SELF STUDY REPORT

FOR

2nd CYCLE OF ACCREDITATION

HOMI BHABHA NATIONAL INSTITUTE

HOMI BHABHA NATIONAL INSTITUTE, A DEEMED TO BE UNIVERSITY, 2ND FLOOR, TRAINING SCHOOL COMPLEX ANUSHAKTINAGAR, MUMBAI 400094
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Submitted To

NATIONAL ASSESSMENT AND ACCREDITATION COUNCIL

BANGALORE

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1. EXECUTIVE SUMMARY

1.1 INTRODUCTION

The Department of Atomic Energy (DAE) was established in 1954 and its mandate includes

1. Research, including fundamental research in matters connected with atomic energy and the development of its uses in agriculture, biology, industry and medicine, and

2. Advancement of higher mathematics.

In pursuit of its mandate, DAE has established research and development centres as well as grant-in-aid institutions and has taken in its fold several existing institutions as its grant-in-aid institutions. Together, all institutions under the umbrella of the DAE present a formidable group in terms of expertise in science and engineering with world-class research infrastructure.

DAE has been running a “Training School” since 1957 to provide pre-induction training in nuclear science and engineering to fresh engineers and post-graduates in science joining R&D centres of DAE. Given the depth and range of operation of its programmes, the Training School, in fact, has been functioning as a Graduate School. Similarly, several other Constituent Institutions (CIs) of Homi Bhabha National Institute (HBNI) have had a long tradition of human resource development through academic programs in various disciplines.

Considering the continued expansion of the atomic energy programme and considering the fact that the DAE institutions are engaged in human resource development, the DAE, in consultation with all possible constituent institutions, decided to establish HBNI having the status of a deemed university. HBNI was notified as a deemed to be university on June 3, 2005, and started its academic programmes in 2006. It was accredited by NAAC in 2015, as an “A” grade institution, with a CGPA of 3.53 on a 4-point scale.

HBNI brings together eleven premier institutions of the DAE (four DAE units and seven grant-in-aid institutions), under a single research-driven academic framework. The Institute has a distributed structure and is a unitary deemed to be university. Its CIs have already been carrying out advanced research and development for several decades. Setting up of HBNI has ensured that the DAE scientists and scientific establishments remain at the forefront of the pursuit of excellence in research in science and engineering, comparable with the best global standards.

Vision

The Vision of HBNI isarticulated below:

- To provide an academic framework for integrating basic research with technology development.
- To encourage inter-disciplinary research.
- To nurture an environment for attracting high-quality manpower in the sciences including engineering sciences to take up a career in nuclear science and technology and related areas.

The Core Values of HBNI are:

- **Ethical Conduct:** Always adhere to highest ethical standards in teaching, research and services; resist and relegate dishonesty

- **Student-centric Approach:** Always put good of the students first; keep in mind the good of the student in designing processes and programs.
- **Promote Excellence:** Value excellence in research and foster innovation and creativity; design mechanisms to recognize, encourage and reward excellence; use merit as the only consideration in every process

- **Science for Society:** Recognize the importance of science for the development of society; encourage application of advanced knowledge in sciences including medical and health sciences, to address the needs of the society
- **Focus on National Mission:** Use education and research as tools to meet the needs of the nation in various domains, and particularly nuclear science and technology
- **World Class Education and Research:** Nurture human resources in sciences (including Engineering, Mathematics and Medical & Health Sciences) ; provide access to world class experimental and computational facilities and research problems in frontier areas

Mission

- The Mission of HBNI is to encourage the pursuit of excellence in sciences (including engineering sciences) and mathematics in a manner that has major significance for the progress of indigenous nuclear technological capability.

1.2 Strength, Weakness, Opportunity and Challenges(SWOC)

Institutional Strength

1. Focus on Departmental and National needs in devising programs
2. Decentralized and participative management system with a high degree of flexibility to CIs/OCC to design programs to meet their respective mandate
3. World-class experimental facilities, including unique mega facilities such as nuclear reactors, accelerators, tokamaks etc., and excellent support facilities such as library, computational facilities and discipline-specific modern laboratories.
4. Transparent and rigorous system for student selection, resulting in student population of high quality.
5. Rigorous course work of high standards with a choice-based credit system
6. Academically robust, nationally and internationally renowned faculty; many faculty members have rich experience in research and teaching even at the time of induction.
7. Frontier areas of research, with opportunities of international collaboration
8. High emphasis on merit, very strong peer pressure on both the faculty and the students to excel.
9. High emphasis on ethics and adherence to Government procedures
10. Utilization of results of academic research in the Department’s programs
11. Through its alumni, the Institute is making a valuable contribution to the scientific manpower development in the country. A large number of HBNI alumni occupy positions for implementing hi-tech projects within DAE and in some cases outside, and research and faculty positions in various leading Institutions and Universities.

