# GREEN MOBILITY INITIATIVES

**Guru Nanak Dev University**
**Amritsar**

राष्ट्रीय मूल्यांकन एवं प्रत्यायन परिषद

विश्वविद्यालय अनुदान आयोग का स्वायत्त संस्थान

**NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL**

*An Autonomous Institution of the University Grants Commission*

# Certificate of Accreditation

The Executive Committee of the
National Assessment and Accreditation Council
on the recommendation of the duly appointed
Peer Team is pleased to declare the
Guru Nanak Dev University
Amritsar, Punjab as
Accredited
with CGPA of 3.51 on four point scale
at A grade
valid up to December 09, 2021

Date : December 10, 2014

Director

EC(SC)/04/RAR/87

Preserve Protect Environment Save

Er. S.K.Goyal
M.E. (Env.), FIE (India)
Sr. Env. Engineer(Retd.)
Punjab Pollution Control Board(PPCB)

EIA Co-ordinator (QCI)
Chartered Engineer,PPCB

# Certificate

Certified that a team of faculty members & students, under the leadership of **Prof. Ashwani Luthra, Director IQAC** of Guru Nanak Dev University, Amritsar has conducted a detailed **Environmental Green Audit of various Green Initiatives taken by the university** covering different aspects such as Green Cover, Green Mobility, Air Quality Monitoring, Water and Wastewater Management, Green Energy Initiatives, Solid Waste Management, Bio-Medical Waste Management, and E-Waste Management, for the preservation and protection of environment in its campus. Data and credentials in the report have been scrutinised and are found **Satisfactory**.

Efforts made by the leadership, faculty and students of the University towards environment and sustainability are commendable and worth appreciating.

**Dated**: NOV.25,2021

**(Er. Samarjit K. Goyal)**
Chartered Engineer
Pb Pollution Control Board

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# CENTRE FOR SCIENCE AND ENVIRONMENT

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LEAVES OF IMPORTANT SURVIVAL TREES IN INDIA — MAHUA, KHEJDI, ALDER, PALMYRA AND OAK

November 29, 2021

The Coordinator
Centre for Sustainable Habitat
Guru Nanak Dev University
Amritsar

**Subject: Certification for different Audits under Green Campus Initiatives**

Dear Sir,

From the past six years, Centre for Science and Environment (CSE) and Guru Nanak Dev University (GNDU) Amritsar have been working together on CSE's Green Campus Initiative and audit programme. Under this engagement, CSE has supervised multiple environmental audits and trained the faculty, staff and students at GNDU as well as other universities and colleges across India. The results and outcomes of this engagement have been published by CSE in multiple reports such as 'A Green Campus Compendium: Incubation, Experimentation and Demonstration of a Green Future' and 'Green Campus Movement'. Appreciation letters have also been shared at the various stages of this programme. CSE appreciates that the faculty at GNDU has prepared the following audit reports:

1. Green Cover of GNDU
2. Green Mobility Initiatives
3. Air Quality Monitoring
4. Liquid Waste Management
5. Green Energy Initiatives
6. Solid Waste Management
7. Bio-Medical Waste Management
8. E-Waste Management

CSE commends GNDU's efforts towards realising Sustainable Development Goals and extends its full support and expertise in its future endeavours.

Yours' cordially,

Rajneesh Sareen

Rajneesh Sareen
Programme Director
Sustainable Buildings and Habitat Programme
Centre for Science and Environment

## Preface

Guru Nanak Dev University Campus is the pioneer to introduce green mobility initiatives within its region. Introduction of bicycles and electric buses to facilitate the movement of students, staff and the visitors of the university is a unique effort towards attaining the targets of sustainable development goals. Technically constructed coloured footpaths attract and encourage many of them to walk under lush green tree cover along them. An audit of green mobility has been prepared for Internal Quality Assurance Cell, GNDU jointly by Dr. Ashwani Luthra, (Professor) and Dr. Kiran Sandhu (Associate Professor) of Guru Ramdas School of Planning, GNDU. The report showcases the initiatives of the university with the aim to reduce its contribution towards carbon footprints.

