Panjab University
Chandigarh

Criterion IV: Infrastructure and Learning Resources

CRITERION IV: INFRASTRUCTURE AND LEARNING RESOURCES

4.1   Physical Facilities

4.1.1   How does the university plan and ensure adequate availability of physical infrastructure and ensure its optimal utilization?

Our forefathers visualized self-sustaining campus in Sector-14 by ensuring well integrated infrastructure in the form of adequate availability of Academic buildings, A.C. Joshi Library, Hostels for boys and girls, Student canteens, Sector-14 market for day-to-day needs etc. Since then many new buildings in Sector-25 have come up including – UIET, UIAMS, Dr Harbans Singh Judge Institute of Dental Sciences and Hospital, foreign students hostel (near completion) and two more hostels one each for boys and girls. Most recently Shooting range and Indoor swimming pool of Olympic size are also coming up in Sector-14 campus.

Adequate physical infrastructure is available in all the departments and is improved year by year with financial assistance from UGC (plan grants, non-SAP and SAP), ICAR, DST-FIST, Ministry of Environment, DBT etc. The Physical Infrastructure of the University was improved with the financial support through UGC-XII Plan Grant.

Vice-Chancellor and various authorities of University visualize the future requirements of infrastructure for student-support, teaching-learning, research and administrative processes in new technology driven arena and hence this vision enables the University to plan for the new physical infrastructure.

The existence of full-fledged centralized library with e-resources, University Auditorium for academic and cultural activities, Guest Houses, provision and maintenance of water supply and Electricity, Campus Wide Network with wired & Wi-Fi in all teaching departments and hostels, Internet browsing and computing facility, Class rooms with ICT facilities, use of ICT in administrative offices, Botanical Garden, standard sports fields and gymnasium complex with indoor sports facility, Daycare center, and Healthcare center are examples of visionary leadership.

The adequacy of physical infrastructure in the courses especially in new emerging areas of engineering, computer sciences, management and economics enhances teaching, learning, and research by allowing faculty, students, and staff to have participatory access to physical, information and technological resources on the campus and in the community, region, nation, and world.

Available infrastructure is optimally utilized by sharing of the physical infrastructure among the Departments and by putting in place appropriate administrative controls. Faculty members and students of other institutions are also allowed to refer books and journals in the library and other infrastructure.

4.1.2 **Does the university have a policy for the creation and enhancement of infrastructure in order to promote a good teaching-learning environment? If yes, mention a few recent initiatives.**

Yes, the University creates and enhances its infrastructure on a regular basis year-by-year in order to meet the changing needs of the academic environment as well as to promote a good teaching-learning environment. A few recent initiatives in this direction are mentioned below:

- Implementation of Integrated University Management Information System (http://campus.pu.ac.in) to facilitate transparent and efficient functioning both academic and administrative tasks.
- Separate comfortable work space for the faculty, non-teaching staff, departmental library, seminar hall, and state-of-the-art laboratories in each Department.
- All academic areas, hostels, guest houses, student centre etc are Wi-Fi enabled in Sector-14 campus, whereas wi-fi facility in Sector-25 South campus is in progress and will be operational very soon.
- In some of the buildings, Classrooms equipped with internet connectivity, audio-visual facilities and air-conditioned environment.
- Access to e-resources in the Central Library through INFLIBNET to both faculty and students in addition to its regular print holdings.
- Department libraries are improved with good collection of books, back volumes and national and international journals, internet facility and subscription to electronic databases
- Provision of video-conferencing, smart classrooms, various research CDs and DVDs for the Teachers and the Students to meet their needs of research oriented programs.
- A large number of faculty members have individual laptops and desktops with necessary software for teaching and research and are always connected to the outside world through Campus Wide Network and Powerful Internet bandwidth.

4.1.3 **How does the university create a conducive physical ambience for the faculty in terms of adequate research laboratories, computing facilities and allied services?**

- As mentioned earlier the University provides all the required facilities in terms of research laboratories, computing facilities etc. The Computer Centre provides access to Licensed Software and Open source software through its Servers for computing purposes directly on their desktops.
- Facilities such as scanner, printer, and Xerox machines are provided in each department.
- For computations, Internet access is provided to the faculty.
- To keep the ambiance conducive for work and to maintain good work culture access to consumables, support services (electricity, water etc.) is provided uninterrupted. The round-the-clock security services (installation CCTV cameras at vulnerable locations) and onsite maintenance staff ensures a comfortable and secure working environment.

