

GREEN AUDIT REPORT

MAY 2022



**Jaypee University of Information Technology
Waknagat, P.O. Waknaghat, Teh Kandaghat,
Distt. Solan pin-173234 (H.P), India**

Audit Conducted by:



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Energy Service Companies empaneled with Bureau of Energy Efficiency (BEE)

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2. Executive Summary:

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crisis. On this background it becomes essential to adopt the system of the green campus for the institute which will lead to sustainable development. Jaypee University of Information Technology is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends. Being a premier institution of higher studies, the college has initiated " **The Green Campus**" programme few years back that actively promote the various projects for the environment protection and sustainability.

The purpose of this audit is to ensure that the practices followed in the campuses are in accordance with the green policy adopted by the institution. It works on several facets of Green Campus including water conservation, electricity conservation, tree plantation, waste management, paperless work, mapping of biodiversity. With these issues in mind, the specific objectives of the audit are to evaluate the adequacy of the management control framework of environment sustainability as well as the degree to which the departments are in compliance with the applicable regulations, policies and standards. It can make a tremendous impact on students' health and learning, college operational costs and the environment. The criteria, methods and recommendation used in the audit were based on the identified risks.

3. Introduction

Green Audit is a systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting environmental requirements (EPA, 2003). In other words, it is a management tool comprising of systematic, documented, periodic and objective evaluation of the organization, which management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies which would include regulatory requirements and standards applicable (international Chamber of Commerce, 1989).

Green auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of audits. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties.

4. Utility of Green Audit

These are used to help improve existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce a green audit report.

5. Objectives of the Study

The main objectives of the green audit are to promote environmental management and conservation in the institute campus. The purpose of the audit is to identify, quantify, describe and prioritize the framework of environmental sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out green audit are-

- To introduce and make aware students of real concerns of the environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.

6. Methodology

In order to perform a green audit, the methodology included different techniques such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following area to summarize the present status of environmental management in the campus:

- Water consumption and management
- Air quality assessment and management
- Electricity consumption and management
- Sound pollution monitoring
- Waste management
- Biodiversity status of the campus

7. WATER SAVING POTENTIAL & BEST MANAGEMENT PRACTICES

Best management practices (BMPs) are a set of hands-on recommendations that help to identify opportunities and implement programs to save water in college. BMPs are developed for the various water-use categories in the office buildings and for monitoring and operational procedures. They are grouped according to indoor water use, outdoor water use, and monitoring and operational procedures. We can tailor water-saving program by using part or all the BMPs depending on budget and environmental requirements. Tips and information are provided on water-saving amounts and cost recovery to help in prioritizing measures and make the most knock for buck.

Based on the information collected and observations, the following can be recommended to reduce water use and increase its efficiency.

Faucets

Lavatory, bathing and hand wash facilities faucets average water use in the workshop buildings is approximately 28% of the total water received. In some of the faucets water run around 9 litre per minute. Faucets flows can easily be reduced without affecting the comfort of the water user by using appropriate flow regulator technology for these fixtures. This will result in impressive savings of around 50 percent of faucets water use. Flow regulators, especially the aerators are inexpensive and are easy to install and maintain. This is why they are often considered as the low hanging fruits of water saving programs.



Here are the recommended best management practices for achieving water savings for faucets at office building.

- Use pressure compensating and tamper proof aerators that can only be removed

with a 'special' tool to reduce vandalism and theft.

- Regularly clean faucets as sediments may accumulate and reduce the flow.

Recommend flow rate for different type of uses	
Public hand-washing faucet or self-closing faucet	≤ 4.5 litres /min ≤ 1.0 litres /cycle
Restroom faucet	≤ 4.5 litres /min
Kitchen faucet	≤ 8.3 litres/min

Flow per minutes could be set to 2 or 3 or...6 Litres or more as per the requirement. The Flow Control aerator generates thin streams (like shower aerator) of water to cover wider area for rinse, when compared to conventional aerators. This results in lesser-run time of faucet and easiness for user and ultimately water saving. Flow Control Aerator can easily be installed in existing faucets.

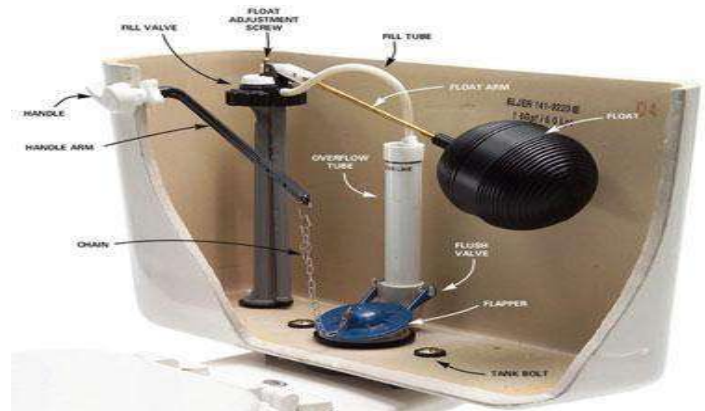
Urinals

Low water use urinals: In some of the standard systems, water is applied automatically through a continuous drip-feeding system or by automated flushing at a set frequency, 24x7, regardless of whether the urinal has been used. Water consumption varies with the system model at an average of 4 litres per flush. Water-efficient urinals use 2.8 litres per flush and in recent times smart flush systems using 0.8 litres per flush have also been launched.

Waterless urinals: There are various technologies available for waterless urinals. In oil barrier technology, the urinals operate using an oil wall between the urine and the atmosphere, preventing odor from escaping. In another technology, the barrier has been replaced by a seal with a collapsible silicone tube that closes after the fluid has passed through it, to prevent gases from flowing into room. A third system uses biological blocks which include microbial spores and surfactants which can be placed into any urinal, thus eliminating water use. By breaking down the urine into components, buildup of sludge and crystals which causes blockages is prevented. Bidets and urinals water use accounts for 3 percent of office buildings water use. These standards shown in the table offer a good water-saving opportunity for water saving in office buildings.

Toilets

A dual-flush toilet is a variation of the flush toilet that uses two buttons or handles to flush different levels of water. A significant way to save water in buildings is to replace single-flush toilets with dual flush toilets. The standard dual-flush toilets use six litres of water on full and three litres on a half-flush.



Replacing old toilets will result to a reduction of 35 percent of toilet water. More cost-effective results can be achieved by replacing only the toilet trim system.

TOILET TANK BANK

With economical, maintenance free 'Green Toilet Bank' it is very easy to save water on toilet flushing, it helps to save 3 liters water on every flushing, with no sacrifice on performance. Toilet Bank filled with water is hanged inside the toilet flushing tank or reservoir. It will displace an amount of water equivalent to 3 Liters in the tank, which means every flush we will save water, thus saving you money. Less the water you use, the less you need to recycle.



8. Saving Water through Monitoring and Operational Procedures

Identifying and Fixing Leaks

The hidden water leaks can cause loss of considerable water and energy without anyone being aware of it. A small leak can amount to large volumes of water loss. Leaks become larger with time, and they can lead to other equipment failure. Fix that leaky pipe, toilet, faucet, or roof top tank to save considerable amount of money and water. The establishment of a leak detection and repair program would be a most cost-effective way to save money and water in the workshop building. Following are some best practices to identify and fixing leaks.

The Management must be committed for providing the staff and resources needed to maintain plumbing fixtures and equipment on a regular basis and assuring prompt identification and repair of leaks.

- Repair staff is given the tools needed and is trained to make leak repair a priority activity.
- Staffs are taught to report leaks and other water-using equipment malfunctions promptly.
- Staffs are rewarded for success.
- Rooftop tank overflow or leakage water should flow to rainwater gutter system not to sewage system to allow detection of rooftop water loss.
- Records of the type, location, number, and repair of leaks are kept in a central location.

Water Metering and Sub-metering

The metering and sub-metering of Main incoming line is essential to understand the water consumption pattern inside the college and hospital building. The accurate measurements enable management to understand maximum and minimum consumption area in the College building and improve water efficiency in the college and hospital building. Monitoring of the water usage allows management to know where and when water is being used and where the best opportunities for water savings exist. Thus, it is recommended to install water meters on each consumption area in the building.

GENERAL RECOMMENDATIONS

Based on the physical inspection and document reviewed on water distribution system of Building, EFS recommends the following recommendations for using water efficiently at College & Hospital Building.

Water tank overflow Alarm system

It is noticed that no alarm as well as level sensor was provided to overhead water tanks. The water alarm system should be installed at all overhead Tank, All PVC rooftop Tanks to avoid over spillage of water. This will help in reduction of wastage of water as well as electricity.

Implementation of water accounting & management system

It was noticed during the audit that water flow meters are nowhere installed at College and Hospital Building. Therefore, it is highly recommended to install digital water flow meters on all the main lines. Digital water meters are also required to install in each section to monitor the section wise water consumption and planning for effective water management. It is also recommended to appoint internal Water Audit team who can inspect water distribution system and for the accounting of water usage in the hospital and college building.

Minimization of leakage water

Leakages were observed in Valves at Hospital and college building resulting in water loss. It is recommended to close out these leakages by replacing faulty valves to avoid wastage of water. It is also recommended to regularly check for leakages and fix them on urgent basis.

Regular Maintenance of toilet system and use of water efficient fixtures

Regular maintenance of the toilets should be carried out. Test for leaks and make necessary repairs promptly. Keep the toilet in working order by periodically inspecting and replacing flappers and other defective parts. Water efficient fixtures such as aerator and water efficient taps need to be used to reduce water consumption.

Capacity building of Staff Involved in Water Distribution

The Management of Jaypee University of Information Technology may arrange capacity building and awareness programs for the staff engaged in water distribution.

OVERALL AIM FOR WATER CONSERVATION: ON THE WAY FORWARD WITH THE 3-R CONCEPT

“Water conservation is defined as any action that reduces the amount of water withdrawn from

water supply sources, reduces consumptive use, reduces the loss or waste of water, improves the efficiency of water use, increases recycling and reuse of water, or prevents the pollution of water”.

Reduce

Reduction at Source

- Better operating controls such as arresting leakages
- Installation of water saving devices such as water tank alarm at all overhead tanks
- Change of device/ equipment such as replacement of water pumps and motor with energy efficient pumps and motors
- Process modification such as use of sprinklers for watering plants and garden

Recycle & Reuse

- Use of treated water in toilets flushing, gardening, fountains, fire fighting equipment's
- Use of storm water as Cooling Tower make-up water after treatment.
- Using storm water & sanitary water as fire water after treatment.
- Reduction of Fresh Water usage supplemented through waste water treatment.
- Direct use of Rain Water Harvesting through storage tanks

Recharge

- Installation of recharge wells / rain water harvesting pits for recharging ground water tables.
- Total recharging capacity (during rain time) to be estimated in 3mm/hr.
- Rain Water Harvesting and conservation.

9. Water consumption (Asset) Management

List of water assets is detailed below.

S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
1	Academic Block	LVL-2	7	7		1	1	1
		LVL-1	2	2				
		LVL 0	5	4		2		1
		LVL+1	10	12		1	1	1
		LVL+2	12	13		1		
		LVL+3	8	10		1		1
		LVL+4						
2	Civil Engg. Deptt.	Floor LVL+2	1	1				
		Floor LVL+1	1	1				
		Ground	1	1		1		
		LVL-1	1	1				
		LVL-2	1	1			1	
		LVL-3	1	1		1		
		LVL-4	1	1			1	
3	Laundry	ESS	4	2	2			
4	Hostel H-1	Floor 1,2,3,4,5,6,&7	19	13	13	1		
5	Hostel H-2	Floor 1,2,3,4,5,6,&7	19	13	13	1		
6	Hostel H-3	Floor 1,2,3,&4	8	8	8	1		
7	Hostel H-4	Floor 1,2,3,4,5,6,&7	18	13	13	1		
8	Hostel H-5	Floor 1,2,3,4,5,6,7,8,9&10	24	16	16	1		
9	Hostel H-6	Floor 1,2,3,4& 5	10	10	10	1		
10	Hostel H-7	Floor 1,2,3,4,5,6,&7	19	12	12	1		
11	Hostel H-8	Floor 1,2,3,4,5,6	12	8	8	1		
12	Hostel H-9	Floor 1 & 2	6	4	4	1		
13	Hostel H-10	Floor 1 & 2	6	4	4	2		
14	Hostel H-11	Floor 1,2,3,4,5,6,7&8	15	11	11	1		
15	Hostel H-12A	Floor 1,2,3,4,5,6,7,8&9	25	17	17	1		
16	Hostel H-12B	Floor 1,2,3,4,5,6,&7	18	12	12	1		
17	Hostel H-12C	Floor 1,2,3,4,5,6,7,8&9	25	17	17	1		
18	Hostel H-12D	Floor 1,2,3,4,5,6,7&8	22	15	15	1		
19	Hostel H-14A	Floor 1,2,3,&4	7	7	7	1		
20	Hostel H-14B	Floor 1,2,3,4,5,6,&7	18	12	12	1		
21	Hostel H-14C	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
22	Hostel H-14D	Floor 1,2,3,4,5,6,7,8&9	26	17	17	1		
23	Hostel H-15A	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
24	Hostel H-15B	Floor 1,2,3,4,5,6,&7	19	13	13	1		
25	Hostel H-15C	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		
26	Hostel H-15D	Floor 1,2,3,4,5,6,7,8,9&10	28	19	19	1		

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S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
27	Dispensary	Staff	2	1	1	1	1	
		Boy Ward	1	1	1			
		Girl Ward	1	1	1			
		Medical Attendent Room	3	3	3	1	1	
28	Faculty Residence	E1 Type Tower 1 BHK(Flat no 7)	7	7	7	6	7	
29	Faculty Residence	E2 Type Tower 1 BHK(Flat no 8)	8	8	8	8	8	
30	Faculty Residence	E2 Type Tower 2 BHK(Flat no dormitory)	2	2	2		2	
31	Faculty Residence	D1 Type Tower 2BHK=8	16	16	16	8	8	8
		D1 Type Tower 1BHK=2	2	2	2		2	
32	Faculty Residence	D2 Type Tower 2BHK=8	16	16	16	8	8	8
		D2 Type Tower 1BHK=2	2	2	2		2	
33	Faculty Residence	C1 Tower 2 BHK=6	12	12	12	6	6	6
		C1 Tower 1 BHK=2 (Dormitory)	2	2	2		2	
34	Faculty Residence	C2 Tower 1 BHK=6	12	12	12	6	6	6
		C2 Tower 1 BHK=1 (Dormitory)	1	1	1		1	
35	Faculty Residence	C3 Tower 2 BHK=6	12	12	12	6	6	6
		C3 Tower 1 BHK=1 (Dormitory)	1	1	1		1	
36	Faculty Residence	B1 Tower 2 BHK=5	10	10	10	6	5	5
		B1 Tower 2 BHK=1	1	1	1		1	
		B1 Tower Dormitory=2	3	3	3	1		
37	Faculty Residence	B2 Tower 2BHK=6	12	12	12	6	6	6
		Club	1	1		1	1	
38	Faculty Residence	B3 Tower 2BHK=6	12	12	12	7	6	5
		B4 Tower 2BHK=5	10	10	10	5	5	
		B4 Tower 2BHK=1	1	1	1		1	
		B4 Dormitory=1	2	3	2	1		
39	Exchnage Block	LVL 0, 1BHK	2	2	2	2	2	
		LVL-1 Dormitory	4	3	3	1	1	
		LVL-2, 1BHK	2	2	2	2	2	
		LVL-3 Dormitory	3	3	3		1	
		LVL-4 Dormitory	2	2	2			
40	Guest House(Vasant Bhawan)	VIP Rooms=14	14	14	14	1	1	
		Extra Toilet	2	2	2			
		SOR Dormitory	2	2	2			
		Driver Room	1	1	1			