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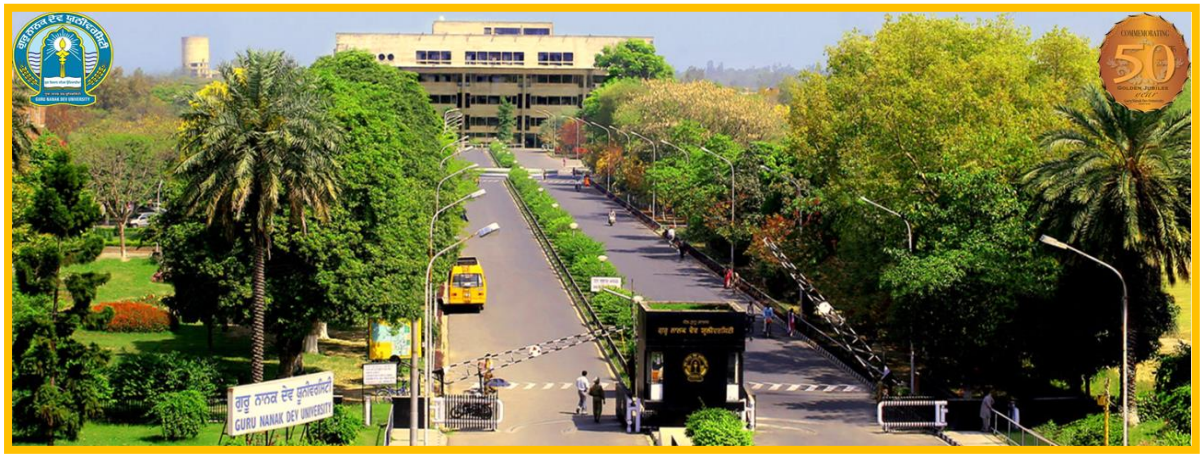
# GURU NANAK DEV UNIVERSITY




With the glorious history of past fifty years, Guru Nanak Dev University was established at Amritsar on November 24, 1969 to mark the Birth Quincentenary of Sri Guru Nanak Dev Ji, the apostle of universal brotherhood, truthfulness, non-violence, compassion, tolerance, harmony, humanity, strict observance of moral & ethical values in daily life, who is also revered as the founder of Sikhism. It won't be an exaggeration to state that His teachings and preaching & His own personal life are perfect examples to be emulated by the entire mankind even after about four and half a centuries and will remain so eternally. Ever since its foundation the endeavour of the university has always been to meet the objectives enshrined in the Guru Nanak Dev University Act 1969, which emphasized that the new University would make provision for imparting education and promoting research in the humanities, learned professions, sciences, especially of applied nature and technology. Studies and research on the life and teachings of Guru Nanak, in addition to working towards the promotion of Punjabi language and spreading education among educationally backward classes and communities are the other commitments. In consonance with these expectations, the university in its eventful history of 50 years has taken long strides in spreading the message of Guru Nanak Dev ji and promoting education in such fields as Science, Arts, Management, Information Technology, Industrial Technology, Environment, Planning and Architecture. To fulfil its commitment, the tuition fee charged from the students of the departments of Guru Nanak Studies and the School of Punjabi Studies has been waived. The UGC conferred this University with status of "University with Potential for Excellence" in 2012. The National Assessment and Accreditation Council (NAAC), Bangalore in November 2014 reaccredited the university in 3rd cycle with CGPA of 3.51 out of 4 point scale at "A++" grade, the highest in the region.

Guru Nanak Dev University is a high performing state public university as it has improved its ranking from 80 in 2017 to 51 in 2020 among all Central, Public and Private Universities in the country (NIRF, MHRD, GoI). It is reckoned among top 9% universities of the world and top 10 state public universities of India by Centre for World University Ranking (CWUR), a leading international agency engaged in grading the top ranking universities world-wide since 2012. QS I-GAUGE Rating System has rated the university in the Diamond Category in the field of 'research, faculty quality and infrastructure' by the. It was also shortlisted for the University of the Year Award in the 16th FICCI Higher Education Summit 2021 organized by FICCI jointly with the Ministry of Education and Ministry of Commerce & Industry, Government of India. High quality research has improved the H-index of the university from 64 to 119 with top 10 percent highly cited papers in Scopus. The university is placed among the top 4 Institutions in Punjab and 10 Institutions in North India by Nature Index,