12. Through the post-graduate and doctoral programs in medical & health sciences, HBNI is contributing significantly to the society by making available a large number of specialists in oncology; HBNI also contributes significantly to skill development in the domains of nursing, radiology, etc.
13. A high faculty to student ratio (0.34 for the academic year 2018-19)
14. Availability of adequate funds from DAE

Institutional Weakness

1. Pursuit of a meritocratic admission policy sometimes leads to a low intake of students.
2. Misplaced apprehensions about nuclear energy deter some students to join the doctoral programme run by the university under the DAE.
3. The embargo on the supply of items subject to technology controls to R&D centres sometimes forces students and faculty to devise alternate instrumentation and equipment leading to delays in research
4. First priority of some of the faculty in the CIs which are R & D units of DAE, is to pursue R&D projects towards mission programs of the department. Due to preoccupation with R&D projects, mentoring of students sometimes gets less priority.
5. Due to the availability of alternate non-academic career options, some of the doctoral students leave research before completion.
6. Students are also engaged in research projects related to strategic programs, and while their contributions are indeed very important for the country, they do not get high ranking in terms of scientometric indicators. Also, faculty and students are not permitted to patent their research products if these pertain to atomic energy.
7. While the research work of faculty and students does contribute to industrial units in DAE, there is limited interaction of students with outside industry and limited emphasis on entrepreneurship.
8. Students and faculty in the DAE units need to work in a high security ambience.

Institutional Opportunity

1. Enhance utilization and appreciation of the unique mega facilities of DAE by making them available for academic research programs
2. Carry out innovative research in unique areas that cannot be attempted by most other institutes in the country (eg. molten salt chemistry, radiation applications, high-temperature thermodynamics, irradiated material properties, etc.) using the world-class infrastructure
3. Build indigenous scientific instruments for research
4. Carry out cross-disciplinary research utilizing the strengths of various CIs/OCC.
5. Carry out high-level research in frontier areas of basic sciences and engineering having application in national programmes.
6. Contribute to resolving technical issues faced in strategic programs, thus adding high utilitarian value to the academic program
7. To enter into international collaboration on nuclear education with leading countries to expand learning opportunities for students and faculty
8. Offer courses on MOOC platform for benefiting students from HBNI as well as other Universities

Institutional Challenge

1. A major fraction of the faculty of HBNI are employees of DAE units tasked with the development of nuclear science and technology. They have to balance their roles as scientists with mission-related responsibilities, and at the same time play an effective role as a mentor and guide for the research students.
2. Similarly, a sizeable fraction of students are employees; they need to address the targets given to them by their organization, besides ensuring that the academic program proceeds without undue delay.
3. The CIs/OCC are distributed through the country, and therefore, day-to-day interaction between faculty or students across the CIs/OCC is only through the use of technology. This introduces delays in evolving common approach in various issues.
4. The geographical constraint mentioned above also makes it difficult for the students to exploit the excellent research infrastructure and knowledgebase available in multiple CIs/OCC.
5. The CIs/OCC were formed at different periods of time, and have a different history, research culture and domain interest. To maintain academic rigor and at the same time, address the diversity of the strengths in different CIs/OCC is indeed a challenge.
6. Due to the special nature of the research domains in DAE, maintaining a strong interface with industry outside of DAE in the research programs is a challenge.
7. Due to the unique characteristics of the university, some of the regulations of statutory bodies need HBNI-specific interpretation for implementation.
8. To publish results of research in strategic topics without compromising on the classified nature of the information.

1.3 CRITERIA WISE SUMMARY

Curricular Aspects

HBNI offers 32 programmes at doctoral and post-graduate levels in several branches of engineering sciences, physical sciences, chemical sciences, life science, medical & health sciences, and mathematical sciences to meet the requirements of nuclear energy development, its societal and strategic benefits, and to meet the National need for a strong intellectual base.

The CIs and OCC of HBNI have been engaged in academic activities over several decades (e.g. post-MSc course in physics at SINP, Training School at BARC). The MSc programs provide a strong foundation to students through core courses, and introduce students to excitements in the frontiers of knowledge in different branches of sciences, before they embark on research in the field of their choice. The research programs are in frontier areas of science and technology, and are on par with similar programs offered by reputed national and international institutions. The courses offered in BARC, IGCAR, VECC, RRCAT and IPR provide an exposure to several special domains of sciences and technology, such as nuclear reactors and fuel cycle, accelerator physics, lasers and plasma science, and prepare students to embark on a career in DAE as well as organisations working on allied fields. The academic programs in Medical and Health Sciences offer a variety of courses that aim at fulfilling the national needs of cancer treatment and research. A variety of diploma programs serve to generate valuable skills in radiation safety and applications.

