise pollution was found minimum in the premises.
- b) Trees are planted in the PESIAMS campus which helps as a buffer in reducing noise level, maintaining temperatures of the area.



Green Belt in PESIAMS campus

3.8 Paper Waste Management

Being academic institution, waste paper is one of the main solid waste generated in the premises. PESIAMS has taken steps to minimize the wastage and avoid paper usage.

Observations:

- a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digital scanning is practiced.
- b) PESIAMS library has an area of 590 Sqm and with a seating capacity of 100. It has a total of **5496 books and 850 titles available**. Journals, magazines, newspapers are also available in the library
- c) PESIAMS library started its digital library in 2011 where books and journals are available online. Our institution is subscribed e-ShodhaSindhu (N-List), a institution component e-Shodha Sindhu consortium with access to 6,000+ Journals, 1, 64,300+ e-books under NLIST 6, 00,000 e-books through NDL. 7 computers are present in the library to access online services.
- d) Records of books and e-books are well kept and were available for review. PESIAMS renews the existing subscription or subscribe to new books every year by analyzing the usage of last year.
- e) Internal communications are done through E-mail/Whatsapp.
- f) Biometric attendance is provided for PESIAMS staff.
- g) Around 100-200 kg paper waste is being generated by PESIAMS each year. Old papers and note books are given to the recycler Bharath Scrap Merchant, Ashoka Nagara, Shivamogga
- h) PESIAMS encourages students to use eco-friendly material and recycle old papers/ scrap for decoration purpose during college festivals.



Library



Digital Library

3.9 E-Waste Management

Observations:

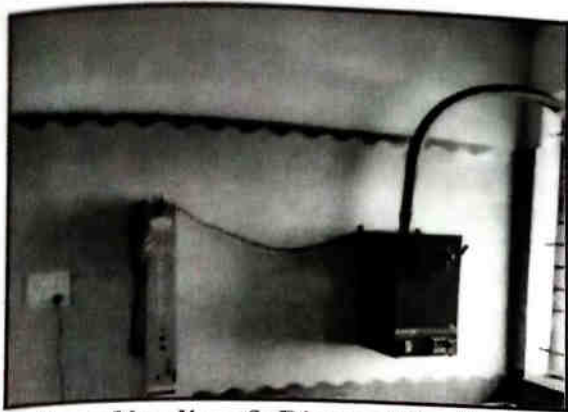
- a) PESIAMS is digitized to a much extent. This includes classrooms, library, internal mails etc. Most of the classrooms are digitized.
- b) PESIAMS has Digital library, student & staff portal for academic work, biometric attendance system for staff, etc.
- c) PESIAMS has 93 Computers, 5 Printers, 2 Photo Copiers, 13 Projectors in working condition.
- d) An internal MOU for E waste Management has been done with PESITM in turn PESITM entered into MOU with 'Sogo Synergy Pvt. Ltd. (PCB/WMC/2864/E Waste/2018-2019) on 10th January 2020.

3.10 Solid Waste Management

Being an institute with residential facility, considerable quantity of wet (food / organic) waste is generated in the premises.

Observations:

- a) Daily around 275-300 kg wet waste and 10-20 kg dry waste is generated in PESIAMS campus.
- b) Biodegradable wet waste is mostly generated from kitchens. Food waste generated in kitchens is sent to pig farm where it is processed and used as food for pigs.
- c) In other areas like classrooms, mostly paper waste and plastic wrappers are generated.
- d) Dustbins are provided in each class room, in staff rooms, laboratories, washrooms, cafeteria and kitchens in campus area.
- e) Segregation of wet and dry waste is not practiced in the campus except in kitchen areas.
- f) Signage's for creating awareness on minimizing food wastage were seen in two hostel dining room areas. There is no signage for promoting segregation of wet and dry waste.
- g) Sanitary napkin vending machine and disposal facility (Incinerator) has been installed in ladies hostel during June 2018. This is provided by "Nature Care Solutions", Bangalore.