The University today boasts of 43 teaching departments at the Campus and 149 affiliated colleges, 16 Constituent & University Colleges and 53 Associate Institutes, many of which are located in the rural areas. The university has always strived hard to make the benefits of higher education accessible to the rural masses. More than twenty thousand students, an overwhelming majority of them being women,

are enrolled in various Departments at University Campus and Constituent Colleges. On-line admission, on-line counselling, on-line re-evaluation, introduction of Credit Based Continuous Evaluation Grading System etc. are a few hallmarks of the university. All the results have been computerized and OMR (Optical Magnetic Recognition) system is being used to bring in more efficiency and transparency. This is the first University in the region to have computerized its examination and registration system. The students now have an all-time access to their results through SMS service. It acts as a model higher education institution for digital initiatives like e-office management system, digital library, Wi-Fi enabled campus, high speed online teaching modules, and smart classrooms to name a few.

Academically also, the university has carved a niche for itself in the field of Higher Education in the country. Our University is recognized as one of the leading institutions in North India in the domain of Science and Technology. Many coveted projects from the apex bodies like the DST, CSIR, BARC and other organizations worth crores of rupees have been awarded to our faculty members. One of the four Nodal Calibration Centres established by Bhabha Atomic Research Centre is set up at our campus. The Centre of Emerging Life Sciences equipped with the state-of-the-art scientific instruments worth crores of rupees, well-maintained Botanical Garden, Department of Sports Medicine & Physiotherapy are a few of the jewels in the crown of the university. To more strengthen the university infrastructure and to prepare students for employments, computer lab with the help of TCS is also established. Further, the UGC has granted the University the Centre with Potential for Excellence in Life Sciences and Centre for Advanced Study in Chemistry.

In the field of culture and sports also, the achievements of the university are noteworthy. The university has been national Champion for 10 times & the winner of the North-Zone-Inter-Varsity Cultural Championship for 13 times. The winning of the coveted Maulana Abul Kalam Azad Trophy, the highest sports award for a university in the country, for a record number of 23 times, speaks volumes about its supremacy in the field of sports. An Astro Turf for hockey, a swimming pool of international standards, a velodrome, a Gymnasium hall, shooting range & many other state-of-the art sports facilities are the prized possessions of the university. The Lifelong Learning Department of the university is successfully catering to the female folk of the region to make them self-dependent by offering various skill development programmes. The Track record of employment of our students by big business Houses and Multi-National Companies has been very satisfactory. Our students of engineering, management and commerce field are employed by companies in India and abroad. They are all contributing to the creditworthiness of the University by their hard work and diligence. In the last year alone, almost all our engineering and management students were recruited by various companies through campus placements. It goes without saying that all these achievements would not have been achieved, but for the heart and soul put in by the students, faculty members, and administration of the university. Undoubtedly, the university remains committed to achieve the lofty goals, for which it was founded after the name of Sri Guru Nanak Dev Ji.

The university is known for its GREEN CAMPUS initiatives in the field of energy, water, solid waste management, micro mobility and health and hygiene. Some of the key initiatives of the university are energy efficient buildings, rooftop solar energy plant, solar water heaters, censor based urinals, toilets and wash basins, maintenance of lawns as water recharge systems, rooftop rainwater harvesting, on campus sewerage water treatment plant, organic waste management through bio-gas plant and vermi-compositing, natural processing to convert agro-waste into compost, involvement in recycling and reuse of paper, plastic, mettle and other waste, efficient medical waste management, regular thickening of tree cover by planning tree each year, making the campus car free, facilitating the students, staff and the visitors by free of charge e-vehicle facility for micro mobility within the campus, developing lush green covered footpaths, regular sweeping of the roads and buildings at least twice a day and regular disinfectant spray to help the university bag the second cleanest State University in India awarded by the Ministry of Human Resource Development, Government of India under Swachh Campus Ranking for the last two years continuously.

## 1. THE CONTEXT

The University has about 500 employees and 9000 students with mobility needs of arriving to the University from outside the campus as well as reaching their respective departmental buildings and being able to visit other places in the campus as required. Prior to implementation of the green mobility campus, the ever increasing number of motor vehicles and two vehicles in the University was posing a grave problem of vehicular noise, air pollution and increasing concretization of spaces for parking. Examining the problems arising from plying of motorized vehicles on campus, the leadership in consultation with an expert group prepared a blueprint for introducing a paradigm shift towards green mobility in the next few years time. Accordingly a number of path breaking initiatives were launched that have been instrumental in reducing vehicular influx on campus and creating mobility sans all its damaging impacts. Truly the campus has emerged as a model of green mobility that can be replicated in other institutions across the country.