The courses have been periodically revised, based on advancements in subjects, feedback from stakeholders. New courses have been introduced to expose students to more recent developments. The curriculum has flexibility for the student to learn subjects relevant to his academic program, in the form of elective courses, besides foundation and core courses. Value addition courses are periodically introduced to benefit not only the students but also faculty. The MoUs signed with several eminent institutions enable the students to take courses

in these institutions and earn credits for their coursework. A part of credits can also be earned by taking courses offered in NPTEL or SWAYAM platforms.

Teaching-learning and Evaluation

HBNI adopts a transparent and robust approach for student selection, adhering to Government guidelines as applicable to HBNI. The students are drawn from all over the country. The demand ratio is very high especially for the selection to BARC training schools, with over 1 lakh applications leading to a final selection of around 150 students in various disciplines. The vibrant integrated 5-year M. Sc. Programme at NISER typically receives about 50000 applications from all over India for a final selection of about 200 students for the integrated 5-year M. Sc. Programme.

A significant fraction of the HBNI students are doctoral students. The Doctoral committee of each Ph.D. student has a unique set of domain experts, with specialists drawn also from outside the CI/OCC. The teaching process is student-friendly and provides a high degree of flexibility. The students are mentored with regard to their academic challenges and also any other issue faced by them. The program outcome and course outcome are evaluated to fine tune the program as necessary. Evaluation and result declaration processes have been speeded up, and typically, a Ph.D. student gets his degree well before six months after submission of his thesis.

All faculty of HBNI are Ph.D. degree holders (except for medical and health sciences where faculty are designated as per guidelines of MCI). Faculty of HBNI are internationally acclaimed experts, and several of them are fellows of various academies, Bhatnagar prize awardees and civilian awards. Many of the faculty also play key roles in professional bodies and engage in extension and outreach programs. Since faculty are drawn from practicing scientists and engineers, students not only accumulate knowledge but also develop an understanding of the context and application of knowledge.

Research, Innovations and Extension

The CIs/OCC of HBNI have established world-class facilities and infrastructure for research in frontier areas of basic science, nuclear science and technology and allied domains, and these are extended to the students for their academic programs. The Masters programs in HBNI also provide a research exposure to the students which culminates in the form of a Masters thesis. The facilities are periodically updated to enable DAE to be in the frontline of research. Faculty receive adequate funding for research through DAE projects and get generous support to participate in international conferences. In addition to contributing to projects implemented by DAE, HBNI faculty also provide consultancy to other mission programs of the Government including space, and defence. However, due to the nature of the research domains, there is limited emphasis on patents.

HBNI has zero tolerance to plagiarism and every thesis goes through a plagiarism check. The Code of Ethics of HBNI clearly emphasizes the need for exhibiting the highest levels of integrity. The academic programs of HBNI have led to the publication of a large number of papers by the faculty (over 2500 in 2019) in high impact journals and chapters in books. During the years 2014-15 till 2018-19, 1039 students have received Ph.D. degrees. Some of the CIs (e.g. IMSc, HRI and TMC) also share their lectures/ courses on MOOC platforms. CIs/OCC also organize lecture programs for the benefit of other segments of society and encourage students to participate in these programs.

HBNI and its CIs have functional MoUs with 13 eminent academic organisations, including INSTN, France

and Ghent University, Belgium. Besides research collaborations, these MoUs have also enabled students to take courses in these institutions and earn academic credit.

Infrastructure and Learning Resources

The CIs and OCC of HBNI have excellent infrastructure for academic programs, including class rooms, research laboratories, computing systems, etc. Therefore, the students of HBNI are able to carry out research in areas related to the mission of DAE as well as in frontier areas of science and technology.

All classrooms are equipped with projection facilities; every student gets access to computers, with an average computer/student ratio of 1.3. All campuses have internet connectivity with a bandwidth of 1 GBps or better. Several of the CIs have high-performance computing systems with nationally benchmarked computing speed. The campuses have unique ambience with natural bounty, and all facilities such as ICT enabled seminar halls, auditoria, etc. The students also enjoy the serene and safe atmosphere in the townships/hostel, with excellent sports facilities. The students and faculty are also extended healthcare facilities. High emphasis is placed on maintenance of these facilities through adequate funding.