Sanitary Vending & Disposal Facility



Dustbin

3.11 Universal Access and Efficient Operation and Maintenance of Building

Observations:

- a) PESIAMS is easily accessible from National Highway (NH 206). Handrails were seen for all staircases.
- b) Staircases and classrooms have wide windows, which can allow safe evacuation during emergency.
- c) Fire hydrant and fire alarm systems are installed by 'Premiere fire and safety' Mangalore, in February 2018 in the academic block. PESIAMS is in process of receiving a Compliance Certificate for the same. Fire hydrant and alarm system will be commissioned after receiving the Compliance Certificate
- d) Fire Extinguishers are installed by 'Premiere fire and safety works' in the year 2012.
- e) 'Premiere fire and safety' is a service provider for maintaining fire extinguishers. Fire extinguishers are provided on all floors in academic blocks as well as hostels. There are total 25 fire extinguishers in academic block. Each hostel floor has one fire extinguisher. Fire extinguishers are provided in all kitchens.
- f) Fire extinguishers provided in hostels had expired. These need to be serviced or replaced. Fire extinguishers present in academic blocks are serviced and within expiry limit.
- g) There are signages for emergency fire exit which is crucial during emergency.
- h) Fire safety trainings and mock drill was performed in the campus on 20th December 2016 by Karnataka state fire & Emergency services Department, Shivamogga.
- i) First aid boxes is maintained at administration office and all hostel buildings. All the items in the boxes were within the expiry limit.



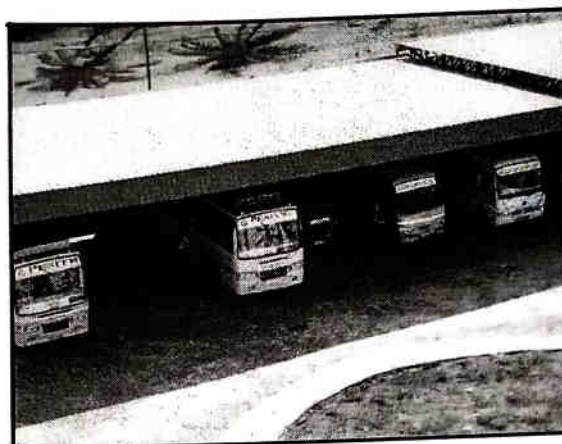
Fire Safety Training Program



3.12 Transportation

a) PESIAMS is located at a distance of 8 kms from Main bus stand. PESIAMS has 2 buses. It provides buses for transportation of students/ staff. Most of the staff pool cars and a few staff members travel by private vehicles.

b) Management encourages students and staff to use the college buses or public transport system to reduce carbon emissions.



Transportation facility at PESAMS

3.13 Landscaping

Observations:

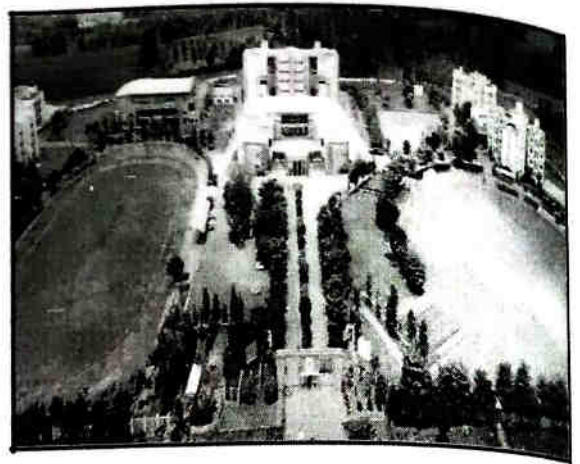
a) PESIAMS campus has landscape of 7343 square meter area, which has around 10 creepers and 30 plants. Sprinkler system is provided in campus.

b) Large trees and potted plants were seen in the campus. Plantation improves aesthetics and helps as buffer in reducing noise level, maintaining temperatures of the area. As informed by the garden supervisor, around 55 trees are present in the campus.