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S. N	Building Name	Floor Name	Hand Wash	W. C	Shower/Bath	Water cooler	Pantry/Kitchen	For Cleaning
41	Faculty Residence	A Type Faculty 03 BHK=05 nos	15	15	15	1	5	5
		A Type Faculty 02 BHK=01 nos	2	2	2	1	1	1
		A Type Faculty 02 BHK=01 nos	1	1	1	1	1	1
42	FH-2 Guest House	Rooms=10 Nos	10	10	10	1		
	FH-3 Guest House	Rooms=8 Nos	8	5	5	1		
	Dormitory LVL+1	Rooms=8 Nos	8	6	6	1		
	Dormitory LVL 0	Rooms=8 Nos	8	6	6	1		
43	Annapurna	LVL 0	22	4		4	1	1
		LVL-1	6	2			1	1
44	Annapurna	FH-2	5				1	1
45	F Block	Ground LVL	4	4	4	4		
		LVL+1	4	4	4	4		
		LVL+2	4	4	4	4		
		LVL-1	2	2	2	2		
		LVL-2	1	1	1	1		
46	Security Post	Main Gate	1	1			1	
47	Main Store		1	1			1	
TOTAL			769	606	538	538	110	64

10. Electricity consumption (in Units) and management

MONTH	'KWH CONSUMPTION	KVAH CONSUMPTION	FIXED CHARGE	ENERGY CHARGES (INR)	PF	CONTRACT DEMAND (KVA)	MAX DEMAND (KVA)	BILLING DEMAND (KVA)	NET AMOUNT PAYABLE (INR)
May-21	108375	109970	156870	516624	0.99	1245	316	1121	689543
Jun-21	106930	107210	156870	503887	1.00	1245	227	1121	676424
Jul-21	101440	101665	156870	477826	1.00	1245	234	1121	601331
Aug-21	107970	108305	156870	509034	1.00	1245	226	1121	681725
Sep-21	114530	114760	156870	539372	1.00	1245	272	1121	712973
Oct-21	123680	124140	156870	583458	1.00	1245	394	1121	758382
Nov-21	196840	197435	156870	927945	1.00	1245	496	1121	1113202
Dec-21	239320	240050	156870	1128235	1.00	1245	604	1121	1319502
Jan-22	323920	326945	156870	1536642	0.99	1245	679	1121	1740161
Feb-22	208665	208885	156870	981760	1.00	1245	538	1121	1168632
Mar-22	218620	218635	156870	1027585	1.00	1245	647	1121	1215832
Apr-22	284445	284445	156870	1336892	1.00	1245	644	1121	1534379

11. Sound Pollution Monitoring

The human ear is constantly being assailed by man-made sounds from all sides, and there remain few places in populous areas where relative quiet prevails. There are two basic properties of sound, (1) loudness and (2) frequency. Loudness is the strength of sensation of sound perceived by the individual. It is measured in terms of Decibels. Just audible sound is about 10 dB, a whisper about 20 dB, library place 30 dB, normal conversation about 35-60 dB, heavy street traffic 60-75 dB, boiler factories 120 dB, jet planes during take-off is about 150 dB, rocket engine about 180 dB. The loudest sound a person can stand without much discomfort is about 80 db. Sounds beyond 80 dB can be regarded as pollutant as it harms hearing system. The WHO has fixed 45 dB as the safe noise level for a city to avoid sleep disturbances. For international standards a noise level up to 65 dB is considered tolerable. Frequency is defined as the number of vibrations per second. It is denoted in Hertz (Hz). Sound pollution is another important parameter that is taken into account for green auditing of the College Campus. Different sites were chosen for the monitoring purpose.

Sr.No	Location	Sound DB	
		Min	Max
1	THANK YOU GATE	48	54
2	COLLEGE MAIN GATE	52	54
3	PARKING AREA	48	52
GROUND FLOOR			
4	AMPHITHEATER(AUDITORIUM)	47	53
5	RECEPTION	49	51
6	ADMINISTRATION OFFICE	46	52
7	REGISTRAR OFFICE	45	50
8	MEETING ROOM	45	52
9	HR OFFICE	50	54
10	LEARNING RESOURCE CENTRE(LRC)	47	52
11	COMPUTER LABS CL-7, CL-8	52	55
12	CLASS ROOMS CR-3, CR-4	49	52
13	LECTURE THEATERS LT-1, LT-2	46	48
FIRST FLOOR			
14	COMPUTER LABS CL-9, CL-10, CL-11	52	54
15	TUTORIAL ROOMS TR-1, TR-2, TR-3, TR4	48	55
16	FACULTY (HSS, IT, CSE)	49	54
17	CLASS ROOMS CR-5, CR-6, CR-7, CR-8, CR-9, CR-10	48	51
18	LECTURE THEATERS LT-3	50	53
19	PANTRY	49	52

Sr.No	Location	Sound DB	
		Min	Max
20	BOARD ROOM	47	55
21	ECE LAB-6	49	54
22	PHYSICS LAB-1	45	50
SECOND FLOOR			
23	GENOMIC TECHNOLOGIES LAB	49	52
24	CLASS ROOMS CR-11, CR-12	46	52
25	DIRECTOR'S & DEAN (A&R) OFFICE	52	54
26	COMPUTER LAB CL-1	48	55
27	U.G. BIOTECH LAB-4	49	52
28	TUTORIAL ROOMS TR-5, TR-6, TR-7	47	55
29	FACULTY (ECE, BT&BI, PMS, MATH, HSS)	49	54
30	VICE CHANCELLOR'S OFFICE	45	50
31	PRO CHANCELLOR'S OFFICE	48	55
32	BIOINFORMATICS LAB	52	54
33	ECE LABS-3,4,5	48	55
34	CHARACTERIZATION LAB	47	55
THIRD FLOOR			
35	EM. ANALYSIS LAB	45	50
36	PROBIOTICS AND GUT SIMULATION LAB	47	53
37	PHYSICS LAB-2	52	54
38	PG. BIOTECH LAB	48	55
39	RESEARCH LAB ECE, CSE, BI, e-YANTRA, IOT	46	52
40	SERVER ROOMS	45	50
41	LANGUAGE LAB	45	52
42	C.V.D.LAB	50	54
43	U.G. BIOTECH LAB-3	47	52
44	FACULTY (BT&BI)	52	55
45	ECE LABS-1, 2, 7	47	55
46	P.G.LAB	46	48
47	COMPUTER LABS CL-3, CL-4, CL-5, CL-6, CL-12	49	52
48	MATERIAL SCIENCE LAB	47	55
49	GROUP DISCUSSION ROOM	49	54
FOURTH FLOOR			
50	BIOTECH LABS	46	52
51	CLASS ROOMS 16, 17, 18, 19	52	54
LOWER LEVEL-1			
52	ACCOUNT & FINANCE	48	55
53	CLASS ROOMS CR-1, CR-2	47	55
54	CONTROLLER OF EXAMINATION	49	54
LOWER LEVEL -2			
55	WATER FILTER ROOM	52	54

Sr.No	Location	Sound DB	
		Min	Max
56	RECORD ROOM	48	55
57	TELEPHONE EXCHANGE	47	55
58	TUCK SHOP	49	54
LOWER LEVEL-3			
59	IPR CELL	50	54
60	TIED CELL	47	52
61	PANJAB NATIONAL BANK	52	55

**Recommended sound level as set in CPCB-Environmental Standards-
Noise (ambient standards) dB (A)**

SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

- Note:-
- Day time shall mean from 6.00 a.m. to 10.00 p.m.
 - Night time shall mean from 10.00 p.m. to 6.00 a.m.
 - Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
 - Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

12. Air Quality Monitoring

Since air quality plays a vital role for good health. Air Quality monitoring instrument is used to monitor quarterly the criteria pollutants. The most important air quality parameters, which are measured, are Humidity, PM 2.5 & PM10. The other criteria pollutants such as Ozone, Carbon Monoxide, NO₂, SO₂ and Lead are not measured because there are no nearby Industries located near the institute, which are emitting these pollutants. Noise equally plays a vital role in the environment; hence noise measurement is also done at the institute quarterly.



Respirable Dust Sampler

13. Waste Disposal

Waste disposal include the activities and actions required to manage waste from its inception to its final disposal. This includes the collection, transport, treatment and disposal of waste, together with monitoring and regulation of the waste management process.

Waste can be solid, liquid, or gas, each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological and household. In some cases, waste can pose a threat to human health. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce adverse effects of waste on human health, the environment or aesthetics.

Waste management practices are not uniform among countries (developed and developing nations) regions (urban and rural areas), and residential and industrial sectors can all take different approaches.

A large portion of waste management practices deal with municipal solid waste which is the bulk of the waste that is created by household, industrial, and commercial activity.



Jaypee University of Information Technology has employed waste bins for proper segregation of solid wastes in the campus.

Number of dustbins listed below:

Details of dustbin & approx. waste disposal

1. No of dustbin: - 400 approx.
2. Waste disposal quantity 24,000 KG approx. per month

15. Biodiversity status of the college campus

Introduction

To conserve this biodiversity, our first need is to learn about the existing diversity of the place. Unless we know whom to conserve, we will not be able to plan proper conservation initiatives. Also, it is important to have an understanding of the bio-diversity of an area so that the local people can be aware of the richness of bio-diversity of the place they are living in and their responsibility to maintain that richness.

In today's world, among the popular conservation measures which are taken to spread wildlife and environmental awareness, butterfly gardens can be placed in a significant position. To create butterfly garden, we need to know which associate plants and other fauna are present in the surrounding. This study allows us to understand the faunal and floral diversity of the surrounding areas of the college premises and their inter-relationship.

Objectives

The main objective of this study is to get a baseline data of bio-diversity of the area which will include:

- Documentation of the floral diversity of the area, its trees, herbs, shrubs and climbers.
- Documentation of the major faunal groups like mammals, reptiles, amphibians, birds and butterflies.
- Documentation of the specific interdependence of floral and faunal life.

Method of Study

A brief methodology for the floral and faunal survey is given below.

1. Sampling was done mostly in a random manner.
2. The total area was surveyed by walking at the daytime.
3. Surveys were conducted for the maximum possible hours in the daytime.
4. Tree species were documented through physical verification on foot.
5. For faunal species, we emphasized mainly on the direct sighting. Also call of various birds and amphibians and nesting of some faunal species were considered as direct evidences.

6. Observing mammals depend critically on the size of the species and its natural history. Diurnal species are common and highly visible. Nocturnal species, however, are rare and difficult to detect. Small mammals like the field rats were found near their burrows, particularly during their entry or exit times in or out from their burrows respectively. In some cases, dung deposits and footprints were also observed that served as a potential clue for the presence and absence of the concerned species. These secondary evidences were all noted with time and space coordinates.
 7. Birds are often brightly colored, highly vocal at certain times of the year and relatively easy to see. Sampling was done on the basis of direct sighting, call determination and from the nests of some bird species.
 8. Reptiles were found mostly by looking in potential shelter sites like the under surface of rocks, logs, tree hollow sand leaf litter and also among and under neath the hedges. Sometimes some species, particularly the garden lizards were also observed in open spaces (on twigs and branches and even on brick constructions) while they were basking under direct and brightsunlight.
 9. Amphibians act as potential ecological indicators. However, most of them are highly secretive in their habits and may spend the greater part of their lives underground or otherwise inaccessible to biologists. These animals do venture out but typically only at night. They were searched near pond, road beside wetland and in other possible areas. Diurnal search operations are also *successful*.
 10. Active invertebrates like the insects require more active search. For larger winged insects like butterflies, random samplings were carried and point sampling was alsodone.
 11. The easiest way to observe many of the invertebrates is simply looking for them in the suitable habitat or micro-habitat. Searching was carried out under stones, logs, bark, in crevices in the walls and rocks and also in leaf litter, dung etc. Slugs and snails are more conspicuous during wet weather and especially at night when they were found using a torch.

Faunal Species

The list of Fauna indicates that the college campus is significantly rich in faunal diversity. We have seen a significant number of bird nests at many places. We have not been able to document other insect groups during this survey. The year long survey will add some more fauna in the checklist for sure after the seasonal survey.

Table 01: Checklist of Faunal groups with species number

1.	Birds	15	Table-2
2.	Reptiles	1	Table-3
3.	Amphibians	2	Table-4
4.	Butterflies	22	Table-5

Table 02: Checklist of Birds

No.	Common Name	Scientific Name	Family
1	Common HawkCuckoo	Hierococcyx varlus	Cuculidae
2	Common Hoopoe	Upupa epops	Upupidae
3	Common Iora	Aegithirna tipsia	Aegithinidae
4	Common Kingfisher	Alcedo atthis	Alcedinidae
5	Common Myna	Acridotheres tristis	Sturnidea
6	Common Pigeon	Colnmba livia	Columbidae
7	Common Sandpiper	Actitis hypoleucos	Scolopacidae
8	Common Tailorbird	Orthotomus sutortus	Cisticolidae
9	Coppersmith Barbet	Megalaima haemacephala	Ramphastidae
10	House Crow	Corvus splendens	Corvidae
11	House Sparrow	Passer domesticus	Passeridae
12	Indian Cormorant	Phalacrocorax fuscicollis	Phalacrocoracidae
13	Pale-billed Elowerpecker	Dicoeum erythrorynchos	Dicaeidae
14	Taiga flycatcher	Ficedula albicilla	Muscicapidae
15	Yellow-footed Green Pigeon	Treron phoenicoptera	Columbidae

Table 03: Checklist of Reptiles

No.	Common Name	Scientific Name	Family
1.	Rat Snake	Zamenis longissimus	Colubridae

Table 04: Checklist of Amphibians

No.	Common Name	Scientific Name	Family
1	Indian Toad	Duttaphrynus melanostictus	Bufoidea
2	Frog	Enphldctis cyanophlyctis	Dicroglossidae

Table 05: Checklist of Butterflies

No.	Common Name	Scientific Name	Family
1	Blue Mormon	Papilio polymnestor	Papilionidae
2	Common Jay	Graphium doson	Papilionidae
3	Common Mime	Papilo clytia	Papilionidae
4	Common Mormon	Papilo polytes	Papilionidae
5	Common Rose	Pachliopta aristolochiae	Papilionidae
6	Lime Butterfly	Papitto demolis	Papilionidae
7	Tailed Jay	Graphium agamemnon	Papilionidae
8	Small Grass Yellow	Furema brigitta	Pieridae
9	Common Grass Yellow	Eurema hecabe	Pieridae
10	Common Gull	Cepora nerissa	Pieridae
11	Indian Jezebel	Delias eucharis	Pieridae
12	Indian Wanderer	Pareronia hippia	Pieridae
13	Lemon Emmigrant	Catopsila Pomona	Pieridae
14	Mottled Eemigrant	Catopsilia pyranthe	Pieridae
15	Psyche	Leptosia nina	Pieridae
16	Common Cerulean	Jamides celeno	Lycaenidae
17	Common Lineblue	Prosotosnora	Lycaenidae
18	Tailless Lineblue	Prosotas dubiosa	Lycaenidae
19	Common Pierrot	Castalius rosimon	Lycaenidae
20	Common Quaker	Neopithecops zalmora	Lycaenidae
21	Dark Grass Blue	Zizeeria karsandra	Lycaenidae
22	Forget-me-not	Catochrysops strabo	Lycaenidae

Floral species:

Number of Floral species observed: 125

The list of Flora indicates a significant diversity of plants which indicates the overall richness of the place. We have classified the overall flora in 8 groups. The most diverse group is the tree whereas there are 1 species of ornamental plant which shows the least diversity.