4.1.4 Has the university provided all departments with facilities like office room, common room and separate rest rooms for women students and staff?

Yes, the University is gender sensitive. All the departments have individual office room, common room and separate rest rooms for women students and staff across the offices of all the teaching departments

4.1.5 How does the university ensure that the infrastructure facilities are disabled-friendly?

The university ensures that the infrastructure facilities are disabled-friendly through:
- Provision of Ramps with Standard Slopes to approach Plinth Level/First Level of all Academic & Public Buildings.
- Availability of ramp facility in Girl's Hostel, Student's Centre, Administrative office, USOL and Dr Harbans Singh Judge Institute of Dental Sciences. Also ramp facility at the entrance of each academic building is also provided.
- Availability of lifts in Central Library, Administrative office, USOL, Dr Harbans Singh Judge Institute of Dental Sciences & Hospital and Hostels having four floors.
- Availability of security staff in each building to help the disabled persons.
- The Visually challenged students are provided with scribes and separate examination room to write their examinations.
- Provision has been made for installation of elevators in all buildings currently under construction besides the buildings recently completed.
- All new buildings /upcoming buildings/provided/planned with Toilets for special persons as per Standard design.

4.1.6 How does the university cater to the requirements of residential students? Give details of

- Capacity of the hostels and occupancy: (to be given separately for men and women)
- Recreational facilities in hostel/s like gymnasium, yoga centre, etc.
- Broadband connectivity / Wi-Fi facility in hostels.

A hostel is a home away from home. Aware of the special needs and requirements of students, who come from far-flung places to this center of learning, the Panjab University tries to provide them a safe, secure and affordable accommodation.

There are eighteen Residence Halls (17 for students and one for working women) on the campus, 8 for boys, 9 for girls and 1 for working women. These Halls, which accommodate about 6770 students (approximately 3200 boys, 3500 girls & 70 Working Women), are named after eminent men and women, historical personalities and personages: Bebe Nankee, Mehr Chand Mahajan, G. C. Chatterji, Shanti Swaroop Bhatnagar, Vallabh Bhai Patel, Lala Lajpat Rai, Justice Teja Singh Samundari, Vivekananda Hall, Mata Gujri, Laxmi Bai, Sarojini Naidu, Kasturba Gandhi and Savitri Bai Phule, which played an important role in shaping the destiny of world and left footprints on the sands of time.

The University Hostels take pains to give its students a neat and clean environment and a comfortable place to live in. There are Wardens and attendants on duty round the clock. Each hostel has a dining hall and canteen, several desert and water coolers, a visitors' lounge, and invariably an outdoor court for badminton, volleyball etc. A cricket kit is also made available in each hostel. The mess provides a balanced diet at reasonable rates. The Common Room is fairly well equipped with current magazines and newspapers. There is provision for indoor games, LCD TV and music system. More recently 24 hours internet connectivity through Wi-Fi has been provided in each hostel. In case of emergencies, doctors, medical facilities, and transportation are also provided.

Architecturally, the hostels are aesthetically laid out with plenty of open space and a lot of greenery. The rooms are comfortable, fitted with fan, lights and hard furniture. Each wing of the hostel has several verandahs and balconies.

Comforts are important but they are not enough. Man is a social animal and needs to interact with others. The resident students are encouraged to participate in cultural and social activities. Colorful evenings of song and dance are not unusual on the campus. Talent shows, dramatics and literary events are organized from time to time. The inmates of a hostel are encouraged to live in harmony, like one big family, lending each other a helping hand whenever, mutually cooperating to make hostel life a rich and fruitful experience.

There is no doubt that during these formative years in the hostel, life-long bonds are created and friendships cemented. This is a time, which will stand out in the

memory as a golden period. University experience is an important milestone in an individual's life, the stepping-stone to an adult life of responsibility and care. The hostels of Panjab University try to provide an ideal atmosphere for healthy, all round development of personality and a launching pad for glorious career ahead. The security is ensured for the students round the clock.

Capacity of the hostels and occupancy:

# of Hostels	Capacity	Occupancy
8 for Boys	3200 (400 in each)	3200
9 for Girls	3500 (390 in each)	3500
1 for Working Women	70	70

Recreational facilities in hostel/s like gymnasium, yoga centre, etc.