Libraries at the CIs/OCC have an excellent collection of books, journals, etc., and have a large volume of literature available on the intranet for easy access by faculty and students from their tabletop. BARC library is among the largest libraries in the country in terms of scientific resources. Some of the CIs also have facilities for videocontent creation. For example, IMSc has a dedicated media centre and has hosted a collection of around 900 hours of video content on its web page. IMSc also has a youtube channel (“matscience”) featuring videos on a large number of lectures in mathematics and allied subjects.

Student Support and Progression

Students of HBNI enjoy several benefits. No tuition fee is charged for most of the academic programs. All non-employee students receive fellowships. The meritorious students in the 5-year integrated Masters program receive monthly scholarships from DAE or DST and yearly contingency amount to purchase books etc or carry out a summer research internship. Doctoral students also get yearly contingency amount to purchase books and computers, attend national conferences, to pay membership fees of national bodies, etc., in addition to Fellowships. HBNI provides financial support to Doctoral Students to participate in international conferences to present their papers. CIs/OCC have anti-ragging measures in place, and a grievance cell to address the problems of students.

The PG diploma programs DipRP and DMRIT are so much in demand that all the students are assured of placement. All the M.Tech. students and around 30 % of the doctoral students are DAE employees. More than 90% of students passing out from the masters programs pursue higher education, and many have secured PhD positions in top institutes in India and abroad. Guides of doctoral students also advise them on the post-doctoral career.

Students of HBNI participate in various committees for managing the mess, arranging sports / cultural programs, grievance cell, etc. In NISER, there is a student representative in its Academic Council also. At some CIs, research students also organise meets of research scholars across the country. The students in the masters program also regularly participate and organize events such as inter IISER-NISER sports and cultural meets.

Alumni of HBNI have occupied positions in eminent organisations, and provide academic support as and when required. Being Government-funded organisations, the need for funding from alumni has not been felt and therefore there has been no emphasis on this aspect.

Governance, Leadership and Management

The main objective of HBNI is to provide an academic framework for integrating basic research with technology development. To deal with the diversity of academic programs and R&D goals of the CIs and OCC, HBNI has a unique distributed academic governance mechanism, that ensures that the institutions are able to meet their individual objectives, while adhering to a common set of academic standards. Various bodies of HBNI that take all major decisions regarding the academic processes, have members from all the CIs/OCC, thus implementing participative management. The Council of Management is chaired by Secretary, DAE and has among its members, senior administration officials from DAE Secretariat, to ensure that Government guidelines are followed, and the path of HBNI is in line with its vision and mission. Adequate funding is provided by DAE for the creation and maintenance of infrastructure for research and education, and the utilization of funds is monitored through a financial audit. Several welfare measures such as good accommodation, health care and performance-related incentives have helped in providing an ambience that promotes excellence in faculty. DAE has implemented a merit-based promotion system for the faculty as well as technical staff. National and International collaborations have not only enriched the research programs, but have also brought recognition for the faculty. Quality improvement initiatives are encouraged, including accreditation of labs by NBL / ISO. Over the years, several quality improvement measures have been introduced that have enhanced the satisfaction levels of various stakeholders and also contributed to increase in academic achievements.

Institutional Values and Best Practices

Established in the name of Homi Bhabha, an iconic leader who stood for excellence and indigenous development, HBNI has emphasized these values in every activity. All the CIs/OCC have excellent campuses with emphasis on cleanliness, greenery, waste minimization and recycling, energy-efficient lighting, and adoption of environment-friendly practices. Water conservation measures and rainwater harvesting are implemented in most of the campuses. As eminent, world-class institutions, the CIs/OCC have well-defined procedures for waste management. Regulations of the statutory body with regard to hazardous chemical waste and radioactive waste are followed scrupulously.

HBNI considers merit alone as a factor in designing its processes, and this has ensured that all its students or faculty function in an environment of harmony and equity. The security measures at the campuses provide a safe ambience for women students and faculty. All the CIs/OCC celebrate National festivals, and special commemorative events in the memory of great leaders, promoting National Integration, social harmony and unity. Ethical practices and adherence to constitutional obligations are always given high priority. All CIs/OCC have implemented anti-plagiarism measures. Hindi being the official language of India, students and employees are exhorted to use Hindi in their communications.

The core values of HBNI are in line with the vision of DAE to provide sustainable solutions to society through scientific research. As part of this approach, the high-end facilities available at the CIs/OCC are made available to students for their research needs, and research programs of high value for the society are specifically encouraged.