Table 06: Checklist of Floral groups with species number

1	Trees	14	Table 7
2	Grasses	2	Table 8
3	Herbs	36	Table 9
4	Shrubs	28	Table 10
5	Creepers	24	Table-11
6	Ornamental Plants	1	Table 12
7	Palms	7	Table 13
8	Fern & Season flower	13	Table-14

Table 7: Checklist of Trees

No.	Common Name	Scientific Name	Family
1	Ficus	Ficus Sp.	Moraceae
2	Amla	Emblica officinalis	Euphorbiaceae
3	Guava	Psidium guajava	Myrtaceae
4	Rosemallows	Hibiscaceae	Hibiscus
5	Champaca	Magnolia champaca	Magnoliaceae
6	Cycas	Cycas	Cycadaceae
7	Crepe Jasmine	Tabernaemontana Divaricata	Apocynaceae
8	pomegranate	Punica granatum	Punicaceae
9	Ashoka Tree	Saraca asoka	Fabeceae
10	Kadam	Anthocephalus chinensis	Rubiaceae
11	Indian Almond	Terminalia catappa	Combretaceae
12	Lichi	Litchi chinensis	Sapindaceae
13	Vilayati Babul	Pithecolobium dulce	Mimosaceae
14	Neem Tree	Azadirachta indica	Meliaceae

Table 8: Checklist of Grasses

No.	Common Name	Scientific Name	Family
1	Common Carpetgrass	Axonopus sp.	Poaceae
2	Durba	Cynodon dactylon	Graminae

Table 9: Checklist of Herbs

No.	Common Name	Scientific Name	Family
1	Curry tree	Murraya koenigii	Rutaceae
2	White cedar	Thuja occidentalis	Cupressaceae
3	Banyan tree	Ficus benghalensis	Moraceae
4	Yellow oleander	Cassipouira thevetia	Apocynaceae
5	Aloe vera	Aloe vera	Asphodelaceae
6	Barberry	Berberis vulgaris L	Berberidaceae
7	Lemon	Citrus Limonum	Rutaceae
8	China rose	Hibiscus rosa-sinensis	Malvaceae
9	Neem	Azadirachta indica	Mahaceae
10	Tulsi	Ocimum sanctum	Lamiaceae
11	Toon	Toona sinensis	Meliaceae
12	Ashok	Saraca Asoca	Caesalpiniaceae
13	Amla	Emblica officinalis	Euphorbiaceae
14	Henna/mehndi	Lawsonia inermis	Lythraceae
15	Marigold	Tagetes erecta	Asteraceae
16	Tej Patta	Cinnamomum tamala	Lauraceae
17	Arjun	Terminalia arjuna	Combretaceae
18	Aswagandha	Withania Somnifera	Solanaceae
19	Jamun	Syzygium cumini	Myrtaceae
20	Candyleaf	Stevia rebaudiana	Asteraceae
21	Tamarind (Imli)	Tamarindus indica	Fabaceae
22	Drumstick-Tree	Moringa oleifera	Moringaceae
23	Kachnar	Bauhinia variegata	Fabaceae
24	Lemon grass	Cymbopogon citratus	Poaceae
25	Safed aak	Calotropis Gigantea	Apocynaceae
26	Datura (Yellow)	Datura stramonium	Solanaceae

27	Datura (Black)	Datura stramonium	Solanaceae
28	Red oleander	Cascabela thevetia	Apocynaceae

29	Sudarshana	Crinum latifolium	Amaryllidaceae
30	Kapur	Cinnamomum camphora	Lauraceae
31	Babri	Eclipta prostrata	Asteraceae
32	Common guava	Psidium guajava	Myrtaceae
33	Rose	Rosa rubiginosa	Rosaceae
34	Bakaian	Melia azedarach	Mahogany
35	Rangoon creeper	Quisqualis indica	Combrataceae
36	Bael (Wood apple)	Aegle marmelos	Rutaceae

Table 10: Checklist of Shrubs

No	Common Name	Scientific Name	Family
1	Giant Milkweed	Calotropis gigantea	Asclepiadaceae
2	Ban jamir	Glycosmis pentophylla	Ruraceae
3	Fever tea	Lippia javanica	Verbenaceae
4	Fever tea	Lippia javanica	Verbenaceae
5	Jasmine	Jusm inum pubescens	Oleaceae
6	Clerodendrum	Clerodendrum viscosum	Verbenaceae
7	Ground Fig	Ficus heterophylla	Moraceae
8	Bleeding Heart	Clerodendrum tiomsoniae	Lamiaceae
9	Stinking Cassia	Cassio tora	Fabaceae
10	Chitrak	Plumbago zeyla nica	Plumbaginaceae
11	Duranta	Duranta repens	Verbenaceae
12	GardenCosmos	Cosmos bipinna tus	Asteraceae
13	Devil's Trumpets	Datura sp.	Solanaceae
14	Dracaena	Pleomele reflea	Asparagaceae
15	Lagerstroemia	Lagerstroemia indica	Lythraceae
16	Citrus/Citron	Citrus medica	Rutaceae
17	Rose	Rosa sp. Var.	Rosaceae
18	Wild Pmumeria	Plumeria pudica	Apocynaceae
19	Wild Eggplant	Solanum Totvum	Solanaceae
20	Indian heliotrope	Heliotropium indiciim	Boraginaceae
21	Heliconia	Strelitzia sp.	Musaceae
22	Common Wireweed	Sida acuta	Malvaceae
23	Thuja	Thuja orientalis	Cupressaceae
24	Chinese Rose	Hibiscus rosa -sinensi's	Malvaceae
25	Lime	Citrus acida	Rutaceae
26	Orange Jasmine	Mn rraya paniculata	Rutaceae

27	Oleander	Nerium oleander	Apocynaceae
28	Karipata	Murraya Koenigii	Rutaceae

Table 11: Checklist of Creepers

No.	Common Name	Scientific Name	Family
1	Aparajita	Clitoria ternatea	Fabaceae
2	Birdfoot Grape-Vine	Cayratia pedata	Vitaceae
3	Passion Flower	Passiflora suberosa	Passifloraceae
4	Cayratia	Coratia trifolia	Vitaceae
5	Corkystem Passionflower	Passiflora suberosa	Passifloraceae
6	Birdfoot Grape-Vine	Cayratia sp.	Vitaceae
7	Gulanchalata	Tinospora cordifolia	Menispermaceae
8	Titakunja	Wattakaka votubillis	Asclepiaceae
9	Bengal Trumpet Vine	Thunbergia grandiflora	Acanthaceae
10	Ipomoea	Ipomoea aquatic	Convolvulaceae
11	Indian Stinging Nettle	Tragia involucrata	Euphorbiaceae
12	Money Plant, Ivy Arum	Epipremnum aureum	Araceae
13	Snake Vine	Stephania japonica	Menispermaceae
14	Philodendron	Philodendron sp.	Araceae
15	Chinese creeper	Micania micrantha	Asteraceae
16	White Morning Glory	Ipomoea obscura	Convolvulaceae
17	Telakuchu	Coccinia grandis	Cucurbitaceae
18	Tiliacora	Tiliacora racemosa	Menispermaceae
19	Roundleaf Bindweed	Evolvulus Nummularius	Convolvulaceae
20	Justicia	Justicia simplex	Acanthaceae
21	Hemigraphis	Hemigraphis hirta	Acanthaceae
22	Climbing Mallotus	Allostictum repandus	Euphorbiaceae
23	Bougainvillea	Bougainvillea sp.	Nyctaginaceae
24	Allamanda	Allamanda sp.	Apocynaceae

Table 12: Checklist of Ornamental Plant

No.	Common Name	Scientific Name	Family
1	Dracena (Red)	Dracena fragrans	Liliaceae

Table 13: Checklist of Palms

No.	Common Name	Scientific Name	Family
1	Areca Palm	Dypsis Intescens	Arecaceae
2	Bottle Palm	Hyoyhorbe lagenicaulis	Arecaceae
3	Indian Datepalm	Phoenix sylvestris	Palmae
4	Coconut	Cocos nucifera	Arecaaceae
5	Palmyra Palm	Borassusflabe Hifer	Palmae
6	Areca	Areca catechu	Arecaceae
7	Palmyra Palm	Borassusflabellifer	Arecaceae

Table 14: Checklist of Ferns and Seasonal Flowers

No.	Common Name	Scientific Name	Family	Type
1	Bircl- nest Fern	Asplenium Sp.	Aspleniaceae	Fern
2	Fishtail Fern	Microsorium punctatum	Polypodiaceae	Fern
3	Oakleaf Fern	Drynoriaquercifolia	Polyqodiaceae	Fern
4	Snapdragon	Antirrhinum majus	Scrophulariaceae	Season
5	Garden stock	Matthiola incana	Brassicaceae	Season
6	Gazania	Gazania sp.	Asteraceae	Season
7	Gladiolus	Gladiolus sp.	Iridaceae	Season
8	Flaming Kaaty	Kalanchoeblossfeldiana	Crassulaceae	Season
9	Miaden Pink	Dianthus deltoids	Carryophyllaceae	Season
10	Amaryllis	Hippeastrum Sp	Amaryllideceae	Season
11	Pansy	Viola tricolor var.	Violaceae	Season
12	Petunin	Petunia hybrida	Solanaceae	Season
13	Verbena	Vei-hena sp.	Verbenaceae	Season

Conclusion:

Biodiversity status of college campus found satisfactory.

16. Suggestions and Recommendations

- Sustainable use of resource and ecology balance of the college campus must be maintained through the year.
- The prolific use of insecticides/pesticides should be checked as these harmful chemicals are detrimental and instrumental for killing of insects/butterflies which are natural prey for the birds.
- There is urgent need to form a Green Monitoring Team. The priority of this body is to maintain the greenery of the College campuses.
- The Green Monitoring Team should consist of members from teaching staffs, non teaching staffs, students and if possible try to include some local interested people.
- Vermicompost facility may be practiced, the product of which can be used as manure or fertilizer for plantation purpose.

Drinking Water Quality Standard as per Bureau of Indian Standards IS 10500

S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
Essential Characteristics						
i	Colour, Hazen units, Max.	5	Above 5, consumer acceptance decreases	25	3025(Part-4): 1983	Extended to 25 only if toxic substances are not suspected in absence of alternate sources.
ii	Odour	Unobjectionable	-	-	3025 (Part-5): 1983	a) Test cold and when heated b) Test at several dilutions
iii	Taste	Aggreable	-	-	3025 (Part 7&8):1984	Test to be conducted only after safety has been established.
iv	Turbidity NTU, Max.	5	Above5, consumer acceptance decreases.	10	3025 (Part 10): 1984	
v	pH Value	6.5 to 8.5	Beyond this range the water will affect the mucous membrane and/or water supply system	No relaxation	3025 (Part 11): 1984	
S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
vi	Total Hardness (as CaCO ₃) mg/l, Max.	300	Encrustation in water supply structure and adverse effects on domestic use.	600	3025 (Part 21): 1983	
vii	Iron (as Fe) mg/l, Max.	0.3	Beyond this limit taste/ appearance are affected , has adverse effect on domestic uses and water supply structures, and promotes iron bacteria.	1.0	32 of 3025 : 1964	
viii	Chloride (as Cl) mg/l, Max.0.3	250	Beyond this limit, test, corrosion and palatability are affected.	1000	3025 (Part 32): 1988	
ix	Residual free chlorine mg/l, Min	0.2	-	-	3025 (Part 26)1986	To be applicable only when water is chlorinated. Tested at consumer end. When protection is required, it should be Min 0.5mg/l

S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
x	Fluoride (as F) mg/l, Max.	1.0	Fluoride may be kept as low as possible. High fluoride may cause fluorosis	1.5	23 of 3025 1964	
Desirable Characteristics						
xi	Dissolved solid mg/l, Max.	500	Beyond this palatability decreases and may cause gastro intestinal irritation	2000	3025 (Part 16) 1984	
xii	Calcium (as Ca) mg/l, Max.	75	Encrustation in water supply structure and adverse effect on domestic use	200	3025 (Part 40) 1991	
xiii	Magnesium (as Mg) mg/l, Max.	30	Encrustation to water supply structure and adverse effect on domestic use	100	16.33.34 of IS 3025 1964	
xiv	Copper (as Cu) mg/l, Max.	0.05	Astringent taste, will be caused beyond this discoloration and corrosion of pipes, fitting and utensils	1.5	36 of 3025 1964	

S N	Substance Characteristics	Requirement (Desirable Limit)	Undesirable Effect Outside the Desirable Limit	Permissible Limit in the Absence of Alternate Source	Method of Test (Ref. to IS)	Remarks
1	2	3	4	5	6	7
xv	Sulphate (as SO ₄)	200	Beyond this causes gastro intestinal irritation when magnesium or sodium are present.	400 (sec. col. 7)	3025 (Part 24) 1986	May be extended up 400 provided Magnesium (as Mg) does not exceed 30
xvi	Nitrate (as NO ₂) Mg/l, Max.	45	Beyond this methaemoglobinemia takes place	No relaxation	3025 (Part 34) 1988	
xvii	Cadmium (as Cd) Mg/l, Max.	0.01	Beyond this, the water becomes toxic	No relaxation	See Note 1	To be tested when pollution is suspected
xviii	Arsenic (as As) Mg/l, Max.	0.01	Beyond this, the water becomes toxic	No relaxation	3025 (Part 37) 1988	To be tested when pollution is suspected
xix	Lead (as Pb) Mg/l, Max.	0.05	Beyond this limit, the water becomes toxic	No relaxation	See Note 1	To be tested when pollution is suspected
xx	Zinc (as Zn) Mg/l, Max.	5	Beyond this limit it can cause astringent taste & an opalescence in water	15	39 of 3925 1964	To be tested when pollution is suspected
xxi	Mineral Oil Mg/l, Max.	0.01	Beyond this limit undesirable taste and odour after chlorination take place	0.03	Gas chromatographic method	To be tested when pollution is suspected

Source: Indian Railways Institute of Civil Engineering, Pune

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THANKS



Energy Audit Report

May 2022

**Jaypee University of Information
Technology.**

**Waknagat, P.O. Waknaghat, Teh Kandaghat,
Distt. Solan pin-173234 (H.P), India**

Audit Conducted By

Engineering Facility Services.