The Common Rooms are fairly well equipped with current magazines and newspapers. There is provision for indoor games, LCD TV and music system.

The resident students are encouraged to participate in cultural and social activities. Colorful evenings of song and dance are not unusual on the campus. Talent shows, dramatics and literary events are organized from time to time to promote community living among the students.

Broadband connectivity / Wi-Fi facility in hostels

24 hours internet connectivity through Wi-Fi has been provided in each hostel.

4.1.7 Does the university offer medical facilities for its students and teaching and non-teaching staff living on campus?

Bhai Ghanaiya Ji Institute Of Health at Panjab University offers medical facilities for its students and teaching/non-teaching staff living inside as well as outside the campus. The health centre is serving the strong community of about 40,000(forty thousand) consisting of students, teachers & non- teaching employees (both serving and retired) along with their dependents and all the daily wagers, mess-workers and on contract employees, all university delegates, guests, visiting dignitaries etc. The number of patients visiting Health Centre is about 300 to 350 per day on an average. The details of health centre are place at Annexure 'A' which will be shown to the NAAC Team on their visit.

4.1.8 What special facilities are available on campus to promote students' interest in sports and cultural events/activities?

Facilities for Sports Activities

The following facilities are available on the campus to promote students' interest in sports activities:

1. **Budget**

   There is a provision of two budget heads, one budget head of Panjab University Sports Committee and other of Amalgamated Fund. These budgets are used to meet the expenses of various sports activities such as Special Incentives for the outstanding Sports persons, Purchase of Sports equipment and Uniforms, Repair, Renovation & Restoration of Sports grounds/Halls etc.

2. **Playing Facilities**

Sr	Name	Sr	Name
1	One Multipurpose Gymnasium Hall (Air Conditioned)	12	One Netball Ground
2	400 Mtr. Grassy Athletic track (8 Lanes)	13	One Korfball Ground
3	Two Basketball cemented courts of International standard (with flood lights)	14	Two synthetic Lawn Tennis courts
4	Four Volleyball Courts	15	Eight Grassy Lawn Tennis courts
5	One Hockey Ground	16	One Cinder Lawn Tennis court
6	Two Football Grounds	17	Swimming Pool- One
7	Two Handball Courts	18	10 Mt. Shooting Range (Centrally AC)
8	Two Kho-Kho Courts	19	All Weather Swimming Pool (under construction)
9	Two Kabaddi Courts	20	Hockey Astroturf (under construction)
10	Three Softball Grounds	21	Cricket Stadium (under construction)
11	Two Cricket Grounds	22	Two Sports Hostels (One for boys and One Girls)

3. **Awards/Scholarships/Stipends**
   - ✓ Cash awards are given to outstanding sports persons at National as well as International levels. Information about Cash Awards to be given to University Players is given at Q-2.1.5.
   - ✓ Special Incentives for the outstanding Sports persons such as
     - i. free education (exemption from tuition fee + other fee except exam fee)
     - ii. Free hostel accommodation except mess and canteen charges

iii. Free Swimming Pool and Gym facility

4. **Advanced and Technical Coaching camps**
   The advanced and technical camps are organized in all almost all indoor and outdoor games for both men and women.

5. **Special Policy for Fee Exemption**
   The special policy for fee exemption is available to PU students for different levels of achievement in sports for the categories of Championships/Tournaments:

   Category-A1: Performance in Olympic, World Championships, World Cups, World University Games, Asian Games, Commonwealth Games, World University Championship

   Category-A2: Performance in Champions Trophy, Commonwealth Championships, Davis cups, Wimbledon, US, French & Australia Open Tennis Championships, Uber Cup, All England badminton Tournament, World University Championship, Cricket Test matches including one day match, International Athletic Meet, SAF Games

   Category-B: Performance in National Games, National Championships, National Sports Festival for Women by National Sports federation

6. **Admission in a Teaching Department on the basis of Sports Achievement**
   The University has created additional seats (5%) for extraordinary sports persons in a teaching department as well as hostel. For this, the University has a well defined procedure to grade the game performance of students for admission purposes.