2. PROFILE

2.1 BASIC INFORMATION

Name and Address of the University	
Name	HOMI BHABHA NATIONAL INSTITUTE
Address	Homi Bhabha National Institute, a deemed to be university, 2nd Floor, Training School Complex Anushaktinagar, Mumbai 400094
City	Mumbai
State	Maharashtra
Pin	400094
Website	www.hbni.ac.in

Contacts for Communication					
Designation	**Name**	**Telephone with STD Code**	**Mobile**	**Fax**	**Email**
Vice Chancellor	P.r. Vasudeva Rao	022-25597638	9566535738	022-25503384	vcoff@hbni.ac.in
IQAC / CIQA coordinator	A.k. Dureja	022-25595398	9969102829	022-25503385	dureja@hbni.ac.in

Nature of University	
Nature of University	Deemed University

Type of University	
Type of University	Unitary

Establishment Details	
Establishment Date of the University	03-06-2005
Status Prior to Establishment,If applicable	Other
Establishment Date	20-01-1957
Any Other, Please Specify	Research Centre under DAE

Recognition Details		
Date of Recognition as a University by UGC or Any Other National Agency :		
Under Section	**Date**	**View Document**
2f of UGC		
12B of UGC		

University with Potential for Excellence	
Is the University Recognised as a University with Potential for Excellence (UPE) by the UGC?	No

Location, Area and Activity of Campus

Campus Type	Address	Location*	Campus Area in Acres	Built up Area in sq.mts.	Programmes Offered	Date of Establishment	Date of Recognition by UGC/MHRD
Main campus	Homi Bhabha National Institute, a deemed to be university, 2nd Floor, Training School Complex Anushaktinagar, Mumbai 400094	Urban	3	2200	Nil		
Institutes	*Institute Of Mathematical Sciences 4th Cross Street, Cit*	*Urban*	*7*	*13800*	*IPhD, PhD*	*03-01-1963*	*03-06-2005*

	Campus , Taramani, Chennai						
Institutes	*Saha Institute Of Nuclear Physics Sector 1/ Af Bidan Nagar, Kolkata 700064*	*Urban*	*13*	*12900*	*PhD*	*11-01-1950*	*03-06-2005*
Institutes	*Harish Chandra Research Institute Chaatnag Road, Jhusi, Allahabad 211019*	*Urban*	*66*	*20000*	*PG, IPhD, PhD*	*19-07-1975*	*03-06-2005*
Off Campus	*National Institute Of Science Education And Research, Thesildhar Office, Kurda, Pipli, Near Jatni, Odisha 752050*	*Semi-urban*	*298*	*115000*	*IMSc, IPhD, PhD*	*28-08-2006*	*08-02-2016*
Institutes	*Institute Of Physics,*	*Urban*	*56*	*27500*	*PhD*	*28-03-1972*	*03-06-2005*

	P.o. Sainik School, Sachivalay Marg, Gajapathinagar, Bhubaneswar, Odisha 751005						
Institutes	*Institute Of Plasma Research, Gandhinagar-ahmedabad Road, Gidc Bhat, Bhat-ahmedabad, Gujarat 382428*	*Urban*	*49*	*24000*	*PG, PhD*	*28-08-1986*	*03-06-2005*
Institutes	*Variable Energy Cyclotron Centre (vecc), 1/af, Bidan Nagar, Kolkata 700064*	*Urban*	*45*	*38700*	*PG, PhD*	*16-06-1977*	*03-06-2005*
Institutes	*Raja Ramanna Centre For Advanced Technology (rrcat), P.o.*	*Urban*	*1770*	*100000*	*PG, PGD, PhD*	*19-02-1984*	*03-06-2005*

	Cat, Indore 452013						
Institutes	*Indira Gandhi Centre For Atomic Research (igcar), Dept. Of Atomic Energy, Kalpakkam 603102*	*Urban*	*1380*	*66000*	*PG, PGD, MPhil, IPhD, PhD*	*30-04-1971*	*03-06-2005*
Institutes	*Tata Memorial Centre, Tata Memorial Hospital, Dr. Ernest Borges Road, Parel, Mumbai 400012*	*Urban*	*63*	*104600*	*PG, PGD, MD, DM, MCh, PhD*	*28-02-1941*	*03-06-2005*
Institutes	*Bhabha Atomic Research Centre, (barc) Trombay, Mumbai 400085*	*Urban*	*2100*	*3000000*	*PG, PGD, MPhil, MD, IPhD, PhD*	*20-01-1957*	*03-06-2005*

2.2 ACADEMIC INFORMATION

Furnish the Details of Colleges of University

Type Of Colleges	Numbers
Constituent Colleges	0
Affiliated Colleges	0
Colleges Under 2(f)	0
Colleges Under 2(f) and 12B	0
NAAC Accredited Colleges	0
Colleges with Potential for Excellence(UGC)	0
Autonomous Colleges	0
Colleges with Postgraduate Departments	0
Colleges with Research Departments	0
University Recognized Research Institutes/Centers	11