## 2. OBJECTIVES OF THE PRACTICE

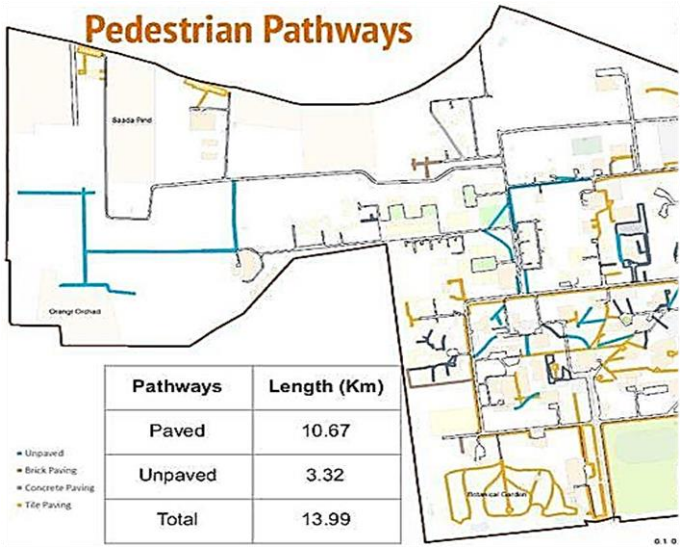
The principle objective of pursuing green mobility in the campus is to reduce the harmful vehicular emissions and thereby the carbon footprint of the University in keeping with the principles of sustainable transport where pedestrianization, cycling and other ecological modes get priority over motorized transport. By doing so the University endeavours to demonstrate that green mobility is realistic, attainable and can deliver significant short and long terms gains in reducing pollution, enhancing health of residents, reducing fuel consumption, reducing heat island effects and influence micro-climate without compromising on mobility requirements of the campus residents and visitors.

## 3. THE PRACTICE

*'Sustainability is no longer about doing less harm. It is about doing more good.'* In tune with this maxim, the University has implemented the following practices to achieve its objective of *high mobility and accessibility through green transport interventions.* As such the following green transport interventions have been adopted in the University.

### 3.1. Construction of Walkways and Pedestrian Precincts

In the last five years, prioritising and promoting pedestrian behaviours in the campus, the University has created a network of 14 kms of footpaths and walkways throughout the campus. Besides the footpaths that form a part of the road right of way, direct route walkways are strategically constructed to encourage pedestrian mobility over vehicular use. The University hostels and residential pathways are constructed of dull red and yellow textured concrete tiles that meet aesthetic aspirations, are visually attractive and walkable besides meeting the standards of pavement design in terms of widths and pedestrian flows. Resultantly pedestrian movement has increased substantially with students, staff members and even visitors resorting to walk and experience the pleasant serene environs rather than using motorized vehicles. A mix of evergreen and deciduous trees planted strategically along the walkways ensure




| Pathways | Length (Km) |
|---|---|
| Paved | 10.67 |
| Unpaved | 3.32 |
| Total | 13.99 |

shade during intense summer and are therefore usable round the year. Also support infrastructure like benches have been placed along walkways and footpaths as rest spaces which encourages pedestrian mobility.

### 3.2. Construction of Peripheral Parking Lots

The university was experiencing influx of two-wheelers and cars in large volumes on its campus. Its parking lots used to be full and the vehicles could be seen parked along its roads. Movement of these vehicles within the campus was contributing to high amount of carbon footprints. Evidently, it asked for green mobility initiatives to be taken by the university to model it as a green campus.

Thus, it was decided to make the campus vehicle free. However, after looking into different aspects, it was decided that the cars of the students and the visitors will be parked in two mega parking lots constructed adjoining the front and back gates of the University. This has led to

creation of parking and vehicle free administrative and academic zones and also reduced the carbon footprints significantly through reduced presence of high volumes of vehicles and on all its roads. These two parking lots of the size 1.77 and 3.06 acres, have a combined capacity of 762 four wheelers and 557 two wheelers. Students, visitors and employees park their vehicles in these parking lots and walk to the departments through connected walkways. Restricting the vehicles on the University gate has ensured minimal noise and air pollution and a negligible vehicular movement on the inner roads of the University.