7. **Diet Money to Campus Players during matches and coaching camps**
   - ✓ Refreshment @ Rs 50/- per student per match/event
   - ✓ Refreshment @ Rs 25/- per head per session during caching camp for Inter-College tournaments
   - ✓ Refreshment @ Rs 25/- per student per match/event during Inter-Hostel, Inter Department Open and friendly matches
   - ✓ DA @ Rs 100/- per students per day (fixed) during Inter-College tournaments outside Chandigarh

8. **Refreshment & TA/DA to Inter-University Players**
   - ✓ Rs 50/- per head per match/event/bout to players during Inter-University Tournaments

- ✓ Local conveyance and bedding allowances as per actual expenses
- ✓ DA to Players leaving Chandigarh for Tournaments

9. **Sports Kit/ Uniform & equipment**
   - ✓ Two sets of Sports Kit
   - ✓ One Tracksuit and One pair of shoe
   - ✓ Sports equipment related to the game
10. **Conduct of Tournaments**
    - ✓ Inter-Hostel
    - ✓ Inter-Department
    - ✓ Inter-College Tournaments
    - ✓ Inter-University Tournaments
    - ✓ Open Champioships

Facilities for Cultural Events/Activities

The university has a Law Auditorium with a seating capacity for 900 spectators and two other large Multi-purpose Halls (English Auditorium --240 capacity, Evening Auditorium--240 capacity) specially designed for organizing cultural activities with all-important amenities.

Cultural activities and youth programmes provide opportunities for the expression and development of latent potentialities of the students by encouraging them to find outlets in joyous and constructive ways. The students participate in inter-college and inter-university cultural and literary competitions, zonal youth festivals, hiking and trekking expeditions, rock climbing, mountaineering and youth leadership training camps. These programmes are organized and coordinated by the Cultural Coordinator/Director, Youth Welfare and the Dean Student Welfare.

Panjab University Student Council organizes annual events named "Jankar", "Aggaz" etc. under the guidance of Dean Student Welfare. In these events students show their cultural, intellectual and technical skills.

The annual cultural events organized by PU unfold the hidden talents among the students and inculcates the spirit of competition among them.

The performance of the campus students in various Extra-mural activities like debates, seminars, one-act play etc. is the deciding factor for award of the Extra-mural Activities Scholarship. This scholarship is a fixed amount to be decided by the Vice-Chancellor on the recommendations of the Committee and is paid out of the 'Amalgamated Fund'.

"Cyanide" the annual festival of DCET/UICET, is one of the first student festivals started

in Chandigarh and has a long tradition. The festival is often host to star performers, DJ nights and other events. Goonj is the annual cultural fest and Aavishkar is the tech-fest of UIET. Both the events are marked by a lot of enthusiasm and are also two of the most awaited events in India, especially for undergraduate students of engineering and technology.

4.2   Library as a Learning Resource

4.2.1   Does the library have an Advisory Committee? Specify the composition of the committee. What significant initiatives have been taken by the committee to render the library student/user friendly?

Yes, the University has a Library Committee. Library Committee has 11 members consisting of Dean University Instruction - Chairperson, University Librarian - Member Secretary and Nine Faculty Members. The following significant initiatives have been taken by the committee to render the library services student / user friendly:

- Installation and implementation of Fully Automated Library System using SLIM 21 Software [Webopac, Self Check-in, Self Check-out, Security Gates (through RFID implementation)]
- The Committee is always working on issues related to user needs and recently, the committee has recommended an expansion plan for library in which the Project of Renovation of Outer Reading Hall is taken up.

4.2.2   Provide details of the following:
- Total area of the library (in Sq. Mts.): 12094 sq.mts.
- Total seating capacity: 1000 approximately
- Working hours (on working days, on holidays, before examination, during examination, during vacation)
  - On Working Days, on Holidays, During Vacation -
    - Reading Halls: 9.00am – 9.00 pm.
    - Text Book Section: 8.00am – 10.00 pm.
    - Outer Reading Hall: 24 hrs.
  - During Examination: 8.00 am – 12.00 am (Text Book Section)

- Layout of the library (individual reading carrels, lounge area for browsing and relaxed reading, IT zone for accessing e-resources)
  - ✓ Reading Carrels – For Faculty
  - ✓ Locker Facility – For Research Scholars
  - ✓ Digital Library – For accessing e- resources
  - ✓ Laptop Usage Unit

- ✓ Newspaper Area
- ✓ Separate space on all floors of the library for relax reading
- ✓ Clear and prominent display of floor plan; adequate sign boards; fire alarm; access to differently-abled users and mode of access to collection
- ✓
    - ▪ Digital Signage System on all Floors of the Library displaying the Floor Plan and Stack Area layout, important Notifications
    - ▪ Sign Boards for Stack Area displayed at the entrance of Reading Halls
    - ▪ Full Fledged Fire Safety Equipment Installed
    - ▪ Lift Facility for differently-abled users