c) Large trees include Palmyra palm (*Borassus flabellifer*), Ashoka (*Saraca asoca*), Rain Tree (*Samanea saman*), Coconut (*Cocos nucifera*), Badami, postal palm, Areca nut (*Areca catechu*), Arjuna (*Terminalia arjuna*) etc. Shrubs include Red hibiscus (*Hibiscus rosa-sinensis*), White hibiscus (*Hibiscus waimeae*), Bush morning glory (*Ipomoea carnea*), Purple allamanda (*Allamanda blanchetii*), Star jasmine (*Trachelospermum jasminoides*), Jungle geranium (*Ixora coccinea*), Firebrush (*Hamelia patens*), Chinese violet (*Asystasia gangetica*) etc.

d) Garden is managed by 10 staff members. Organic fertilizers and pesticides are used for plants if necessary.

Landscaping in PESIAMS campus



3.14 Green Initiatives

Due to minimum consideration for environment & sustainability, the world is facing problems of ozone depletion, climate change, water scarcity and sustainable resource management.

PESIAMS makes a point to account for sustainable living while designing and operating our buildings. Many of the facilities incorporate natural lighting, improve air quality, and reduce energy and water use. The NSS wing of the college has been conducting many programs to educate the students' community of the college and the general public about the relevance of green environment.

Green initiatives by PESIAMS (2016-2020) is depicted in Annexure –I

4. Green Steps taken by PESIAMS

PESIAMS campus was audited with respect to Green Audit Checklist prepared by Auditing team (refer **Annexure 2**).

Based on the data available for review, it was understood that, since from its inception PESIAMS, is actively taking initiatives in environment friendly activities. PESIAMS has taken green steps by installing renewable energy system, reducing paper use in academic activities, e-waste management, promoting eco-friendly activities, etc.

- a) Buildings are specifically designed with broad windows and wide passages to utilize sunlight and ventilation.
- b) PESIAMS has ample number of trees with around 55 trees and shrubs are present in Campus.
- c) Sewage is treated in STP located in the campus. Treated effluent is used for gardening and sprinkling of lawns in the campus.
- d) PESIAMS has installed Solarizers for water heating in the year 2009 and is planning to install rooftop solar PV system in 2020.
- e) PESIAMS started e-book facility in 2011.
- f) Understanding the importance of efficient energy use, PESIAMS has initiated the process of replacing all the conventional tube lights with LEDs.

5. Recommendations / Suggestions

5.1 For Indoor Air Quality

- a) Indoor plants can be chosen in such a way that they give aesthetic appearance as well as health benefits.
- b) Information on sources, impacts and mitigation of indoor air pollution to be displayed within AIET for increasing awareness about indoor air pollution. E.g. Signage can be put in chemistry laboratory for handling fuming chemicals.

5.2 For Water Conservation

- a) Rooftop Rain Water harvesting system can be implemented through which rain water is captured from the roof catchments and stored in reservoirs.
- b) Provide information on water usage and savings, to students/ staff through notices, screen savers in computer laboratories, and encourage reduction/ wastage of water.
- c) Replace all old water faucets with water saving faucets such as prismatic taps, aerator taps, jet sprays etc. Installation of such faucets can save water and help in minimizing the water footprint.
- d) Grey water/ sewage recycling system can be installed for flushing toilets. This will reduce the fresh water footprint.
- e) Installation of waterless urinals can be considered to reduce water consumption.
- f) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.
- g) Since the PESIAMS has kitchens, water quality must be analyzed at a regular intervals and reports to be compared with standards and records shall be maintained.
- h) Records of leakage complaints should be maintained to quantify water saved.

- i) Signages/ posters should be posted in high water consumption areas in Academic Blocks to increase awareness regarding water conservation.
- j) As the one of the sources of water is borewell, PESIAMS can install water meter on borewell line to monitor daily borewell withdrawal.