Boom barriers are installed at the entry gate of the university to direct the cars and two-wneelers of the students and the visitors into the parking lots. Also, many other such barriers are installed at strategic location within the university to enhance the safety and security of the campus is endured by checking the entry of the outside vehicles.

### 3.3. Introduction of E-Rickshaw and Cycle Mobility

In 2018, the University introduced the *Cycle on Rent* concept by inking a pact with the Hexi Cycle Mobility Company. With this, the University earned the distinction of becoming the first University Campus in India to launch an *avant-garde* initiative of this nature. Three hundred Hexi Smart Bicycles were distributed at all strategic locations in a special cycle parking space with the provision of using the same for a nominal rent facilitated through a special app using a mobile number. The initiative became immensely popular amongst the students and staff. However, the Covid-19 lockdown that led to closure of the University for more than a year dealt a severe blow to the initiative. However, with the resumption of offline education mode and normalization of university activities, the University is in talks with the UK based organisation *Cities forum* for reintroduction of such an initiative.

### 3.4. Introduction of E-Carts

Eight eco-friendly electric carts have been introduced to meet the micro mobility requirements within the campus. Each bus is powered by a bank of 12, 6V batteries (72 V system). The fourteen-seater buses transport 112 passengers at a point of time and the bus stops and charging stations have been purposefully located. These carts operate at schooled timings on specific routes to serve the students and the visitors to the university free of cost. By the implementation of this system noiseless, zero carbon emission mobility has become a reality. The mode is turning out to be very popular amongst the students and staff alike.

### 3.5. University Buses for Mobility Facilitation


In addition to the above initiatives, the University has since long been running its fleet of four buses to bring down dependency of the University staff and students on personal modes and promote use of mass transport as the buses for home to work trips between different locations in the city and the campus. These buses transport the staff and the students of the university three times a day on work days. About 150 university passengers travel by these buses daily.

## 4. EVIDENCE OF SUCCESS

The University has become one of the first in the country to take such radical decisions for reducing carbon emissions through the implementation of green mobility initiatives.

### 4.1. Environmental Sustainability

Drastic reduction of vehicular traffic within the University is a direct result of this initiative as more and more resident population has shifted to pedestrian, cycling and e-bus modes. Favourable infrastructure and awareness campaigns have led to change of user behaviours in favour of non motorised and eco friendly transport. The University roads remain clean, dustless, noiseless and odourless because of less plying of vehicles post introduction of green mobility measures.

### 4.2. Social Sustainability

The initiative has helped promote a sense of pride, belonging and identity to the campus population who have embraced the initiatives in a big way thus supporting the University Authorities through their enthusiasm and support. Also the initiatives have generated employment for eight people as e-bus drivers as also paved way for more employment opportunities to arise in near future with its expansion and the reintroduction of Hexi like organised bicycling facilities.

### 4.3. Economic Sustainability

Drop in fuel consumption of personal vehicles through pedestrian/cycling endeavours and the e-buses is a prime benefit underpinning economic sustainability of the initiative. For instant, in case of the e-buses, **e**stimated energy consumption per year for charging 8 e-buses, for average 4 hours per day for 180 days comes out to be 2x4x8x180 = 11,520 kWh. Though one may argue that the use of e-buses may lead to electricity load for charging the batteries but the fact remains that this energy consumption is easily offset by the saving in diesel cost.

## 5. PROBLEMS ENCOUNTERED AND RESOURCES REQUIRED

In such like decisions it may be mentioned that transitions are not easy and it takes a lot of time and effort to construct infrastructures and implement such measures. The University also faced some roadblocks at an initial stage wherein the local city students were resisting the application of personal vehicle mobility and parking restrictions. However with competent intervention of the University Authorities, the students were convinced of its benefits and briefed of their and the University's collective responsibility to reduce the carbon footprint. The second challenge came with the country going into an indefinite lockdown which had a detrimental impact on the Hexi cycle operations in the campus to the extent that the company had to withdraw operations in the absence of student strength. However, with the campus resuming normal operations and returning to full student strength, negotiations are on with Cities Forum, UK and it is expected that the cycling initiatives shall restart soon.

**Prepared by**
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