4.2.3 Give details of the library holdings::

a) Print (books, back volumes and theses): 7, 38,790
b) Average number of books added during the last three years: 35,000 approximately
c) Non Print (Microfiche, AV): Not applicable
d) Electronic (e-books, e-journals)
  - ✓ E-books - World eBook Library (2,000,000 downloadable books, 23,000 audio books)
  - ✓ Lecture Notes in Mathematics (28 Vols.)
  - ✓ EBSCO Engineering Books – 87
  - ✓ Wiley Chemistry Books - 32
  - ✓ E-journals and Databases – 188 + 15 (Subscribed) & 5000+ (Through Consortia)
e) Special collections (e.g. text books, reference books, standards, patents): Already included in a) above
f) Book Banks: Not applicable
g) Question Banks: Not applicable

4.2.4 What tools does the library deploy to provide access to the collection?

- ▪ OPAC: Webopac [www.library.puchd.ac.in]
- ▪ Electronic Resource Management package for e-journals: NA
- ▪ Federated searching tools to search articles in multiple databases: Summon Discovery tool (Single search box for all the library content) (Under Process)
- ▪ Library Website: www.library.puchd.ac.in
- ▪ In-house/remote access to e-publications
    - ✓ In-house Access – Without Password
    - ✓ Remote Access (Science Direct and Scopus) – With Password

4.2.5 **To what extent is ICT deployed in the library? Give details with regard to**

- Library automation
  Library is fully Automated and uses SLIM 21 Software [Webopac, Self Check-in, Self Check-out, Security Gates (through RFID implementation)]
- Total number of computers for general access: 45 approximately
- Total numbers of printers for general access: 2
- Internet band width speed: 1 Gbps through Computer Centre
- Institutional Repository: Under Process
- Content management system for e-learning: Not applicable
- Participation in resource sharing networks/consortia (like INFLIBNET): Through INFLIBNET, DELNET

4.2.6 **Provide details (per month) with regard to**

- Average number of walk-ins:
  75,000 approximately per month (During Examination Days)
  60,000 approximately (Other than Examination Days)
- Average number of books issued/returned:
  10,000 approximately per month
- Ratio of library books to students enrolled:
  7, 38,790/13000=57:1 approximately
- Average number of books added during the last four years
  40,000 approximately
- Average number of login to OPAC
  1.5 lakh hits on Webopac Per month
- Average number of login to e-resources:
  All Faculty + Research Scholars
- Average number of e-resources downloaded/printed
  5, 53,967 per annum (For all the Databases)
- Number of IT (Information Technology) literacy trainings organized
  Orientation Programmes and workshops for library use are organized from time to time.

4.2.7 **Give details of specialized services provided by the library with regard to**

- Manuscripts
- Reference
- Reprography/Scanning
- Inter-library Loan Service
- Information Deployment and Notification

- OPACS
- Internet Access
- Downloads
- Printouts
- Reading list/ Bibliography compilation
- In-house/remote access to e-resources
- User Orientation
- Assistance in searching Databases
- INFLIBNET/IUC facilities

All the above mentioned facilities are provided by the Library.

4.2.8 Provide details of the annual library budget and the amount spent for purchasing new books and journals.

Total Library Budget – 7 crores.
Amount spent for purchasing Books & Journals and e-subscription - 2.5 crores.

4.2.9 What initiatives has the university taken to make the library a 'happening place' on campus?

The five-story impressive Library building in red stone and concrete is based on modern principles of architecture. Its modular and functional style fulfills the purpose of a planned Library.

Library has a rich Collection of e-resources being used by the Faculty, Research Scholars and students not only from Panjab University but from other parts of the country as well. Time to time, workshops and Orientation programmes are organized to make the Users aware of these resources.

Library organizes Book Exhibitions and thematic Display of books for the users.

The Library building is centrally air-conditioned, fully Wi-Fi, equipped with computer and communication network and has full power backup (Gen Set). A C Joshi Library is the first one in North India to implement RFID technology to support Self check in (24 x 7) and Check out of books as well as the security aspect.