5.3 For Improving Energy Consumption

- a) PESIAMS has conducted Energy Audit during October 2020. Suggestions and recommendations given in the energy audit report to be followed for energy conservation.
- b) Standard Operation Procedures (SOPs) should be prepared and followed for purchasing green equipment. Equipment with star rating, eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier to be preferred except for old computers as the old computers are already being given to 'Sogo Synergy Pvt. Ltd'.
- c) For purchasing new electronic appliances, star rating provided by BEE should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
- d) Notices/ signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all switches when not in use.
- e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas
- f) Every classroom and laboratory with central switch board can have a diagram linking location of a tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
- g) Control sensors can help to reduce consumption by automatically dimming lights when people are not around.
- h) Raise awareness by encouraging students to help in monitoring energy consumption & implement corrective actions and by integrating energy education into classroom learning.

5.4 Paper and other Solid Waste Reduction

- a) Inventories of all solid waste generated in the premises must be maintained to monitor the waste generation.
- b) PESIAMS can consider preparation of Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste.
- c) Food waste quantity from cafeteria and hostel kitchens is considerable. Excess cooked food is sent to pig farm. There is a scope to segregate raw vegetable waste and other wet waste without missing with dry waste and sent for composting. Dry waste also needs to be segregated and recycled as much as possible (plastic, paper, metal, glass etc). Training as well as awareness programs should be organized on reduction of waste and segregation of biodegradable (wet) waste and converting wet waste into compost from the areas other than kitchens.
- d) Efforts should be taken to inform students about recycling options for dry waste and signs should be posted on appropriate bins indicating what could be dumped in each bin.
- e) Plastic bottles to be handed over to Polyethylene terephthalate (PET) recyclers.
- g) Along with beach cleaning, segregation of plastic into different components can also be practiced by students. They can segregate into 7 plastic components (High density Polyethylene (HDPE), Low Density Polyethylene (LDPE), PET, Polyvinyl Chloride, (PVC), Polypropylene (PP), Polystyrene (PS) and multilayered plastic.

5.5 For Overall Safety

- a) All first aid boxes to be maintained properly with all required medicines, disinfectants, band-aids etc. by a designated person. Safety wardens could be identified on each floor, who will maintain the boxes and will be part of emergency response team.
- b) There should be a schedule for safety training, fire-fighting drills, and mock drills and records of them are to be maintained.
- c) Fire extinguishers should be inspected and serviced on a regular basis.
- d) Safety, Health and Environment (SHE) group can be formed, they can have regular meeting and suggestions to be recorded and implemented if found suitable.

5.6 Awareness

- a) In addition to present awareness programs guest lectures, awareness sessions on sustainable resource management, Sustainable Development Goals (SDG) and mitigation of adverse impacts on environment can be arranged.
- b) Awareness sessions shall be used by students to understand impacts of their actions & inactions on the environment, build knowledge database, develop necessary skills to address

complex environmental issues and encourage them to keep our environment healthy and sustainable. Records of the above to be maintained.

5.7 Others

- a) Evaluate the effectiveness of various environmental programs conducted by the institute. Set annual targets for Green Initiatives & monitor them closely.
- b) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness (ergonomics, water conservation etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode or wallpapers informing students about environment conservation can be created.
- c) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.

ANNEXURE I- Green Initiatives by PESIAMS (2016- 2020)