Office No.778-779, Gaur city mall, Sector-04, Greater
Noida (Uttar Pradesh) Pin- 201318



Acknowledgement

We take the opportunity to express our deep sense of gratitude towards of **Jaypee University of Information Technology**, in particular, the support and disposition of the **Mr. A.P. Khare (Senior Project Engineer)**, **Mr. Jasveer Singh (Engineer Electrical Department)** & **Mr. Manoj Kumar Sharma (Deputy Chief Engineer, Civil)**, Teaching & Supporting Staff of College for awarding the work of executing Energy Audit in Jaypee University of Information Technology. In particular we wish to thank them for their timely initiative, advice and valuable support extended to the project.

We are also grateful for extending all sorts of help while carrying out energy audit and also for their valuable help regarding the data collection and details at various stages of the project. We are also thankful to them for providing support while conducting survey in Jaypee University of Information Technology.

We would be failing in our duty if we do not thank our respondents, who gave their valuable time and answered the survey questions with tremendous patience and understanding.

(Mr. DEEPAK BAJPAI)

CERTIFIED ENERGY AUDITOR & CHARTERED ENGINEER

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1.0 Introduction

The working details of assignment are as follows:

Project	Energy Audit
Client	Jaypee University of information technology
Industry	University
Contact	Mr. Deepak Ph:91 8826682703 erdeepak6666@gmail.com
Site	Jaypee University of information technology
Consultant	Engineering Facility Services
Duration	May 2022
Project Scope	Examination of detail energy audit in the utility and process to assess the loss in the system.
Report	This document gives recommendations, details of findings and the way forward
Consultants involved	Mr. Deepak Bajpai (Certified Energy Auditor EA-19771) Mr. Ompal Mr. Vikrant Mr. Rajat Katiyar Mr. Gaurav Kumar
Notes	- The critical points are marked in red - The assumptions are marked in blue - The suggestions / alternatives in the audit report are based on the present operating conditions of equipment/systems and to the best of our knowledge. - Investment figures are estimated values and recommended to obtain cost from vendors.

1.1 Summary of Energy Conservation Measures

Table 1. Summary of Energy Conservation Measures

S. No	Energy Conservation Measure	Annual Savings Electricity		Investment	Payback
		kWh	Rs. Lakhs	Rs. Lakhs	Month
Payback 0-12 months					
1	One transformer running	45240	4	-	-
	We recommend you to use only one transformer rather than two				
Payback >24 months					
2	Conventional ceiling fan replacement with BLDC fan	176000	8.3	26.0	37.7
	It is recommended to replace the ceiling fan with BLDC fan				
Total		221240	12.30	26.0	25.36

2.0 Plant description and energy sources

2.1 About Institute

Genesis and Accreditations

The JUIT was conceived by a joint vision of the Govt of Himachal Pradesh and the Founder Chairman of Jaypee Group Shri Jai Prakash Gaur in 2000. Land was provided on lease by the State Govt and the university was established by Act No 14 of 2002 vide Extraordinary Gazette Notification of the Govt of Himachal Pradesh dated May 23, 2002. The University Grants Commission accorded its approval under Section 2(f) of the UGC Act vide their Letter No. F 9-10/2002(CPP-1) dated 09 Dec 2002. The JUIT is also a member of the Association of Indian Universities (AIU).

The academic activities of JUIT commenced from July 2002 and currently offering undergraduate B. Tech degree programs in Bioinformatics, Biotechnology, Civil Engineering, Computer Science & Engineering, Electronics & Communication Engineering, Electronics & Computer Engineering and Information Technology.

Besides B. Tech programs, the university is presently offering M. Tech in Biotechnology, Biotechnology with specialization in Industrial Biotechnology and Medical Biotechnology, Civil Engineering with specialization in Structural Engineering, Construction Management and Environmental Engineering, Computer Science and Engineering, Computer Science and Engineering with specialization in Information Security and Data Science, Electronics and Communication Engineering, Electronics and Communication Engineering with specialization in Internet of Things. M Sc Programs are offered in Biotechnology, and Microbiology.

Doctoral Phd is offered in Biotechnology, Bioinformatics, Civil Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Humanities and Social Sciences, Mathematics, Physics and Materials Science.

The University has been twice accredited by NAAC (2011 and 2017).

The Campus

The University campus is spread over 25 acres of lush green picturesque slopes of Waknaghat hills in the Solan District of Himachal Pradesh. The smart campus is pollution free and enjoys lovely weather throughout the year. The maximum summer temperatures touch 32 to 35 degrees centigrade for one

month in a year. The world class infrastructure has been beautifully designed by M/S Arcop Associates Pvt. Ltd. an eminent Montreal based Canadian architect firm

The infrastructure was built in a phased manner and as of today the JUIT has a built up area of 74228.71 sq m. It encompasses an Academic Block with spacious Auditorium, Lecture Theatres, Classrooms, Tutorial rooms, Laboratories, Administrative Offices, Faculty Offices and Library. The second terrace of the hill has all the hostels, Students Mess, Guestrooms, Helipad, Outdoor sports facilities and Dispensary. The lower terrace of the hill contains the Civil Engineering Dept., Faculty residences, Temple, Laundry facilities and Stores. The entire campus is wifi enabled.

LEARNER CENTRIC EDUCATION PROCESS

JUIT Waknaghat offers a challenging academic environment to its students. It aims to instill the habit of life-long learning and therefore, provides a learner-centric rather than a teacher-centric educational process. The system has been designed to provide students the freedom to learn what they want to learn at a pace determined by them. Post-graduate students are encouraged to develop independence in thought and action as well as the ability to develop solutions that fit problem requirements. These students are trained to acquire the capability to deploy appropriate technology paradigms for given tasks, explore new technology, and lead teams to solve complex problems.

2.2 Energy Sources and Cost

Electricity & Fuel are major energy sources of the plant. Electricity is supplied at 11 kV. There is two 1500 KVA, 11/0.44 kV power transformers to cater electricity demand.

The energy cost from various sources of energy is given below:

Table 2. Energy cost component of energy sources

Source of energy	Unit	Cost
Electricity (Grid)	Rs. /kWh	4.70

2.3 Electricity

The energy demand of the plant is fulfilled by the electricity from Grid. The annual energy consumption from electricity grid sources is as follows:

Table 3. Month wise electrical energy consumption

3.0 Electricity consumption

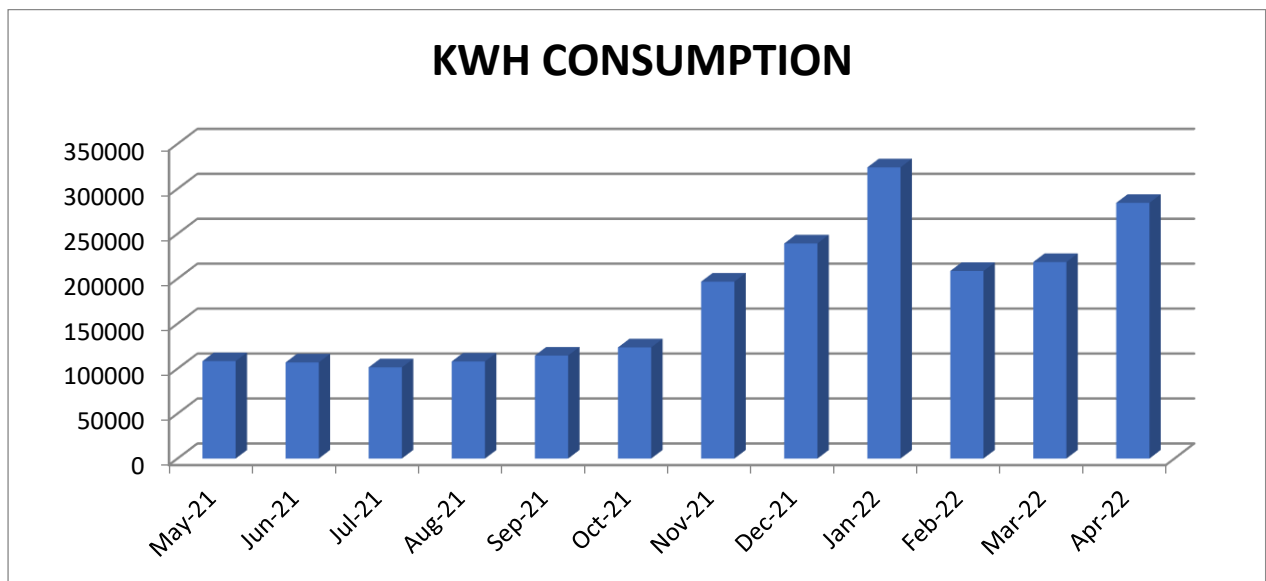
DETAILS OF ELECTRICITY CONSUMPTION FOR THE 2021-2022									
MONTH	KWH CONSUMPTION	KVAH CONSUMPTION	FIXED CHARGE	ENERGY CHARGES (INR)	PF	CONTRACT DEMAND (KVA)	MAX DEMAND (KVA)	BILLING DEMAND (KVA)	NET AMOUNT PAYABLE (INR)
May-21	108375	109970	156870	516624	0.99	1245	316	1121	689543
Jun-21	106930	107210	156870	503887	1.00	1245	227	1121	676424
Jul-21	101440	101665	156870	477826	1.00	1245	234	1121	601331
Aug-21	107970	108305	156870	509034	1.00	1245	226	1121	681725
Sep-21	114530	114760	156870	539372	1.00	1245	272	1121	712973
Oct-21	123680	124140	156870	583458	1.00	1245	394	1121	758382
Nov-21	196840	197435	156870	927945	1.00	1245	496	1121	1113202
Dec-21	239320	240050	156870	1128235	1.00	1245	604	1121	1319502
Jan-22	323920	326945	156870	1536642	0.99	1245	679	1121	1740161
Feb-22	208665	208885	156870	981760	1.00	1245	538	1121	1168632
Mar-22	218620	218635	156870	1027585	1.00	1245	647	1121	1215832
Apr-22	284445	284445	156870	1336892	1.00	1245	644	1121	1534379

4.0 BASELINE ENERGY DESCRIPTION

Building is consuming different sources of energy - Grid Electricity, Electricity from Diesel Generating Sets. Electricity is generally used for all electrical devices while diesel is used to operate the DG sets.

The Building is obtaining the power supply from Himachal Pradesh State Electricity Board Limited through 11kV line which directly feeds into transformer which steps down voltage from 11kV to 433V.

Graph shows the total billed amount in KWH



Lighting, pump/ motor load and HVAC are the major energy consuming components in the building, followed by diesel (very less consumption) used in DG sets.

The building utilizes various energy resources to provide best of the amenities in the management, break up of different resources is given below and this consumption of resources forms the baseline/ benchmarking of the energy use.

4.1.1 Transformer

During energy audit we found that the one transformer 1500KVA is running and other is on standby.

Findings

We found that the other transformer which is on standby is also consuming the power (No load loss)

Recommendations

We recommend discharging the one transformer and using transformer on alternate basis.

Benefits

It reduces the power consumption

Table 4. Saving by one transformer is on off mode

Particular	UOM	Value
Transformer Capacity	KVA	1500
Nos of transformer	Nos	2
Present Condition		
Transformer No Load Losses	KWH	2.6
Proposed Condition		
Saving of Transfer no load loss	KWH	2.6
Operating Hour	Hr/Annum	8700
Yearly saving	KWH	45240
Cost of energy	Rs/KWH	4.7
Monetary Saving	Rs	425,256
Investment	INR	0
Payback	Month	0

4.2 Replace BLDC fans with ceiling fans

4.2.1 Background

During energy audit we found that the institute uses 60 KW ceiling fans.

Findings

We found that the ceiling fan which is of 60KW consume more power.

Recommendations

It is recommended to replace the Institute ceiling fan with BLDC fan immediately and plan to replace the 1000 fan with BLDC fan in first phase.

Benefits

We can replace the existing ceiling fans with the energy efficient BLDC fans. Savings should be taken as when the fan is needed to be changed as when they get faulty. Saving calculation given below.

Table 5. Saving by Ceiling fan replacement with BLDC fan

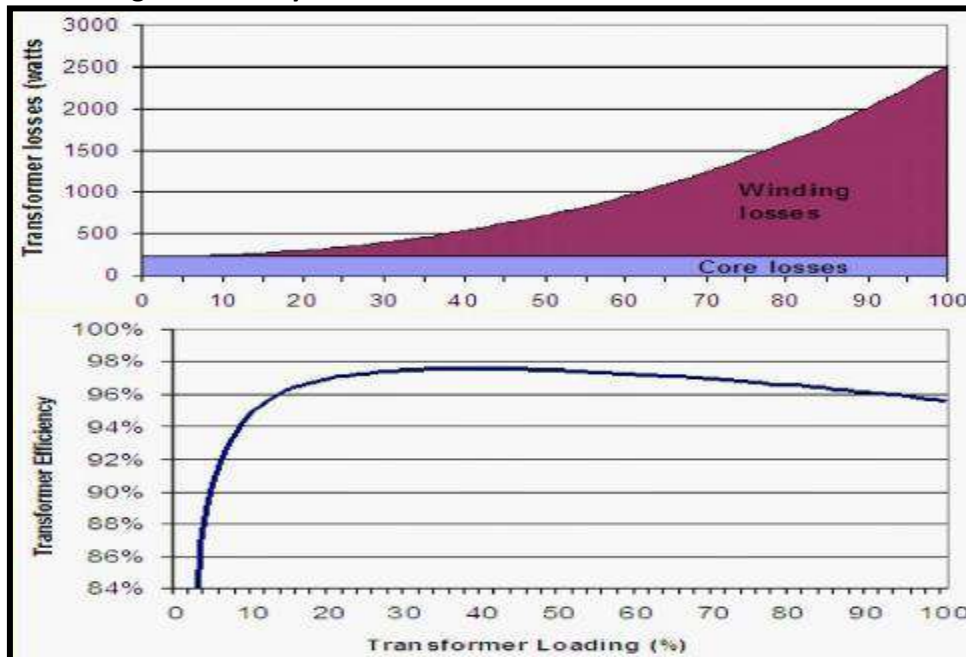
Parameter	Unit	Value
Average power consumption of the ceiling fan at present	Watt	60
Average power consumption of energy efficient star rated (BLDC) fans	Watt	28
Equivalent Power saving per fan	Watt	32
Numbers of fans to be replaced	Nos	1000
Working Hours Per annum	Hr	5500
Overall electric Power Cost	Rs/KWH	4.70
Annual Energy Saving	KWH	176000
Monetary saving	Rs/Year	827200
Investment	Rs	2600000
Payback	Month	37.72

5.0 Observation and analysis

5.1 Transformer loading

The efficiency of the transformers not only depends on the design but also, on the effective operating load. The variable losses depend on the effective operating load on the transformer. The maximum efficiency of the transformer occurs at a condition when the constant loss is equal to variable loss. For distribution transformers, the core loss is 15 to 20% of full load copper loss. Hence, the maximum efficiency of the distribution transformers occurs at a loading between 40 – 60%. For power transformers, the core loss is 25 to 30% of full load copper loss. Hence, the maximum efficiency of the power transformers occurs at a loading between 40 – 60%.

Transformer loading Vs Efficiency



All the electrical parameters required evaluating percentage loading & losses of Transformers were recorded for old building transformer.