Digital Signage System has been installed in the Library to make the

Students aware about different aspects of Library, New Arrival of Books, Notifications and Current Affairs etc. Special Shuttle bus service at night for Girls Students during Examination Days is made available. SMS alert service for users of the Library is in place. Face book page has been created to enhance our reach to students. E-mail alerts to teachers are sent time-to-time.

4.2.10 What are the strategies used by the library to collect feedback from its users? How is the feedback analysed and used for the improvement of the library services?

The strategies used by the library:
- ✓ Personal interaction with the users
- ✓ Suggestion Register kept at the entrance of Library and
- ✓ Daily review for up gradation and enhancement of services
- ✓ Ask us column on Webopac and Face book Page.

4.2.11 List the efforts made towards the infrastructural development of the library in the last four years.

- ✓ e-subscription facility
- ✓ New A C Plant installed
- ✓ Proper Fire Safety System installed
- ✓ New Digital Library unit created with more space for users
- ✓ Addition of more PCs
- ✓ Laptop Unit created for users
- ✓ Renovation of Washrooms
- ✓ Floor Scrubbing Machine
- ✓ UPS to support Digital Library
- ✓ 2 Water Coolers installed

Under Process:
- ✓ Renovation of Outer Reading Hall
- ✓ Installation of New Passenger Lift

4.3   IT Infrastructure

4.3.1 Does the university have a comprehensive IT policy with regard to
- • IT Service Management   **Yes**
- • Information Security   **Yes**
- • Network Security   **Yes**
- • Risk Management   **Yes**
- • Software Asset Management   **Yes**
- • Open Source Resources   **Yes**

- Green Computing **Yes**

Computer Network and Usage Policy is placed at Annexure 'K' which will be shown to the NAAC Committee on their visit.

4.3.2 Give details of the university's computing facilities i.e., hardware and software.

# of systems with individual configurations	3500+ approximately
Computer-student ratio	1:3
Dedicated computing facilities	High Performance 16 slot Blade Chassis populated with six Gen8 Blade Servers, 9 Xeon based Rack Servers and 11 Xeon based tower servers. Two (6TB, 4TB) SAN Storages, 1*4 TB NAS Storage. These servers are used to provide computing and infrastructure (Mail, Web, DNS, DHCP, and Squid etc.) services to all campus and public domain users.
LAN facility	Campus Wide Area Network with more than 3500 wired nodes and more than 12000 wireless nodes. All departments are connected to computer centre with Optical Fibre Cable at Gigabit backbone. Few departments are at 10Gigabit backbone and most of them are at 1 Gigabit backbone. The campus network has three access layers with core at computer centre and distribution and access at departments. Two core chassis i.e Alcatel 9800E with 1.4 Tbps switching capacity and Dlink 6500 with 160Gbps switching capacity are deployed at Computer Centre. Panjab University Wireless Network (Wi-Fi) is deployed using two Aruba 6000 Controllers at computer centre and 660 thin indoor access points and 140 outdoor access points across whole campus. The Wi-Fi is running on IEEE 802.11n and is upgradable to IEEE 802.11ac. The computer centre has deployed two UTMs for network and information security i.e WatchGaurd X8500e and FortiGATE 3650B with dedicated log analyzers. A dedicated VPN has been established with regional campuses and affiliated colleges for secure communications.
Proprietary software	MATLAB, Mathematica, SPSS, Windows Server 2012 R2, Windows Server 2008 R2, Windows Server 2003, MS SQL Server 2012, AVG antivirus 2103 Network edition etc.
# of nodes/ computers with internet facility	3500 plus wired nodes + 12000 plus wireless nodes

Any other (please specify)	Panjab University has three WAN Links i.e 155 STM1(1:1) from Reliance, 1 Gbps NKN, 1Gbps BSNL. Panjab University hosts all network services at computer centre. PU has its own Mail Server, Web Server, DNS Servers configured with failover and load balancing. Computer Centre has developed its own software for all PG and UG online admissions. Panjab University has set up virtual classroom which has been integrated to NIC-NKN virtual classroom facility. Panjab University has set its own webcast facility with streaming server and video portal.

4.3.3 What are the institutional plans and strategies for deploying and upgrading the IT infrastructure and associated facilities?

- Creating supercomputing facility to provide a vital tool for an increasing number of researchers for biological and physical systems who need easy access to substantial computing resources.
- To upgrade all classrooms across campus to e-classrooms with latest audio/video integrations.
- Expansion of present Wi-Fi to Sector 25 South Campus academic area and up gradation to IEEE 802.11ac wireless networking standard.