Is the University Offering any Programmes Recognised by any Statutory Regulatory Authority (SRA)	: Yes

SRA program	Document
AICTE	104428_4089_1_1594626676.pdf
INC	104428_4089_7_1594357222.pdf
MCI	104428_4089_2_1594637102.pdf

Details Of Teaching & Non-Teaching Staff Of University

Teaching Faculty												
	Professor				Associate Professor				Assistant Professor			
	Male	Female	Others	Total	Male	Female	Others	Total	Male	Female	Others	Total
Sanctioned				412				391				539
Recruited	282	51	0	333	240	76	0	316	354	81	0	435
Yet to Recruit				79				75				104
On Contract	0	0	0	0	0	0	0	0	0	0	0	0

Non-Teaching Staff				
	Male	**Female**	**Others**	**Total**
Sanctioned				6379
Recruited	3527	1482	0	5009
Yet to Recruit				1370
On Contract	7	7	0	14

Technical Staff				
	Male	**Female**	**Others**	**Total**
Sanctioned				12283
Recruited	5276	1000	0	6276
Yet to Recruit				6007
On Contract	3	3	0	6

Qualification Details of the Teaching Staff

Permanent Teachers										
Highest Qualification	**Professor**			**Associate Professor**			**Assistant Professor**			
	Male	Female	Others	Male	Female	Others	Male	Female	Others	Total
D.sc/D.Litt.	4	0	0	0	0	0	0	0	0	4
Ph.D.	246	32	0	212	53	0	336	68	0	947
M.Phil.	0	0	0	0	0	0	0	0	0	0
PG	32	19	0	28	23	0	18	13	0	133

Temporary Teachers										
Highest Qualification	**Professor**			**Associate Professor**			**Assistant Professor**			
	Male	Female	Others	Male	Female	Others	Male	Female	Others	Total
D.sc/D.Litt.	0	0	0	0	0	0	0	0	0	0
Ph.D.	0	0	0	0	0	0	0	0	0	0
M.Phil.	0	0	0	0	0	0	0	0	0	0
PG	0	0	0	0	0	0	0	0	0	0

Part Time Teachers										
Highest Qualification	**Professor**			**Associate Professor**			**Assistant Professor**			
	Male	Female	Others	Male	Female	Others	Male	Female	Others	Total
D.sc/D.Litt.	0	0	0	0	0	0	0	0	0	0
Ph.D.	0	0	0	0	0	0	0	0	0	0
M.Phil.	0	0	0	0	0	0	0	0	0	0
PG	0	0	0	0	0	0	0	0	0	0

Distinguished Academicians Appointed As

	Male	**Female**	**Others**	**Total**
Emeritus Professor	3	0	0	3
Adjunct Professor	39	5	0	44
Visiting Professor	9	3	0	12

Chairs Instituted by the University

Sl.No	Name of the Department	Name of the Chair	Name of the Sponsor Organisation/Agency
1	Chemical Sciences	Nil	Nil
2	Engineering Sciences	Nil	Nil
3	Life Scienecs	Nil	Nil
4	Mathematical Sciences	Nil	Nil
5	Medical Health Sciences	Nil	Nil
6	Physical Sciences	Nil	Nil
7	Applied Systems Analysis	Nil	Nil

Provide the Following Details of Students Enrolled in the University During the Current Academic Year

Programme		From the State Where University is Located	From Other States of India	NRI Students	Foreign Students	Total
Pre Doctoral (M.Phil)	Male	0	1	0	0	1
	Female	0	0	0	0	0
	Others	0	0	0	0	0
Post Master's (DM,Ayurveda Vachaspathi,M. Ch)	Male	25	85	0	0	110
	Female	7	24	0	0	31
	Others	0	0	0	0	0
Doctoral (Ph.D)	Male	487	750	0	0	1237
	Female	238	289	0	0	527
	Others	0	0	0	0	0
PG Diploma recognised by statutory authority including university	Male	12	29	0	0	41
	Female	4	13	0	0	17
	Others	0	0	0	0	0
PG	Male	86	253	0	0	339
	Female	104	84	0	0	188
	Others	0	0	0	0	0

Does the University offer any Integrated Programmes?	Yes
Total Number of Integrated Programme	8

Integrated Programme	From the State where university is located	From other States of India	NRI students	Foreign Students	Total
Male	256	273	0	0	529
Female	78	67	0	0	145
Others	0	0	0	0	0