No load and full load losses of the transformer are obtained from standards to calculate the transformer losses same is as follows.

Table 6. Transformer loading

Description	Transformer Capacity	No-load loss	Full load loss	Power factor	Maximum Apparent power	Average Apparent Power	Max Loading	Average Loading	Total loss
	kVA	kW	kW	PF	kVA	kVA	%	%	kW
TR1	1500	2.6	19.8	0.997	857.8	523.8	57%	35%	9.08

Note: Total loss = No load loss+ Full load loss*(% Loading ²)

5.2 Capacitors & power factor

A good capacitor should deliver about 1.3 to 1.2 times current as compared to its rating in kVAr. Hence, a 25 kVAr capacitor should deliver about 32 amps to 30 amps in all the three phases at about 440 volts. If the output falls less than 80% of the rated capacity or there is considerable unbalance of current between the phases, such capacitors may be replaced with new capacitors.

The damaged capacitors can act as a burden on the management rather than delivering the desired good output. It would be beneficial to examine all the installed capacitors for its output current in all the three phases at least once in 15 days and all the derated and damaged capacitors should be replaced with new ones.

Towards monitoring the health of the capacitors operating voltage and current of each phase of the capacitors have been monitored. The capacitor current is slightly higher than the rated current.

The capacitors without reactors is not recommended in systems polluted with harmonics as plain capacitors offer low impedance path for harmonic currents thereby overloading it with harmonic currents causing excessive heating and leading to premature failure of capacitors and switchgears. Capacitors also cause resonance in the circuit causing amplification of harmonic.

Ideally capacitor voltage rating is to match the supply voltage. If the supply voltage is lower, the reactive power kVAr produced will be the ratio V_1^2/V_2^2 where V_1 is the actual voltage and V_2 is the Rated Voltage.

On the other hand, if the supply voltage exceeds rated voltage, the life of the capacitor is adversely affected.

Measurement for capacitor banks were made for all the locations in the plant during energy audit. The results are tabulated below:

Table 7. Capacitor Bank-300 KVAR

Capacitor Bank-300 KVAR (LT Panel)							
Capacitor Sr. No.	Rating in kVAR	Rated Current (in A)	Voltage Rating (in V)	Current (in A)			Status
				R	Y	B	
1	25	32.8	440	32.20	32.40	32.50	OK
2	25	32.8	440	31.80	31.90	32.10	OK
3	25	32.8	440	32.20	32.10	32.30	OK
4	25	32.8	440	32.10	32.50	32.70	OK
5	25	32.8	440	32.20	32.30	32.32	OK
6	25	32.8	440	31.60	31.50	31.80	OK
7	25	32.8	440	32.10	32.10	32.67	OK
8	25	32.8	440	32.80	32.40	32.90	OK

5.3 Lighting system

Plant already implemented energy efficient measures in lighting area at different places. Most of the conventional lamps are replaced by LED Lamps.

5.3.1 AREA WISE LUX LEVEL

Lux is measured during the audit and listed below.

Sr. No	Location	Lux	
		Min	Max
1	THANK YOU GATE	235	265
2	COLLEGE MAIN GATE	250	275
3	PARKING AREA	215	245
GROUND FLOOR			
4	AMPHITHEATER(AUDITORIUM)	255	275
5	RECEPTION	205	230
6	ADMINISTRATION OFFICE	260	285
7	REGISTRAR OFFICE	245	280
8	MEETING ROOM	240	268
9	HR OFFICE	245	275
10	LEARNING RESOURCE CENTRE(LRC)	255	280
11	COMPUTER LABS CL-7, CL-8	230	255
12	CLASS ROOMS CR-3, CR-4	240	275
13	LECTURE THEATERS LT-1, LT-2	210	240
FIRST FLOOR			
14	COMPUTER LABS CL-9, CL-10, CL-11	265	285
15	TUTORIAL ROOMS TR-1, TR-2, TR-3, TR4	230	265
16	FACULTY (HSS, IT, CSE)	255	275
17	CLASS ROOMS CR-5, CR-6, CR-7, CR-8, CR-9, CR-10	220	245

Sr. No	Location	Lux	
		Min	Max
18	LECTURE THEATERS LT-3	225	250
19	PANTRY	240	275
20	BOARD ROOM	265	280
21	ECE LAB-6	255	275
22	PHYSICS LAB-1	245	280
SECOND FLOOR			
23	GENOMIC TECHNOLOGIES LAB	240	275
24	CLASS ROOMS CR-11, CR-12	260	285
25	DIRECTOR'S & DEAN (A&R) OFFICE	265	285
26	COMPUTER LAB CL-1	230	265
27	U.G. BIOTECH LAB-4	240	275
28	TUTORIAL ROOMS TR-5, TR-6, TR-7	265	280
29	FACULTY (ECE, BT&BI, PMS, MATH, HSS)	255	275
30	VICE CHANCELLOR'S OFFICE	245	280
31	PRO CHANCELLOR'S OFFICE	230	265
32	BIOINFORMATICS LAB	265	285
33	ECE LABS-3,4,5	230	265
34	CHARACTERIZATION LAB	265	280
THIRD FLOOR			
35	EM. ANALYSIS LAB	245	280
36	PROBIOTICS AND GUT SIMULATION LAB	255	275
37	PHYSICS LAB-2	265	285
38	PG. BIOTECH LAB	230	265
39	RESEARCH LAB ECE, CSE, BI, e-YANTRA, IOT	260	285
40	SERVER ROOMS	245	280
41	LANGUAGE LAB	240	268
42	C.V.D.LAB	245	275
43	U.G. BIOTECH LAB-3	255	280
44	FACULTY (BT&BI)	230	255
45	ECE LABS-1, 2, 7	265	280
46	P.G. LAB	210	240
47	COMPUTER LABS CL-3, CL-4, CL-5, CL-6, CL-12	240	275
48	MATERIAL SCIENCE LAB	265	280
49	GROUP DISCUSSION ROOM	255	275
FOURTH FLOOR			
50	BIOTECH LABS	260	285
51	CLASS ROOMS 16, 17, 18, 19	265	285
LOWER LEVEL-1			

Sr. No	Location	Lux	
		Min	Max
52	ACCOUNT & FINANCE	230	265
53	CLASS ROOMS CR-1, CR-2	265	280
54	CONTROLLER OF EXAMINATION	255	275
LOWER LEVEL -2			
55	WATER FILTER ROOM	265	285
56	RECORD ROOM	230	265
57	TELEPHONE EXCHANGE	265	280
58	TUCK SHOP	255	275
LOWER LEVEL-3			
59	IPR CELL	245	275
60	TIED CELL	255	280
61	PANJAB NATIONAL BANK	230	255

5.3.2 List of LED

Jaypee University of Information Technology, Wagnaghat LED Light Details: -				
Sr	Building Name	Tube Rod Light (20/18/10Watt).Approx	LED Bulb(9/5Watt)Approx	Remark
1	Academic Block Area	1816	400	
2	Civil Area with ESS & Laundry	242	4	
3	Mess, Annapurna(20/18W)	196	15	
4	Hostels(H1-H-15)	1630	1900	
5	Hospital, Temple, SOR, Telephone Exchange	124	115	
6	Family Accommodation (A, B, C, D, E)	335	200	
	Total Qty.	4343	2634	

OBSERVATIONS

It was observed that the building has opted for the Energy-efficient lighting system i.e., LED which a was good option to save energy and we personally felt good to observe it and checked whether the lux level we are getting is sufficient or not and was observed that the lux level was good.

It was observed that the lux level in some of the areas is within limits and in some areas, it is a bit more.

RECOMMENDATION

LED lights are highly recommended as they are the best in technology available in the illumination market and will provide a good amount of energy and monetary savings since major lighting

includes halogens which are the most inefficient light in the market. So please go for the led lights for the areas where it is still remaining to go for 100% LED lightings.

LED also helps in heat load reduction since the heat dissipated by the halogens is much higher than the heat dissipated by LED lights thus intangible savings by reduction in cooling can be easily be achieved. Also, we recommend not using GLS Bulbs as they are inefficient lights and also dissipate heat increase HVAC load.

It is recommended to install a photo sensor for all the outdoor light and also in the working floor near to the glasses envelope in the building.

It is recommended to install occupancy sensors in Stores/office cabins and toilets to save energy.

It is recommended to install the daylight sensor on the outdoor lights for automation and control of the lights and this will also help us reduce the unwanted running hours of the lights.

5.4 Sound dB Monitoring

Sound dB monitored at **JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY** site and details as under.

Sr. No	Location	Sound DB	
		Min	Max
1	THANK YOU GATE	48	54
2	COLLEGE MAIN GATE	52	54
3	PARKING AREA	48	52
GROUND FLOOR			
4	AMPHITHEATER(AUDITORIUM)	47	53
5	RECEPTION	49	51
6	ADMINISTRATION OFFICE	46	52
7	REGISTRAR OFFICE	45	50
8	MEETING ROOM	45	52
9	HR OFFICE	50	54
10	LEARNING RESOURCE CENTRE(LRC)	47	52
11	COMPUTER LABS CL-7, CL-8	52	55
12	CLASS ROOMS CR-3, CR-4	49	52
13	LECTURE THEATERS LT-1, LT-2	46	48
FIRST FLOOR			
14	COMPUTER LABS CL-9, CL-10, CL-11	52	54
15	TUTORIAL ROOMS TR-1, TR-2, TR-3,TR4	48	55
16	FACULTY (HSS, IT, CSE)	49	54
17	CLASS ROOMS CR-5, CR-6, CR-7, CR-8, CR-9, CR-10	48	51

Sr. No	Location	Sound DB	
		Min	Max
18	LECTURE THEATERS LT-3	50	53
19	PANTRY	49	52
20	BOARD ROOM	47	55
21	ECE LAB-6	49	54
22	PHYSICS LAB-1	45	50
SECOND FLOOR			
23	GENOMIC TECHNOLOGIES LAB	49	52
24	CLASS ROOMS CR-11, CR-12	46	52
25	DIRECTOR'S & DEAN (A&R) OFFICE	52	54
26	COMPUTER LAB CL-1	48	55
27	U.G. BIOTECH LAB-4	49	52
28	TUTORIAL ROOMS TR-5, TR-6, TR-7	47	55
29	FACULTY (ECE, BT&BI, PMS, MATH, HSS)	49	54
30	VICE CHANCELLOR'S OFFICE	45	50
31	PRO CHANCELLOR'S OFFICE	48	55
32	BIOINFORMATICS LAB	52	54
33	ECE LABS-3,4,5	48	55
34	CHARACTERIZATION LAB	47	55
THIRD FLOOR			
35	EM. ANALYSIS LAB	45	50
36	PROBIOTICS AND GUT SIMULATION LAB	47	53
37	PHYSICS LAB-2	52	54
38	PG. BIOTECH LAB	48	55
39	RESEARCH LAB ECE, CSE, BI, e-YANTRA, IOT	46	52
40	SERVER ROOMS	45	50
41	LANGUAGE LAB	45	52
42	C.V.D.LAB	50	54
43	U.G. BIOTECH LAB-3	47	52
44	FACULTY (BT&BI)	52	55
45	ECE LABS-1, 2, 7	47	55
46	P.G.LAB	46	48
47	COMPUTER LABS CL-3, CL-4, CL-5, CL-6, CL-12	49	52
48	MATERIAL SCIENCE LAB	47	55
49	GROUP DISCUSSION ROOM	49	54
FOURTH FLOOR			
50	BIOTECH LABS	46	52
51	CLASS ROOMS 16, 17, 18, 19	52	54
LOWER LEVEL-1			

Sr. No	Location	Sound DB	
		Min	Max
52	ACCOUNT & FINANCE	48	55
53	CLASS ROOMS CR-1, CR-2	47	55
54	CONTROLLER OF EXAMINATION	49	54
LOWER LEVEL -2			
55	WATER FILTER ROOM	52	54
56	RECORD ROOM	48	55
57	TELEPHONE EXCHANGE	47	55
58	TUCK SHOP	49	54
LOWER LEVEL-3			
59	IPR CELL	50	54
60	TIED CELL	47	52
61	PANJAB NATIONAL BANK	52	55

**Recommended sound level as set in CPCB-Environmental Standards- Noise (ambient standards)
dB (A)**

SCHEDULE

(see rule 3(1) and 4(1))

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

- Note:-
1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
 2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
 3. Silence zone is an area comprising not less than 100 metres around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority
 4. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

* dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

5.5 List of Assets & Electrical Equipment's

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT					
Electrical Items List					
Sl.	Item Name	Item Description	Unit	Total Qty.	Remark
I) Electrical Sub- Station					
1	Distribution Transformer	1500KVA, 11/.440, ONAN Type, Dyn11, Current HV Side - 78.73A, LV Side- 2000A, Oil capacity - 1350 Ltr, Sr. No. 5041 & 5042, Make- Pan Electro Technic, Manufacturing Year- 2006	No.	2	
2	DG Set- AC Generator	750 KVA, Type HC163441 Ref No.- N17A030739, , Phase- 3 RPM- 1500, Voltage- 415, Aps-1250, Make- Stamford	No.	1	
3	DG Set- Engine	Model- KTA 38- G13, Sr. No.- 25423921, Mfg. date-2017, Make- Cummins	No.	1	
4	DG Set- AC Generator	750 KVA, Type HC163441 Ref No.- N17A02064, , Phase- 3 RPM- 1500, Voltage- 415, Aps-1250, Make- Stamford	No.	1	
5	DG Set- Engine	Model- KTA 38- G13, Sr. No.- 25423920, Mfg. date-2017, Make- Cummins	No.	1	
6	DG Set	50 KVA, Engine model- S308G6, Product Model- JSPF 50, Engine Sr. No.- 110632034, Make- Jakson, MFG- 2011	No.	1	
7	HT Panel	11KV, 3feeder (1 incomer + 2 Outgoing), Enclosure, Type- VMX, Rated Amp- 400A, SER No.- 8231012/1-3, CT Ratio - 200/5A, Mfg.- 2002, Make-Alstrom	Set	1	
8	LT Panel- Normal Supply	ACB- 2500A, Type- CN-CS-2500C, Volt- 415, ACB Make- L& T, Panel - Advance Electro Control System Pvt. Ltd.	Set	1	
9	LT Panel - Emergency Supply	ACB- 1600A, Type- CN-CS-1600C, Volt- 415, ACB Make- L& T, Panel - Advance Electro Control System Pvt. Ltd.	Set	1	
10	Capacitor panel	25KVAR- 8 Step, Voltage- 415, Make- Advance Electro Control System	Set	1	
11	DG Air Cooling Motor	KW/ HP- 15/11, RPM- 1455, A-22, Voltage- 415, Make- ABB	No.	2	
12	DG Exhaust Motor	KW/ HP- 15/11, RPM- 1455, A-22, Voltage- 415, Make- ABB	No.	2	