4.3.4 Give details on access to on-line teaching and learning resources and other knowledge and information database/packages provided to the staff and students for quality teaching, learning and research.

Turnitin - Anti-plagiarism software, Webinars PU Web Portal, access to Sakshat, access to NPTEL repository, all subscribed journals by PU central library and all other video/audio lectures are provided in Public domain.

4.3.5 What are the new technologies deployed by the university in enhancing student learning and evaluation during the last four years and how do they meet new / future challenges?

All the students are provided access to Internet resources from various academic buildings and hostels on 24X7 bases. Students can visit any web-site for downloading educational resources and same is monitored by the Computer Center.

4.3.6 What are the IT facilities available to individual teachers for effective teaching and quality research?

All faculty members are provided with Internet facility at their desk. Computer centre helps faculty members to build and setup hardware and software requirements for their research. Computer Centre provides licensed software such

as Matlab, Mathematica and SPSS on LAN for their computational needs. Computer Centre has also made provision for network based AVG – Antivirus Software and Turnitin - Anti plagiarism Software for research.

4.3.7 Give details of ICT-enabled classrooms/learning spaces available within the university? How are they utilized for enhancing the quality of teaching and learning?

Panjab University has established a virtual classroom and has integrated it with NIC-NKN virtual classroom portal. Faculty can record their lecture and place at PU web portal. Students can opt for online classes/courses offered at various institutes connected to NIC virtual classroom portal. University has established 5 smart classrooms across campus. Many classrooms are provided projectors and internet facility.

In the year 2012, four smart class rooms have been set up on the campus in the following locations:

1. Department of Computer Science & Applications (DCSA)
2. University Institute of Engineering and Technology (UIET)
3. University Institute of Chemical Engineering & Technology (UICET)
4. University Business School (UBS)

4.3.8 How are the faculty assisted in preparing computer- aided teaching-learning materials? What are the facilities available in the university for such initiatives?

Teachers can record (audio/video), stream their lectures from virtual classroom established in the computer centre anywhere on the Internet. An online video portal is deployed at computer centre from which recorded lectures are streamed over Internet. Computer Centre conducts training programme on various packages/tools which helps teachers to prepare teaching materials.

For example, USOL has prepared audio talks for a course and made two courses online.

4.3.9 How are the computers and their accessories maintained?

Computer centre has technical man power which deploys, configures, handles day to day computer/network operations and maintains networking equipment. For proprietary hardware like servers, UPS, UTM, University has AMC with various vendors.

4.3.10 Does the university avail of the National Knowledge Network connectivity? If so, what are the services availed of?

Yes, the University has 1Gbps Connectivity effective from April 2009. Internet, Countrywide Virtual Classroom, Collaborative Research (CERN), Domain Name System, Video Portals, Video Streaming, Multipoint Control Unit (MCU) Services are being availed in the campus.

4.3.11 Does the university avail of web resources such as Wikipedia, dictionary and other education enhancing resources? What are its policies in this regard?

Yes. Panjab University IT Policy (mentioned in 4.3.1 above) allows users to access any resource on web except objectionable blocked categories.

4.3.12 Provide details on the provision made in the annual budget for the update, deployment and maintenance of computers in the university.

University is providing Rs 30 lacs per year as recurring cost for Internet bandwidth procurement. University has provided Rs 1 lac for maintenance of Internet/Email Services and including up gradation of UPS for current financial year. University has further provided Rs 890,000/- for repair and maintenance of IT equipment. University has made provision of Rs 5 lacs for software/spectrum licenses.

4.3.13 What plans have been envisioned for the gradual transfer of teaching and learning from closed university information network to open environment?

- ✓ Panjab University is planning a state-of-the-art studio to record lectures on the lines of NPTEL of IITs to be delivered by teachers and made available to students all over the world free of cost.

- ✓ Lectures and tutorials in the forms of power point presentation is also being planned to host on PU web servers, so that these can be accessed in public domain.

- ✓ 91.2 MHz, Jyotirgamaya, the CRS (Community Radio Station) of the Panjab University is being run by the School of Communication Studies for more than a year now. It was inaugurated on 13th February, 2011 and is acting as a unifying agent amongst the university faculty, students and also the community. Having started its journey with just a half-an-hour broadcast per day, today the station proudly offers four broadcasts a day that include a total of nine programs running for over 10 hours.