Year	Organized By	Details of Activities
24.07.2014	NSS	A tree plantation program was conducted on 24.07.2014 in the college premises. Mr. Bhojya Naik Registrar (Evaluation) Kuvempu University, Dr. Jogendra Deputy Registrar and Smt. S Y Arunadevi Joint Secretary, PES Trust were present. Planted more than 200 saplings within the campus and made the day a memorable one
09.10.2015	NSS	Sharamadhan Program organized to create the awareness about cleanness
24.07.2015	NSS	Vanamahostav Divas celebrated by the students of PESIAMS for the purpose of imparting eco friendliness and conserving nature
18.03.2015	NSS	One day village camp was organized by NSS at Kyathinakoppa to motivate and create awareness about cleanliness among the school children and villagers under the Swatcha Kyathinakoppa Banner
21.8.2015	NSS	Sharamadhan Program organized to keep clean in front of college premises
25.07.2016	NSS	Vanamahostav Program organized by the students of PESIAMS under National Service Scheme
01.10.2017	NSS	Celebration of Mahatma Ghadhi Jayanthi with cleanness drives held in PESIAMS campus
06.10.2017	NSS	Sharamadhan program organized by the students and faculty members of PESIAMS under National Service Scheme to create the awareness about cleanness
27.07.2018	NSS	Street play enacted by PESIAMS students under Swachhata Pakhwada at Gopi circle, Shivamogga. The program presided over by Smt. Arundevi, Director of JSS & trustee, PES Trust and Dr. K Sailatha, Principal PESIAMS and Teaching and Non-teaching staff
06.10.2018	NSS	Celebrated Swachh Bharat Divas by the volunteers by cleaning college campus and Safari surroundings
30.07.2018	NSS	Sharamadhan done by students and faculties at our college premises under Environmental Day
12.02.2019	NSS	Beast out of Waste competition organized to create awareness on how best the waste products can be utilized at its best.
12.03.2020	NSS	Creating awareness on protecting and safeguarding Western Ghats.
12.07.2019	NSS	Students are actively participated in seedball sowing Program at Kalluganguru forest zone of Shivamogga organized by District Administration, Shivamogga in association with NSS unit of Kuvempu University
30.08.2019	YRC	A guest talks on Waste management organized by youth Red Cross wing to create awareness in managing waste among second year students.
21.09.2019	NSS	Sharamadhan program organized by the volunteers of NSS unit by cleaning school premises at Srirampura and conducted various activities in educating children's in keeping environment clean.

ANNEXURE II-Green Audit Check list

PESIAMS campus was audited with respect to Green Audit Checklist developed by the auditing team. Buildings are specifically designed with broad windows and wide passages to utilize sunlight and ventilation. PESIAMS has ample number of trees and plants in the campus. Sewage is treated in STP present at the campus. Understanding the importance of efficient energy use, PESITM has initiated the process of replacing all regular lights with LEDs.

Note: ✓ :- Provided X: - Not Provided P: - Present - :- Not Applicable

Good Daylight Design

Sl. No.	Design feature		Remarks if any
1	Broad door opening	✓	
2	Clerestory/ High windows	✓	
3	Rectangular Building so that sunlight can reach all areas	✓	
4	Enough illumination	✓	Wide windows are present to get natural sunlight.
5	Sunshade	✓	Ample numbers of trees are present in the premises.
6	Light colored fabric curtain or blind for window covering	✓	
7	Operable windows	✓	
8	Use of insulated and tinted glass to filter heat gain	X	
9	Use of exterior louvers to control glare	X	
10	Ultraviolet (UV) filtering windows	X	

Ventilation

Sl. No.	Design feature		Remarks if any
1	Downdraft cooling system a) downward flow of air	X	
2	Ceiling height	✓	Height- 4 to 4.5 m
3	Self-movement ventilators in the roof	✓	
4	Wide corridors	✓	Length- 2.5 m
5	Operable windows	✓	
6	Use of exhaust fans	✓	Exhaust fans are provided in kitchens

Temperature and Acoustic Control

Sl. No.	Design feature		Remarks if any
1	Sand stone cladding outside the walls	✓	
2	Roof design & type (Double/ Mud/ Tiled/ Asbestos etc.)	-	
3	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)	✓	
4	Special walls for temperature control (Thick/Double/cavity/fire/composite/green)	✓	Thick walls are provided
5	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks, Thermocrete etc.)	X	
6	Use of water bodies/fountain	✓	
7	Retrofitting the existing roofs with cool roof technology	-	
8	Climbing creepers fitted to window	X	
9	Use of landscaping as sound barrier	✓	
10	White wash on the terrace	✓	