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Electrical Items List

Sl.	Item Name	Item Description	Unit	Total Qty.	Remark
13	Boiler Room for water pumping	KW/ HP- 15/20, RPM- 1450, A-28, Voltage- 415, Make- ABB	No.	2	
14	Diesel Motor for Boiler	KW/ HP- 0.75/1, RPM- 910, Voltage- 415, Type- PAA62-258, Make- Kirloskar	No.	1	
15	Air Blower	5HP, 415V	No.	1	
II) Plant Room					
1	Motor (Use for firefighting Pump)	KW/HP- 45/60, RPM- 2955, Ampere- 75A, Voltage -415, Make- ABB	No.	1	
2	Motor (Use for firefighting Pump)	KW/HP- 5/ 7.5, RPM- 2875, Ampere- 10.5A, Voltage- 415, Make- ABB	No.	1	
3	Diesel Pump (Use for firefighting Pump)	Head - 55M, Discharge- 171lpm, Type- CE 100/32, Make- Kirloskar	No.	1	
4	Motor/ Pump	KW/ HP- 7.5/10, RPM-2900, Voltage- 415, 3 phase, Type- KDS- 1050+, Size- 65 X 65mm, Imp. Dia- 191mm, Head- 32- 49, Make- Kirloskar	No.	3	
5	Motor / Pump	KW/ HP- 2.2/3, RPM-2840, Voltage- 415, 3 phase, Type- KDS- 335++, Size- 50X 40mm, Imp. Dia- 165mm, Head- 22- 33, Make- Kirloskar	No.	4	
III) Laundry Area					
1	Washing M/C	Washing Machine-Model- WME -15	No.	1	
2	Dryer M/C	Cloth Dryer M/C- HX-25	No.	1	
3	Washing M/C	Washing Machine-Model- LXS 25	No.	1	
4	Dryer M/C	Cloth Dryer M/C- HX-15	No.	2	
5	Dryer M/C	Dryer Model DRE-15, 490 Kg	No.	1	
6	Dryer M/C	Dryer Model DRS-30, 570 Kg	No.	2	
7	Drycleaner	Drycleaner Model DMX15, 950 Kg	No.	1	
8	Press Machine	Press Machine Model-DRS-12	No.	1	
9	Electric Overhead Traveling Crane	10 Ton	No.	1	
10	Air Compressor	1420 RPM, 3 HP	No.	1	
11	Boiler	Steam boiler make heat capacity 800 Kg/hr.	No.	2	

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Electrical Items List

Sl.	Item Name	Item Description	Unit	Total Qty.	Remark
12	Hot air boiler	Capacity 10,00000 kL/hr.	No.	1	
13	Dryer	DRE 30, 30kg, 26kW, 415V	No.	1	
14	Washing M/C	LE 30, 30kg, 19kW, 415V	No.	1	
IV) Hostels Calorifier					
1	Calorifier	Capacity- 600 Ltr	No.	27	
2	Calorifier	Capacity-800 Ltr	No.	28	
3	Calorifier	capacity-1000 Ltr	No.	6	
4	Pump	1HP, 415V, Make-Kirloskar	No.	16	
V) Annapurna & Cafeteria					
1	Cold system for garbage		No.	1	
2	Cold Store		No.	2	
3	Water Cooler		No.	6	
4	Ceiling Fan		No.	68	
5	Water Dispenser		No.	5	
VI) STP Area					
1	Collage Pump	Type- SP-OM, Head 6.5-13, Volt-415, KW-0.75/1HP, RPM 2700, Make-Kirloskar	No.	3	
2	Horticulture Pump	Type- KP-1388+, Head 75.5M, Volt-415, RPM 2900, KW-9.3/12.5HP, Make-Kirloskar	No.	2	
3	Filter Pump	Type-KDS-538, Head-30M, RPM-2870, KW-3.5/5HP, Volt-415, Make-Kirloskar	No.	2	
4	Air Blower	Model- M5075, Capacity-90CPM, Speed-1070 RPM, Pressure- 6 PSI, Make- Everest Blower, Motor- 5.5 KW, 415 Volts, Make- Kirloskar	No.	4	
5	Sewage Pump	HP-7.5, 415 Volts, Make- Ground Force	No.	6	
VII) Academic Block					

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Electrical Items List

Sl.	Item Name	Item Description	Unit	Total Qty.	Remark
1	Ceiling Fan	60Watt, 240 volt	No.	609	
2	Split AC	1.8 Ton	No.	23	
3	Window AC	1.5 Ton	No.	5	
5	Wall Fan		No.	15	
6	Industrial AC	4 Ton	No.	1	
7	Industrial AC	8 Ton	No.	1	
8	Pump	Centrifugal, 3HP, 415V	No.	1	
9	Water Cooler		No.	6	
10	Passenger Lift	Machine No. MM0711	No.	1	
11	Water Dispenser		No.	1	1 New Install
VIII) Civil Engineering Area					
1	Ceiling Fan	60Watt, 240 volt	No.	88	
2	Water Dispenser		No.	1	1 New Install
3	Water Cooler		No.	1	
IX) SOR					
1	Ceiling Fan	60Watt, 240 volt	No.	30	
2	Split AC	1.8 Ton	No.	13	
3	Standing AC	3.3 Ton	No.	1	
4	AC- Window	2 Ton	No.	1	
X) Dormitory & JAL Mess					
1	Ceiling Fan	60Watt, 240 volt	No.	51	
2	Water Cooler		No.	1	
XI) Hostel = H1- H15					
1	Ceiling Fan	60Watt, 240 volt	No.	953	
3	Water Cooler		No.	15	
4	Passenger Lift	Machine No. P03767	No.	1	
5	Water Dispenser		No.	6	
6	Field Coil Unit	30W, 750 RPM, 240V	No.	970	

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT					
Electrical Items List					
Sl.	Item Name	Item Description	Unit	Total Qty.	Remark
XII) Exchange Block, Dispensary, Store, Security Main Gate					
1	Ceiling Fan	60Watt, 240 volt	No.	34	
3	Water Dispenser (Dispensary)		No.	1	
XIII) Malavya Bhawan (A, B, C, D, E)					
1	Ceiling Fan	60Watt, 240 volt	No.	362	
XIV) Security Check posts					
1	Ceiling Fan	60Watt, 240 volt	No.	5	

6.0 CHECKLIST & TIPS FOR ENERGY EFFICIENCY IN ELECTRICAL UTILITIES

- Optimise the tariff structure with utility supplier
- Schedule your operations to maintain a high load factor
- Shift loads to off-peak times if possible.
- Minimise maximum demand by tripping loads through a demand controller
- Stagger start-up times for equipment with large starting currents to minimize load peaking.
- Use standby electric generation equipment for on-peak high load periods.
- Correct power factor to at least 0.90 under rated load conditions.
- Relocate transformers close to main loads.
- Set transformer taps to optimum settings.
- Disconnect primary power to transformers that do not serve any active loads
- Consider on-site electric generation or cogeneration.
- Export power to grid if you have any surplus in your captive generation
- Check utility electric meter with your own meter.
- Shut off unnecessary computers, printers, and copiers at night

Motors

- Properly size to the load for optimum efficiency. (High efficiency motors offer of 4 - 5% higher efficiency than standard motors)
- Use energy-efficient motors where economical.
- Use synchronous motors to improve power factor.
- Check alignment.
- Provide proper ventilation (For every 10oC increase in motor operating temperature over recommended peak, the motor life is estimated to be halved)
- Check for under-voltage and over-voltage conditions.
 - Balance the three-phase power supply. (An Imbalanced voltage can reduce 3 - 5% in motor input power)
 - Demand efficiency restoration after motor rewinding. (If rewinding is not done properly, the efficiency can be reduced by 5 - 8%)

Drives

- Use variable-speed drives for large variable loads.
- Use high-efficiency gear sets.
- Use precision alignment.
- Check belt tension regularly.
- Eliminate variable-pitch pulleys.

- Use flat belts as alternatives to v-belts.
- Use synthetic lubricants for large gearboxes.
- Eliminate eddy current couplings.
- Shut them off when not needed

Fans

- Use smooth, well-rounded air inlet cones for fan air intakes.
- Avoid poor flow distribution at the fan inlet.
- Minimize fan inlet and outlet obstructions.
- Clean screens, filters, and fan blades regularly.
- Use aerofoil-shaped fan blades.
- Minimize fan speed.
- Use low-slip or flat belts.
- Check belt tension regularly.
- Eliminate variable pitch pulleys.
- Use variable speed drives for large variable fan loads.
- Use energy-efficient motors for continuous or near-continuous operation
- Eliminate leaks in ductwork.
- Minimise bends in ductwork
- Turn fans off when not needed
- Use smooth, well-rounded air inlet ducts or cones for air intakes.
- Minimize blower inlet and outlet obstructions.
- Clean screens and filters regularly.
- Minimize blower speed.
- Use low-slip or no-slip belts.
- Check belt tension regularly.
- Eliminate variable pitch pulleys.
- Use variable speed drives for large variable blower loads.
- Use energy-efficient motors for continuous or near-continuous operation.
- Eliminate ductwork leaks.
- Turn blowers off when they are not needed.

Pumps

- Operate pumping near best efficiency point.
- Modify pumping to minimize throttling.
- Adapt to wide load variation with variable speed drives or sequenced control of smaller units.

- Stop running both pumps -- add an auto-start for an on-line spare or add a booster pump in the problem area.
- Balance the system to minimize flows and reduce pump power requirements.
- Use siphon effect to advantage: don't waste pumping head with a free-fall (gravity) returnmall loads requiring higher pressures.
- Increase fluid temperature differentials to reduce pumping rates.
- Repair seals and packing to minimize water waste.

HVAC (Heating / Ventilation / Air Conditioning)

- Tune up the HVAC control system.
- Consider installing a building automation system (BAS) or energy management system (EMS) or restoring an out-of-service one.
- Balance the system to minimize flows and reduce blower/fan/pump power requirements.
- Eliminate or reduce reheat whenever possible.
- Use appropriate HVAC thermostat setback.
- Use morning pre-cooling in summer and pre-heating in winter (i.e. -- before electrical peak hours).
- Use building thermal lag to minimize HVAC equipment operating time.
- In winter during unoccupied periods, allow temperatures to fall as low as possible without freezing water lines or damaging stored materials.
- In summer during unoccupied periods, allow temperatures to rise as high as possible without damaging stored materials.
- Improve control and utilization of outside air.
- Use air-to-air heat exchangers to reduce energy requirements for heating and cooling of outside air.
- Reduce HVAC system operating hours (e.g. -- night, weekend).
- Optimize ventilation.
- Ventilate only when necessary. To allow some areas to be shut down when unoccupied, install dedicated HVAC systems on continuous loads (e.g. -- computer rooms).
- Provide dedicated outside air supply to kitchens, cleaning rooms, combustion equipment, etc. to avoid excessive exhausting of conditioned air.
- Use evaporative cooling in dry climates.
- Reduce humidification or dehumidification during unoccupied periods.
- Use atomization rather than steam for humidification where possible.
- Clean HVAC unit coils periodically and comb mashed fins.
- Upgrade filter banks to reduce pressure drop and thus lower fan power requirements.

- Check HVAC filters on a schedule (at least monthly) and clean/change if appropriate.
- Check pneumatic controls air compressors for proper operation, cycling, and maintenance.
- Isolate air conditioned loading dock areas and cool storage areas using high-speed doors or clear PVC strip curtains.
- Install ceiling fans to minimize thermal stratification in high-bay areas.
- Relocate air diffusers to optimum heights in areas with high ceilings.
- Consider reducing ceiling heights.
- Eliminate obstructions in front of radiators, baseboard heaters, etc.
- Check reflectors on infrared heaters for cleanliness and proper beam direction.
- Use professionally-designed industrial ventilation hoods for dust and vapor control.
- Use local infrared heat for personnel rather than heating the entire area.
- Use spot cooling and heating (e.g. -- use ceiling fans for personnel rather than cooling the entire area).
- Purchase only high-efficiency models for HVAC window units.
- Put HVAC window units on timer control.
- Don't oversize cooling units. (Oversized units will "short cycle" which results in poor humidity control.)
- Install multi-fueling capability and run with the cheapest fuel available at the time.
- Consider dedicated make-up air for exhaust hoods. (Why exhaust the air conditioning or heat if you don't need to?)
- Minimize HVAC fan speeds.
- Consider desiccant drying of outside air to reduce cooling requirements in humid climates.
- Consider ground source heat pumps.
- Seal leaky HVAC ductwork.
- Seal all leaks around coils.
- Repair loose or damaged flexible connections (including those under air handling units).
- Eliminate simultaneous heating and cooling during seasonal transition periods.
- Zone HVAC air and water systems to minimize energy use.
- Inspect, clean, lubricate, and adjust damper blades and linkages.
- Establish an HVAC efficiency-maintenance program. Start with an energy audit and follow-up, then make an HVAC efficiency-maintenance program a part of your continuous energy management program.

Compressors

- Consider variable speed drive for variable load on positive displacement compressors.



- Use a synthetic lubricant if the compressor manufacturer permits it.
- Be sure lubricating oil temperature is not too high (oil degradation and lowered viscosity) and not too low (condensation contamination).
- Change the oil filter regularly. • Periodically inspect compressor intercoolers for proper functioning.
- Use waste heat from a very large compressor to power an absorption chiller or preheat process or utility feeds.
- Establish a compressor efficiency-maintenance program. Start with an energy audit and follow-up, then make a compressor efficiency-maintenance program a part of your continuous energy management program.

Compressed air

- Install a control system to coordinate multiple air compressors.
- Study part-load characteristics and cycling costs to determine the most-efficient mode for operating multiple air compressors.
- Avoid over sizing -- match the connected load.
- Load up modulation-controlled air compressors. (They use almost as much power at partial load as at full load.)
- Turn off the back-up air compressor until it is needed.
- Reduce air compressor discharge pressure to the lowest acceptable setting. (Reduction of 1 kg/cm² air pressure (8 kg/cm² to 7 kg/cm²) would result in 9% input power savings. This will also reduce compressed air leakage rates by 10%)
- Use the highest reasonable dryer dew point settings.
- Turn off refrigerated and heated air dryers when the air compressors are off.
- Use a control system to minimize heatless desiccant dryer purging.
- Minimize purges, leaks, excessive pressure drops, and condensation accumulation. (Compressed air leak from 1 mm hole size at 7 kg/cm² pressure would mean power loss equivalent to 0.5 kW)
- Use drain controls instead of continuous air bleeds through the drains.
- Consider engine-driven or steam-driven air compression to reduce electrical demand charges.
- Replace standard v-belts with high-efficiency flat belts as the old v-belts wear out.
- Use a small air compressor when major production load is off.
- Take air compressor intake air from the coolest (but not air conditioned) location. (Every 50C reduction in intake air temperature would result in 1% reduction in compressor power consumption) • Use an air-cooled aftercooler to heat building makeup air in winter.
- Be sure that heat exchangers are not fouled (e.g. -- with oil).



- Be sure that air/oil separators are not fouled.
- Monitor pressure drops across suction and discharge filters and clean or replace filters promptly upon alarm.
- Use a properly sized compressed air storage receiver. Minimize disposal costs by using lubricant that is fully demulsible and an effective oil-water separator.
- Consider alternatives to compressed air such as blowers for cooling, hydraulic rather than air cylinders, electric rather than air actuators, and electronic rather than pneumatic controls.
- Use nozzles or venturi-type devices rather than blowing with open compressed air lines.
- Check for leaking drain valves on compressed air filter/regulator sets. Certain rubber-type valves may leak continuously after they age and crack.
- In dusty environments, control packaging lines with high-intensity photocell units instead of standard units with continuous air purging of lenses and reflectors.
- Establish a compressed air efficiency-maintenance program. Start with an energy audit and followup, then make a compressed air efficiency-maintenance program a part of your continuous energy management program.