✓ The aim of setting up the CRS is to impart knowledge and information related to education, health, environment, social, cultural and local issues and announcements specific to the community, and to provide a platform for showcasing the talents and expertise of the local people in the vicinity of the CRS which comprises of 30 villages. The CRS also acts as a training ground for the community and also for the students of electronic media.

✓ The University is also planning to strengthen Education Media Centre at USOL as well as an Educational Multimedia Research Centre (EMMRC) at School of Communication Studies. The EMMRC will be linked with the EMMRCs all over the country for making education more inclusive. The centre will also be able to produce socially relevant documentaries.

4.4 Maintenance of Campus Facilities

4.4.1 Does the university have an estate office / designated officer for overseeing the maintenance of buildings, class-rooms laboratories? If yes, mention a few campus specific initiatives undertaken to improve the physical ambience.

Yes,

i. University has a designated Estate office with its Estate officer as Registrar, Panjab University as Custodian of its Buildings & Campus. However Construction office, Panjab University, Chandigarh under the Headship of Executive Engineer maintain its Building Infrastructure.

ii. University has well maintained Parks, Lawns & sufficient formal open spaces have been provided for the Physical Fitness of its habitants.

iii. University has sufficient number of Children Parks with Playing Equipments and have been provided near each group of residential accommodation.

iv. University has well maintained Play Grounds having required Infrastructure (with modern materials) to fulfil the need of Students from the Physical Education point of View.

v. It has water features like Fountains and Pools around the specific Buildings lend Serene Environment around Major Buildings.

vi. It has well maintained Botanical Garden and Pharmaceutical Garden with required species of Plants as a Part of Campus to facilitate research work in these fields.

Executive-Engineer (Xen) office of the University manages the repair & maintenance works of buildings, open spaces including roads & lawns, class rooms and laboratories.

No approval is required from Chandigarh Administration (UT) for maintenance of its campus in Sector-14 as well as Sector-25.

The Deputy Registrar (Estate) and Registrar of University act as an Estate Officers who have been entrusted the responsibility of taking care of the University land records, campus houses and shops.

A few campus specific initiatives undertaken to improve the physical ambience are placed at Annexure 'L' which will be shown to the NAAC Team on their visit.

4.4.2 How are the infrastructure facilities, services and equipments maintained? Give details.

Panjab University's Construction Office has various wings as follows:-
a) Civil Maintenance wing.
b) Public Health maintenance wing.
c) Electrical maintenance wing.
d) Horticulture maintenance wing
e) Sanitation maintenances wing.

All the wings take care of their responsibilities efficiently under the banner of Construction office.

The University identifies the need for annual maintenance of physical infrastructure and the estimation therein is sought as budget allocation in the beginning of the financial year. Based on the need assessment for proper maintenance of equipment, furniture, laboratories and class rooms, budget provisions are optimally made. The requirements given by the Departments are considered on priority basis while making allocation.

The housekeeping and campus security have been outsourced with a limited contractual obligation. Sophisticated IT equipment and office equipment are covered by annual maintenance contract.

4.4.3 Any other information regarding Infrastructure and Learning Resources which the university would like to include.

Panjab University, Chandigarh has special privilege given by the Chandigarh Administration in which the University has been given the responsibility to create its infrastructure and services entirely of its own in Sector-14 as well as Sector-25.

Engineer Agya Ram, Architect of Excellence and Swiss Architect Pierre Jeanneret under the guidance of his legendary cousin Le Corbusier (the creator of Chandigarh), were assigned the responsibility of designing Panjab University's Architecture. The architecture of whole Chandigarh city was developed separately. Simultaneously, on the other side, the architecture of Panjab University was developed separately. This all depicts in a yellow book (Sethi Book) namely 'Panjab University – 1947-1967'.

After the year 1990, the University has made a tremendous overall growth with new constructions in Sector-14 & Sector-25 in the last twenty years namely Youth Welfare, Music, Emerging Areas in Social Sciences and Sciences. The university has a modern infrastructure, well integrated with old infrastructure. Power lines have been re-wired at selected places which were essential for Laboratories for Computers and other equipment.

There is a need of upgrading overall electrical infrastructure, power lines, electrical lining and modernisation of networking cables. In addition, power requirements of University are also increasing day-by-day. Towards this, the University proposes to have 66 KVA distribution line with a cost of Rs 22 crores of its own.