Details of UGC Human Resource Development Centre, If applicable

Year of Establishment	Nill
Number of UGC Orientation Programmes	0
Number of UGC Refresher Course	0
Number of University's own Programmes	0
Total Number of Programmes Conducted (last five years)	0

Accreditation Details

Cycle Info	Accreditation	Grade	CGPA	Upload Peer Team Report
Cycle 1	Accreditation	A	3.53	Peer Team Review Report 2015.pdf
Cycle 2	Accreditation	A+	3.4	

2.3 EVALUATIVE REPORT OF THE DEPARTMENTS

Department Name	Upload Report
Chemical Sciences	View Document
Engineering Sciences	View Document
Life Sciences	View Document
Mathematical Sciences	View Document
Medical And Health Sciences	View Document
Physical Sciences	View Document
Studies For Applied Systems Analysis	View Document

Extended Profile

1 Program

1.1

Number of programs offered year-wise for last five years

2018-19	2017-18	2016-17	2015-16	2014-15
32	33	31	31	31

File Description	Document
Institutional data in prescribed format	View Document

1.2

Number of departments offering academic programmes

Response: 7

2 Students

2.1

Number of students year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
3165	3235	3210	3106	2889

File Description	Document
Institutional data in prescribed format	View Document

2.2

Number of outgoing / final year students year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
677	618	590	601	475

File Description	Document
Institutional data in prescribed format	View Document

2.3

Number of students appeared in the University examination year-wise during the last five years

2018-19	2017-18	2016-17	2015-16	2014-15
3024	3101	3003	2840	2585

File Description	Document
Institutional data in prescribed format	View Document

2.4

Number of revaluation applications year-wise during the last 5 years

2018-19	2017-18	2016-17	2015-16	2014-15
2	1	1	1	1

3 Teachers

3.1

Number of courses in all programs year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
1145	1135	1070	1063	1054

File Description	Document
Institutional data in prescribed format	View Document

3.2

Number of full time teachers year-wise during the last five years

2018-19	2017-18	2016-17	2015-16	2014-15
1084	1101	1038	1004	964

File Description	Document
Institutional data in prescribed format	View Document

3.3

Number of sanctioned posts year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
1342	1351	1301	1272	1242

File Description	Document
Institutional data in prescribed format	View Document

4 Institution

4.1

Number of eligible applications received for admissions to all the programs year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
247240	222724	220640	237148	110998

File Description	Document
Institutional data in prescribed format	View Document

4.2

Number of seats earmarked for reserved category as per GOI/State Govt rule year-wise during last five years

2018-19	2017-18	2016-17	2015-16	2014-15
101	87	65	57	49

File Description	Document
Institutional data in prescribed format	View Document

4.3

Total number of classrooms and seminar halls

Response: 182

4.4

Total number of computers in the campus for academic purpose

Response: 5040

4.5

Total Expenditure excluding salary year-wise during last five years (INR in Lakhs)

2018-19	2017-18	2016-17	2015-16	2014-15
73685	68201	57421	44311	43029

4. Quality Indicator Framework(QIF)

Criterion 1 - Curricular Aspects

1.1 Curriculum Design and Development

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme Specific Outcomes(PSOs) and Course Outcomes(COs) of the Programmes offered by the Institution.

Response:

The vision of HBNI is to design and offer academic programmes, integrating basic research with technology development to meet national needs in various domains, particularly in nuclear science and technology. To realize the vision, HBNI is offering programmes that aim at: (i) building the required R&D manpower for DAE in nuclear technology and other related high priority areas, (ii) generating high quality human resources in various disciplines of sciences (including engineering sciences) and mathematics to meet the national requirement of manpower in diverse domains, iii) generating professionals in the area of cancer treatment and research, and (iv) generating technical manpower to meet the demands of society in the area (i) and (iii). HBNI has developed unique programmes at postgraduate levels, many of them first of their kind in India, to meet these mandates.

BARC Training schools at Mumbai, Kalpakkam, Hyderabad and Indore run courses in a variety of disciplines that cater to PhD, MTech., MPhil, MSc(Engg) as well as Post-graduate diploma programs. These courses, while having common overall format, are also designed to focus on the mission needs of the concerned centers. For example, courses at IGCAR, Kalpakkam focus on the needs of the fast reactor program, while courses at RRCAT focus on the needs of the accelerator program. Since many of the vital domains of activity in DAE are multidisciplinary in nature (eg. Nuclear fuel cycle, accelerator science), courses are also designed to give a multidisciplinary flavor by introducing the science as well as technology elements. The curriculum also caters to M.Tech students from defence organisations, who get trained to engage in associated defence programs through exposure to elements of nuclear technology and radiation safety.