Regn No. EA-19771	 National Productivity Council	Certificate No. 8890
National Productivity Council (National Certifying Agency) <u>PROVISIONAL CERTIFICATE</u>		
<p><i>This is to certify that Mr./Mrs./Ms.Deepak.....</i></p> <p><i>son / daughter of Mr....Vineet Kumar.....</i></p> <p><i>has passed the National certification Examination for Energy Auditors held in September - 2016, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India.</i></p> <p><i>He / She is qualified as Certified Energy Manager as well as Certified Energy Auditor.</i></p> <p><i>He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for the Accredited Energy Auditor and issue of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.</i></p> <p><i>This certificate is valid till the issuance of an official certificate by the Bureau of Energy Efficiency.</i></p>		
Place : Chennai, India		 Controller of Examination
Date : 10 th March, 2017		

005968



The Institution of Engineers (India)

By virtue of Qualification, Professional
training and Corporate Membership
of this Institution

DEEPAK

OF

MECHANICAL ENGINEERING DIVISION

is hereby authorised to use the style and title of

Chartered Engineer [India]



AM1517557

Bhattacharya

THANKS



ENVIRONMENT AUDIT REPORT

MAY 2022



**Jaypee University of Information Technology
Waknagat, P.O. Waknaghat, Teh Kandaghat, Distt.
Solan pin-173234 (H.P), India**

Audit Conducted by:



ENGINEERING FACILITY SERVICES

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2 ACKNOWLEDGEMENT

EFS Engineering Facility Services acknowledges the cooperation and support of the management and staff of **Jaypee University of Information Technology**, in particular, the support and disposition of the **Mr. A.P. Khare (Senior Project Engineer,)**, **Mr. jasveer Singh (Engineer Electrical Department) & Mr. Manoj Kumar Sharma (Deputy Chief Engineer, civi)** Teaching/Supporting Staff of institute has been invaluable to the success of this report. EFS Engineering Facility Services wishes to stress that in line with its policy, all information obtained in the course of this Audit exercise, as well as those contained in this report, will be accorded the strictest confidentiality.

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The Vice Chancellor

Jaypee University Of Information Technology

Report by: (Deepak Bajpai) Lead Auditor

(Certified Energy Auditor and Chartered Engineer)

4 INTRODUCTION

Environment Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Environment audit can be a useful tool for a college to determine how and where they are using the most energy or water or resources; the college can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

5 OVERVIEW OF INSTITUTE

Genesis and Accreditations

- The JUIT was conceived by a joint vision of the Govt of Himachal Pradesh and the Founder Chairman of Jaypee Group Shri JaiPrakash Gaur in 2000. Land was provided on lease by the State Govt and the university was established by Act No 14 of 2002 vide Extraordinary Gazette Notification of the Govt of Himachal Pradesh dated May 23, 2002. The University Grants Commission accorded its approval under Section 2(f) of the UGC Act vide their Letter No. F 9-10/2002(CPP-1) dated 09 Dec 2002. The JUIT is also a member of the Association of Indian Universities (AIU).
- The academic activities of JUIT commenced from July 2002 and currently offering undergraduate B. Tech degree programs in Bioinformatics, Biotechnology, Civil Engineering, Computer Science & Engineering, Electronics & Communication Engineering, Electronics & Computer Engineering and Information Technology.
- Besides B. Tech programs, the university is presently offering M. Tech in Biotechnology, Biotechnology with specialization in Industrial Biotechnology and Medical Biotechnology, Civil Engineering with specialization in Structural Engineering, Construction Management and Environmental Engineering, Computer Science and Engineering, Computer Science and Engineering with specialization in Information Security and Data Science, Electronics and Communication Engineering, Electronics and Communication Engineering with specialization in Internet of Things. M Sc Programs are offered in Biotechnology, and Microbiology.
- Doctoral Phd is offered in Biotechnology, Bioinformatics, Civil Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Humanities and Social Sciences, Mathematics, Physics and Materials Science.
- The University has been twice accredited by NAAC (2011 and 2017).

The Campus

- The University campus is spread over 25 acres of lush green picturesque slopes of Wagnaghat hills in the Solan District of Himachal Pradesh. The smart campus is pollution free and enjoys lovely weather throughout the year. The maximum summer temperatures touch 32 to 35 degrees

centigrade for one month in a year. The world class infrastructure has been beautifully designed by M/S Arcop Associates Pvt. Ltd. an eminent Montreal based Canadian architect firm

- The infrastructure was built in a phased manner and as of today the JUIT has a built up area of 74228.71 sq m. It encompasses an Academic Block with spacious Auditorium, Lecture Theatres, Classrooms, Tutorial rooms, Laboratories, Administrative Offices, Faculty Offices and Library. The second terrace of the hill has all the hostels, Students Mess, Guestrooms, Helipad, Outdoor sports facilities and Dispensary. The lower terrace of the hill contains the Civil Engineering Dept., Faculty residences, Temple, Laundry facilities and Stores. The entire campus is wifi enabled.

LEARNER CENTRIC EDUCATION PROCESS

JUIT Waknaghat offers a challenging academic environment to its students. It aims to instill the habit of life-long learning and therefore, provides a learner-centric rather than a teacher-centric educational process. The system has been designed to provide students the freedom to learn what they want to learn at a pace determined by them. Post-graduate students are encouraged to develop independence in thought and action as well as the ability to develop solutions that fit problem requirements. These students are trained to acquire the capability to deploy appropriate technology paradigms for given tasks, explore new technology, and lead teams to solve complex problems.

6 OBJECTIVES

The Environment Audit of an institution is of paramount importance these days for self-assessment of the institution, reflecting the role of the institution in mitigating the present environmental problems. The college has been putting efforts to keep the environment clean since its inception. But the auditing of this non-scholastic effort of the college has not been documented. Therefore, the purpose of the present environment audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Environment Audit is to:

1. Document the quality drinking water
2. Document the quality of recycled waste water for gardening
3. Document the solid Waste disposal system of medical and non-medical waste
4. To document the ambient environmental condition of air, water and noise in the campus.
5. Benchmarking for environmental protection initiatives
6. Reduction in resource use of water, electricity etc.
7. Financial savings through a reduction in resource use as electricity, water, waste, fuel, etc.

7 AUDIT TEAM

Audit was conducted by the EFS team:

Name	Position	Qualification
Deepak Bajpai	Lead Auditor	B.Tech (Mechanical Engineering) Bureau of Energy Efficiency Certified Energy Auditor, Chartered Engineer
Gaurav Pratap Singh	Auditor	B. Tech
Vikrant Pal	Auditor	B. Tech
Rajat Katiyar	Auditor	B. Tech

8 EXECUTIVE SUMMARY

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance.

This is an environmental audit of the institute for NAAC affiliation; QS Programme and doing their bid towards environmental protection and environmental awareness at the local and global front. The audit criterion is environmental cognizance, waste minimization and management, biodiversity conservation, water conservation, energy conservation, and environmental legislative compliance by the campus. A questionnaire is used during the audit. This audit report contains observations and recommendations for the improvement of environmental consciousness.

9 AREA OF IMPROVEMENTS

- Water meters should be installed and maintain the inventory of water resources.
- The water from the rainwater harvesting pit can be used for the purpose of gardening.
- An internal inspection system should be developed for various equipment available in the campus.
- Environmental drills for response against spillages and leakage of chemicals in the campus.

10 ENVIRONMENTAL AUDIT -QUESTIONNAIRES

The areas of eco/environmental/green auditing to be followed/practiced by participating institutions:

- I. Waste Minimization and Recycling
- II. Greening
- III. Energy Conservation
- IV. Water Conservation
- V. Clean Air
- VI. Animal Welfare
- VII. Environmental Legislative
- VIII. General Practices

Does any Environmental Audit conducted earlier?

Yes, this is the third time a systematic way of monitoring their environmental eminence initiative taken by Jaypee university of Information Technology for environment protection.

What is the total permanent population of the Institute?

Particulars	Total
Students	2200
Teachers	97
Non-Teaching Staff	356
Sub Total	3662
Approximate Number of Visitors (Per day)	50

Where is the campus located?

Jaypee university of Information technology is located in Waknagat, P.O. Waknaghat, The Kandaghat, Distt. Solan-173234 (H.P), India

Which of the following are available in your institute?

1 Garden area	Available
2 Playground	Available
3 Kitchen	Available
4 Toilets	Available
5 Garbage Or Waste Store Yard	Available
6 Laboratory	Available
7 Canteen	Available
8 Hostel Facility	Available
9 Guest House	Available

Which of the following are found near your institute?

1 Municipal dump yard	Not in the vicinity of the institute, No No
2 Garbage heap	No Garbage heaps
3 Public convenience	Yes, public convenience is available
4 Sewer line	Installed
5 Stagnant water	No stagnant water
6 Open drainage	Yes, properly maintain and sanitized
7 Industry - (Mention the type)	No
8 Bus / Railway station	Nearby from campus
9 Market / Shopping complex / Public halls	Yes, within 500 mtr.
10 Effluent Treatment Plant	Yes, up gradation is in progress

I – WASTE MINIMIZATION AND RECYCLING

1.	<p>Does your institute generate any waste? If so, what are they?</p>	<p>Yes, Solid waste, Canteen waste, paper, plastic, E-waste etc.</p>		
2.	<p>What is the approximate amount of waste generated per day?</p>	Wet Waste	E-Waste	Dry Waste
		600 kg	10 KG	200 KG
3.	<p>How is the waste generated in the institute managed? By</p> <p>1 Composting 2 Recycling 3 Reusing 4 Others (specify)</p>	<p>Reuse of one side printed Paper for internal communication. Sewage water used for gardening. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste. Horticulture waste is also disposed by Solan Authority.</p>		
4.	<p>Do you use recycled paper in institute?</p>	<p>Yes</p>		
5.	<p>Do you use reused paper in institute?</p>	<p>Yes</p>		
6.	<p>How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.</p>	<p>Done in locality for awareness of resource crunches</p>		
7.	<p>Can you achieve zero garbage in your institute? If yes, how?</p>	<p>Yes, 85% achieved, Possible through waste management plan</p>		

II – GREENING THE CAMPUS

8.	Is there a garden in your institute?	Yes, about Approx. 42% areas are developed as Gardens.	
9.	Do students spend time in the garden?	2-4 Hours during winters	
10.	Total number of Plants in Campus	Plant type	Approx. number
		Trees	3700
		Ornamental	2000
11.	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Ashoka, Ficus Religeosa, Boganvella, Bottle palm, Tunn, Jackfruit and many more as per geographical regime.	
12.	Is the university campus have any Horticulture Department	Yes	
	Number of Staff working in Horticulture Department	17 Gardeners, Engg. Deptt. look water pipe line maintenance and Admin officer looking maintenance.	
13.	Number of Tree Plantation Drives organized by college per annum. (If Any)	Yes, Two Tree Plantation Drives are Organized Annually. 35 trees and 140 shrubs planted in this financial year.	
14.	Number of Trees Planted in Last FY.	20	
	Survival Rate	95%	
15.	Plant Distribution Program for Students and Community	Yes, Saplings are distributed to Students and visitors at various Occasions. Besides this landscape of some area in city are developed by Institute.	
16	Plant Ownership Program	Various trees are planted and owned by faculty, staff, visitors and as well as by the students. The name plates are also displayed near the plants.	

III – ENERGY

17.	List ten ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.	Electricity saving by use of CFL/LED bulbs for illumination, LPG saving by use of Pressure cookers for cooking food. We also use bio gas plant for community gas uses.
18.	Are there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some	Yes, energy saving methods like switching off the electrical gadgets, when not in use. Use of Natural Lights and Natural Ventilation is promoted. Messages are displayed at various locations to make aware the Peoples about Energy Savings. Renewable source of energy through limited solar street lighting installed at Jaypee university of Information Technology.
19.	How many CFL/LED bulbs has your institute Installed?	100 % of Total Conventional bulbs are Replaced by LED Lights.
20.	Are any alternative energy sources employed / installed in your institute? (Photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.	Yes, upgradation work is in progress
21.	Do you run “switch off” drills at institute?	Yes
22.	Are your computers and other equipment’s put On power-saving mode?	Yes, In Practice
23.	Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how Many hours?	Yes, All machinery is working only when required. Computers & Printer are switched on during the usages only.

IV – WATER CONSERVATION

24.	List four uses of water in your institute	<p>Basic use of water in campus:</p> <ol style="list-style-type: none"> 1. Drinking –800 KL/month 2. Gardening – 1000 KL/Month 3. Kitchen and Toilets –700 KL/month 4. Others – 150KL/month
25.	How Does your institute store water? Are there any water saving techniques followed in your institute?	<p>08 Nos of Overhead and Underground Water Tanks installed for storage of water.</p> <p>To avoid overflow of water-controlled valves are provided in water supply system. Close supervision for water supply system.</p>
26.	If there is water wastage, specify why and How can the wastage be prevented / stopped?	<p>There is no water wastage methodology used.</p>
27.	<p>Locate the point of entry of water and point of exit of waste water in your institute.</p> <p>Entry-</p> <p>Exit-</p>	<p>Entry- Water comes from Sarika Nala Water Supply at campus. It is located 11KM away from campus.</p> <p>Exit- From Water Drainage System to Campus STP</p>
28.	Write down four ways that could reduce the amount of water used in your institute	<p>Basic Four ways:</p> <ol style="list-style-type: none"> 1. Dripping of water from taps is closely monitored. 2. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage 3. Water Conservation awareness for new Students 4. Reuse of waste water
29.	Record water use from the institute water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many litres of water have been used.	<p>Water Meters are not available for calculation of usage of total quantity only.</p>
30.	Does your institute harvest rain water?	<p>Yes</p>
31.	Is there any water recycling System.	<p>Upgradation work is in progress</p>

V – CLEAN AIR

32.	Are the Rooms in Campus are Well Ventilated?	Yes				
33.	Window Floor ratio of the Rooms	Very Good				
34.	What is the ownership of the vehicles used by your institute? (Please Tick ✓ only one)		Yes			
			Operator-owned vehicles			
		✓	Institute-owned vehicles			
			A combination of campus-owned and operator-owned vehicles			
35.	Provide details of institute-owned motorised vehicles?	Buses	Cars	Vans	Other	Total
	No. of vehicles	2	4	1	6	13
	No. of Non-Air-conditioned vehicles	2	0	1	5	8
	PUC done	Yes	Yes	Yes	Yes	Yes
36.	Specify the type of fuel used by your institute's vehicles:	Buses	Cars	Vans	Other	
	Diesel	2	3	0	5	
	Petrol	0	1	1	0	
	CNG	0	0	0	0	
	LPG	0	0	0	0	
	Petrol	0	0	0	1	
	Electrical/Battery	0	2	0	0	
37.	Air Quality Monitoring Program (If Any)	Yes, Monitoring is being done by approved Laboratory				
38.	Students suffer from respiratory ailments? (If Any)	There has been no reported case of respiratory ailments due to environment pollution.				
39.	Details of Genset	Silent DG Set installed for backup power				