Water Efficiency & Wastewater Management

Sl. No.	Design feature		Remarks if any
1	Aerators to water taps	✓	Present in all wash rooms
2	Automatic toilet faucets	X	
3	Sprinklers (for plant watering system)	✓	Sprinklers are provided in whole campus
4	Dual flush toilet with cistern	✓	Dual flushing system is provided in all the washrooms
5	Efficient plumbing system	✓	
6	Sewage treatment plant for sewage recycle	✓	STP of capacity 250 KLD is situated within the campus.
7	Rainwater harvesting	P	Planning to install rainwater harvesting system.
8	Regular maintenance for leakage free plumbing system	✓	
9	Use of low flow/flow control water equipment or gadget	X	
10	Water free urinals (No flush urinals/Zero flush urinals/Water less urinals)	X	

Energy Efficiency and On-site Energy Generation Mechanism

Sl. No.	Design feature		Remarks if any
1	Avoid excessive lighting	✓	
2	Computerized monitoring of electrical system	X	
3	Regular maintenance of electrical system	✓	
4	On-site energy generation	✓	Two diesel generators (DG) of capacities 320KVA and 500KVA are present
5	Photocell occupancy sensor for automatic light control	X	
6	Use of day lighting system	X	
7	Use of energy efficient equipment	X	
8	Use of energy saving bulbs (Compact florescent light/LED lights)	P	Currently, 1% of the total lights are LED. PESIAMS has initiated the replacement of regular lights with LEDs.

Waste Management

Sl. No.	Design feature		Remarks if any
1	Sale of books	✓	Books and used papers are sent to authorized recycler
2	Avoid use of paper by going digital	✓	
3	Reuse of printed paper/ envelopes	✓	
4	Printing on both sides of paper	✓	
5	Setting up recycling area/ composting area	✓	Composting pit has been created within the campus
6	Creation of specified junctions for collection of E-waste (E-waste)	✓	E-waste is given to the dealer based on buy-back policy
7	Installation of bins to collect garbage	✓	Ample number of dust bins have been provided in the each floor and also in open areas in the entire campus
8	Recreating in to new sustainable products	X	
9	Use of coloured bins with code to collect garbage	X	
10	Sewage Treatment Plant	✓	STP of capacity 250 KLD is situated within the campus

Universal Access and Efficient Operation and Maintenance of Building

Sl. No.	Design feature		Remarks if any
1	Easy access to the main entrance of the building and minimum two exits	✓	Ground floor has 4 exits and other floors have 1 exit.
2	Elevator	X	
3	Ramp/ stairs with handrails on at least one side	✓	All ramps and stairs have hand rails
4	Preferred car park spaces for specially abled	NA	
5	Restrooms(toilets) in common areas	✓	
6	Uniformity in floor level	✓	
7	Availability of wheel chair	NA	
8	Personalized services by staff for differently abled	NA	
9	Visual warning signage in common and exterior areas	✓	
10	Follow standard procedures for commissioning of electrical / plumbing system	✓	
11	Purchase of standardized and quality material for repair	✓	
12	Regular maintenance of building	✓	In-house maintenance department is present

Green Program

Sl. No.	Design feature		Remarks if any
1	Creation of "Green Team" in the institution	X	
2	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓	
3	Recycling beyond books i.e. paper, aluminium, plastic, e-waste	✓	PESIAMS promotes use of recycled material during various cultural activities and college fest.
4	Reduce, Reuse and recycle of the products (At the time of disposal of library material)	✓	
5	Availability of books / magazines and online resource guide related to sustainability & Green Practices(energy/ water conservation)	✓	
6	Digitization	✓	
7	E-archiving	✓	
8	E-resources: E books, Online Journals, membership of consortium	✓	

ANNEXURE III- Green Steps taken by PESIAMS

Since its inception in 2008, PESIAMS is taking green steps by installing renewable energy system, establishing nature club, reducing paper use in academic activities, E-waste management, promoting eco-friendly activities, etc. National Service Scheme unit of the college is taking initiation in promoting students towards eco friendly practices.