VI – ANIMAL WELFARE

40	List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.)	Birds and Squirrels are commonly found in campus. A variety of birds species and other flora and fauna are available but these are not harmful to humans so institute doing their bit for its conservation.
41.	How many dogs in your area have undergone Animal Birth Control - Anti Rabies (ABC - AR)?	Not required
42.	Does your institute have a Biodiversity Programme or a KARUNA CLUB?	Not Available

VII – ENVIRONMENTAL LEGISLATIVE COMPLIANCE

43.	Are you aware of any environmental Laws? Pertaining to different aspects of environmental management?	Yes
44.	Does your institute have any rules to protect the environment? List possible rules you could include.	Yes (Plantation, Restrictions of vehicles, garbage disposal, etc.)
45.	Does Environmental Ambient Air Quality Monitoring conducted by the Institute?	No
46.	Does stack monitoring of DG sets conducted by the Institute?	Yes, conducted
47.	Is any warning notice, letter issued by state government bodies?	No
48.	Does any Hazardous waste generated by the Institute? If yes explain its category and disposal method	Yes (Disposal of hazardous waste by dilution method)
49.	Does any Biomedical waste generated by the Institute? If yes explain its category and disposal method	Yes, disposal by an authorized vendor

VIII –GENERAL

50.	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
51.	Does your institute have any rules to protect the environment? List possible rules you could include.	Yes
52.	Does housekeeping schedule on your campus?	Yes, the Swachch Bharat movement. Total 75 person employed for this work.
53.	Are students and faculties aware of environmental cleanliness ways? If Yes Explain	Yes, Periodically pollution reduction, plantation, energy conservation awareness campaigns carried out by the institute
54.	Do Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes
55.	Does Institute participate in National and Local Environmental Protection Movement?	Yes, Swatch Campus Abhiyaan by students at Campus.
56.	Does Institute have any Recognition/certification for the environment's Friendliness?	Yes
57.	Does Institute use renewable energy?	Yes
58.	Does Institution conducts a Green/environmental audit of its campus?	Yes, This is the third environmental audit done by the institution
59.	Has the institution been audited/accredited by any other agency such as NABL, NABET, TQPM, NAAC etc.?	Yes

IX Number of Medicinal Plant

Medicinal Plant JUIT		
Sr No.	Location	No.Of Trees
1	Aleovera	100
2	Rama Tulsi	10
3	Shazam	10
4	Jasmine	100
5	Reelvash	1
6	Bannana	5
7	Black Outra	2
8	Aok	2
9	Pipal	4
10	Meta Neem	10
11	Arjun	15
12	Lahsan-Lata	4
13	Geloia	20
14	Turmeric	50
15	Kapoor	10
16	Chhinaar	3

11 BEST PRACTICES/INITIATIVES FOR ENVIRONMENT

A	Renewable Energy Yes, renewable energy is used by Jaypee university of Information Technology.	Limited street light is installed & Jaypee university of Information Technology and up-gradation work is in progress.
B	Biodiversity Conservation Flora and fauna conservation	It is in the schedule plan of Campus Environment committee
C	Tree Plantation Drives Two Drives Annually, as well as Every Guest, is honored by Tree Plantation at Campus.	Yes
D	Ground Water Recharge 06 units of Rain Water Harvesting System.	Yes
E	Pollution Reduction Personal Vehicles users used the carpool.	Faculty & student used carpool & common bus facility.
F	E-Waste Management	Handover to authorized recycler
G	Solid Waste Management Lifting of garbage from Jaypee university of Information Technology campus on an alternate day for landfill.	Yes
H	Adoption of Village School CSR	Yes
I	Water Conservation	Yes
J	Corporate Resource Center (CRC)	Jaypee university of Information Technology Corporate Resource Center (CRC) is dedicated to nurturing future leaders
K	Mitigation measures for Air pollution at construction stage and operation stage by developing adequate green belt.	Yes
L	Mitigation measures for noise pollution by isolation of noise generation activities	Yes
M	Disaster management plan	Yes
N	Fire protection system	Yes
O	Environment/Green committee	For regulating eco-friendly initiatives at campus premises.

12 RECOMENDATIONS

- Water Meter should be installed/monitored at institute for monitoring of water consumption per capita.
- Environmental Monitoring i.e. (Ambient Air Quality monitoring, Stack Monitoring of DG sets, Water and wastewater monitoring need to be conducted by Himanchal Pradesh State Pollution Control Board, approved laboratory with frequency of six month.
- Environment/Green committee formation for regulating eco-friendly initiatives at campus premises and periphery as already Unnat Bhrat Abhiyan and NCC team exit.

13 CONCLUSION

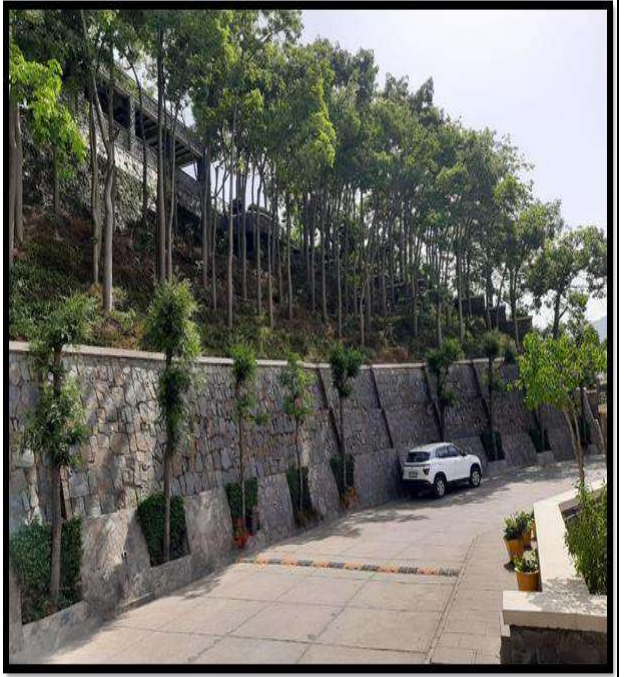
This audit involved extensive consultation with all the campus team, interactions with key personnel on wide range of issues related to Environmental aspects. The Jaypee university of Information Technology has Environmental Committee for sustainable use of resources. The audit has identified several observations for making the campus premise more environmental friendly. The recommendations are also mentioned with observations for college campus team to initiate actions. The audit team opines that the overall site is maintained well from environmental perspective. There is no major observations but few things are important to initiate urgently are water balance cycle and periodic inspection of buildings and initiation of composting at campus.

14 REFERENCE

- The Environment [Protection] Act – 1986 (Amended 1991) & Rules-1986 (Amended2010)
- The Petroleum Act: 1934 – The Petroleum Rules:2002
- The Central Motor Vehicle Act: 1988 (Amended 2011) and The Central Motor Vehicle Rules:1989 (Amended in2005)
- Energy Conservation Act2010.
- The Water [Prevention & Control Of Pollution] Act – 1974 (Amended 1988) & the Water (Prevention & Control of Pollution) Rules –1975
- The Water [Prevention & Control Of Pollution] Cess Act-1977 (Amended 2003) and Rules-1978
- The Air [Prevention & Control Of Pollution] Act – 1981 (Amended 1987) The Air (Prevention & Control of Pollution) Rules –1982
- The Gas Cylinders Rules – 2016 (Replaces the Gas Cylinder Rules –1981
- E-waste management rules2016
- Electrical Act 2003 (Amended 2001) / Rules 1956 (Amended2006)
- The Hazardous Waste (Management and Handling and Trans-boundary Movement) Rules, 2008 (Amended2016)
- The Noise Pollution Regulation & Control rules, 2000 (Amended2010)
- The Batteries (Management and Handling) rules, 2001 (Amended2010)
- Relevant Indian Standard Codepractices

15 CSR Picture of Jaypee University of Information Technology

LANDSCAPING JUIT (TREE PLANTATION)



TREE PLANTATION



ENVIRONMENT PROMOTIONAL (SWATCHTA ABHIYAAN)



MEDICIONAL TREE PLANTATION











16 Awards of Jaypee University of Information Technology

SUSTAINABLE INSTITUTIONS OF INDIA
THE GREEN INSTITUTIONAL RANKINGS 2022

Certificate of Excellence

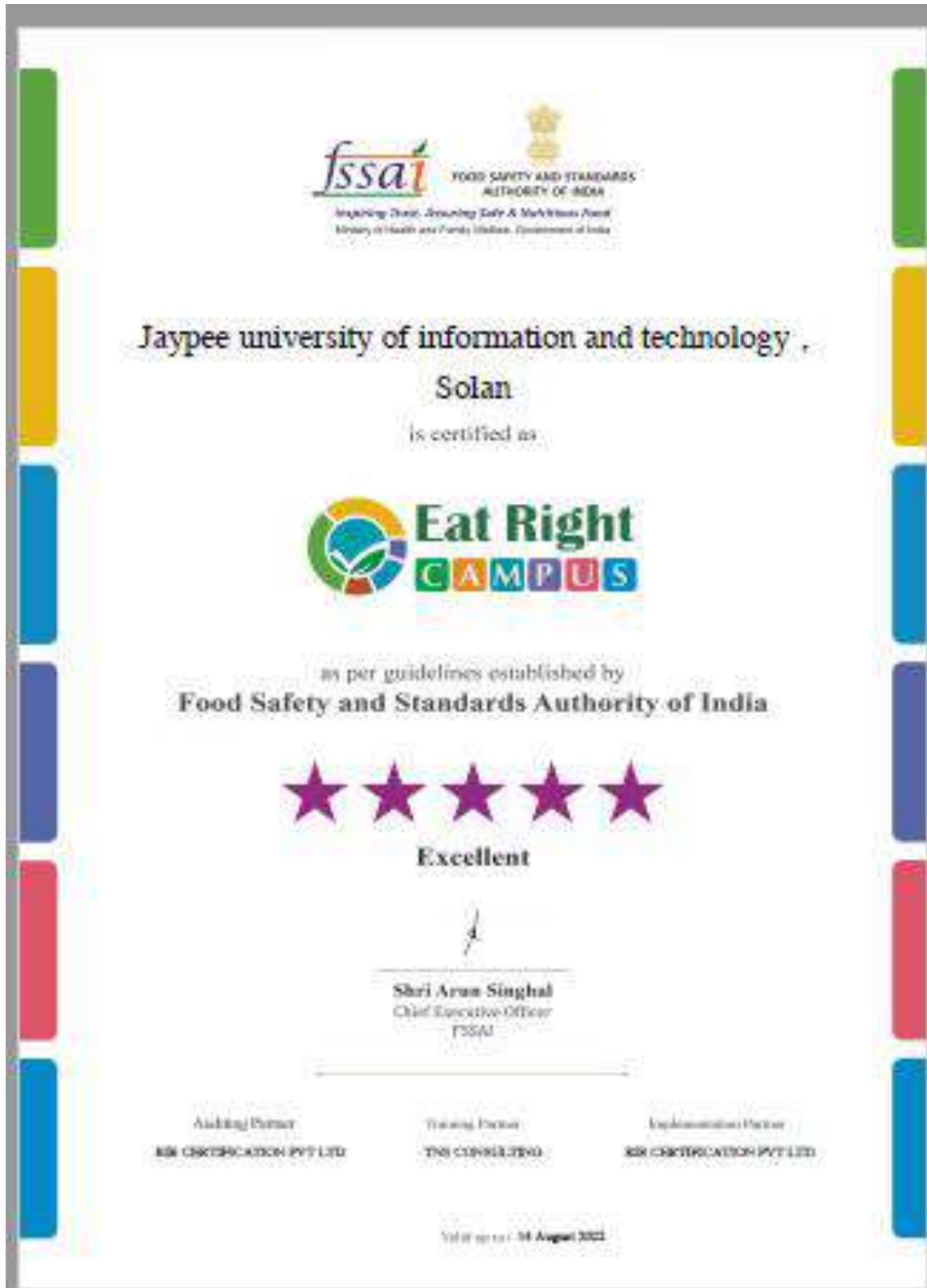
IN PURSUIT OF EXCELLENCE TOWARDS PRACTICING
SUSTAINABLE EDUCATION, THIS CERTIFICATE IS AWARDED TO

**Jaypee University Of Information Technology,
Himachal Pradesh**

and is ranked No. 29 across India
in the Green Institutional Rankings 2022.


R
World Institutional
RANKING 


Executive President





DEPARTMENT OF HEALTH SAFETY AND REGULATIONS
Himachal Pradesh
License
Under
Food Safety and Standards act 2006
(See Regulation 2.1.4(G))



अनुमति संख्या / License Number: 10914011000199

1. अनुमतिधारी के पंजीकृत कार्यालय का नाम और पता /
Name & Registered Office Address of Licensee
JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY
WAKNAGH, P.O. WAKNAGHAT, TEHSIL - KANDAGHAT,
Solon (Himachal Pradesh) - 173215
2. प्राधिकृत कीमती का पता /
Address of Authorized Premises
WAKNAGH, P.O. WAKNAGHAT, TEHSIL - KANDAGHAT,
Solon Town, Solon(Himachal Pradesh) - 173215
3. इकाई का प्रकार / Kind of Business
Cafe/Canteen
4. दूध/ दूध उत्पाद बिना/के बिना स्थान के पते और दूध की क्षमता (एन सी सी) / दूध के साथ दूध चिलिंग सेंटर (सी एन सी) / दूध पैकिंग /
दूध पैकिंग यूनिट का पता / इकाई के अनुमति प्राप्त
For dairy business details of location with address and
capacity of Milk Chilling Centers (MCC)/Bulk Milk
Cooling Centers (BMCC)/Milk Processing Units/Milk
Packaging Unit owned by the holder of licensee/RC
No
5. अनुमति का वर्ग / Category of Licensee
State
6. यह अनुमति राज्य सरकार और मूल अधिनियम, 2006 के अधिनियम की गई और यह अधिनियम के अन्तर्गत के प्रवर्तन के द्वारा
अनुमतिधारी द्वारा प्रस्तुत किया जा रहा है। / This license is granted under and is subject to the provisions of FSS
Act, 2006 all of which must be complied with by the licensee.


 Stamp and Signature of Designated Officer
L.D. THARUR
 Sr. Officer, Food Safety and Control
 Solon, Dist. Solon (H.P.)
 State Licensing Authority under FSSA, 2006

स्थान / Place : Solon
दिनांक / Date : 13/03/2020

अनुमति की नवीनीकरण / Validation And Renewal

License Issue / Renewal Date	Period of validity	License Fee Paid	Items of Food products authorized to Manufacture/ Pack/ Re-label	Installed / Handling Capacity	Signature Of Designated Officer
27/02/2015	26/02/2020	Rs.2000(For Modification)	Please refer to annexure for details.	Please refer to annexure for details.	
27/02/2020	26/02/2025	Rs.11100.00(For Renewal)	Please refer to annexure for details.	Please refer to annexure for details.	

*The Application for renewal of license shall be submitted 30 days prior to the expiry date mentioned above after which Rs. 100 per day will be charged up to the date of expiry.
Disclaimer-This License is only to commence or carry on food businesses and not for any other purpose.

THANKS