Cancer research in the direction of early diagnosis and treatment is the need of the hour, with the continuing rise of cancer cases in the country. The academic programs in Medical and Health sciences offer courses for a variety of specialties and super-specialties that aim at fulfilling the national needs of expertise and knowledge base in this vital domain, PhD programs in Medical & Health Sciences as well as Life sciences address research towards understanding, preventing and treating cancer.

Applications of radioactivity and various types of radiation are steadily increasing in India, in a number of industries and particularly in healthcare industry. HBNI is running several programs to address the need of experts in safe handling as well as applications of radiation and radioactivity. The programs DipRP (Diploma in Radiation Protection), DMRIT (Diploma in Medical Radioisotope Techniques) and PGDFIT (Post Graduate Diploma in Fusion Imaging Technology) have generated a pool of experts who serve various hospitals and industries.

While designing the above programs, it is also ensured that the programs offered at HBNI are at par with similar programmes offered by other reputed institutes. Periodic revision of the syllabus and introduction

of new courses are carried out to stay in tune with the latest developments.

File Description	Document
Link for Additional information	View Document

1.1.2 Percentage of Programmes where syllabus revision was carried out during the last five years.

Response: 75.76

1.1.2.1 **How many Programmes were revised out of total number of Programmes offered during the last five years**

Response: 25

1.1.2.2 **Number of all Programmes offered by the institution during the last five years.**

Response: 33

File Description	Document
Minutes of relevant Academic Council/BOS meeting	View Document
Institutional data in prescribed format	View Document
Details of Programme syllabus revision in last 5 years	View Document
Any additional information	View Document

1.1.3 Average percentage of courses having focus on employability/ entrepreneurship/ skill development offered by the institution during the last five years

Response: 2.55

1.1.3.1 Number of courses having focus on employability/ entrepreneurship/ skill development year-wise during the last five years

2018-19	2017-18	2016-17	2015-16	2014-15
10	65	7	9	49

File Description	Document
Programme/ Curriculum/ Syllabus of the courses	View Document
Minutes of the Boards of Studies/ Academic Council meetings with approvals for these courses	View Document
Institutional data in prescribed format	View Document
Any additional information	View Document

1.2 Academic Flexibility

1.2.1 Percentage of new courses introduced of the total number of courses across all programs offered during the last five years.

Response: 12.23

1.2.1.1 **How many new courses were introduced within the last five years.**

Response: 140

1.2.1.2 **Number of courses offered by the institution across all programmes during the last five years.**

Response: 1145

File Description	Document
Minutes of relevant Academic Council/BOS meeting	View Document
Institutional data in prescribed format	View Document

1.2.2 Percentage of Programmes in which Choice Based Credit System (CBCS) / elective course system has been implemented (Data for the latest completed academic year).

Response: 78.13

1.2.2.1 **Number of Programmes in which CBCS / Elective course system implemented.**

Response: 25

File Description	Document
Minutes of relevant Academic Council/BOS meetings	View Document
Institutional data in prescribed format	View Document
Any additional information	View Document

1.3 Curriculum Enrichment

1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics ,Gender, Human Values ,Environment and Sustainability into the Curriculum

Response:

The academic programmes of HBNI are primarily designed to develop human resources in the domain of nuclear science and technology and allied subjects including mathematics. However, in order to enable a wholesome development of the student, HBNI provides exposure to important issues such as gender sensitivity, consciousness of environment, sustainability and most importantly, professional ethics.

In order to create the right mindset among the students towards issues related to gender, CIs/OCC organise lectures by experts in the field of gender sensitization. Lectures by senior scientists are also organised to educate the students about ethical practices in the conduct of scientific research. Some of the issues covered are plagiarism (including self-plagiarism) and attributing authorship of papers to individuals based on their contributions. Additionally, workshops are conducted with the help of Administrative Training Institute of DAE to brief students as well as faculty about correct and ethical practices. The curriculum for research students includes a mandatory course on Research Methodology, which is designed to include aspects of professional ethics. This course also touches upon issues of morality and related Human values. For issues pertaining to the gender sensitivity and environment and sustainability, various related activities (International women's day celebration, tree plantation, and cleanliness drives) are regularly organized for students and faculty members.

For the indigenous development of nuclear science and technology, the emphasis on sustainable development, environmental impact and safety are important cross cutting issues. The majority of students who pursue post-graduate and doctoral programs in the R &D units of DAE come from outside the DAE environment. Accordingly, the courses run at the DAE units such as BARC, IGCAR, VECC and RRCAT create adequate awareness on safety issues among the students. Chemical safety, radiation safety, reactor safety and industrial hygiene are dealt with in detail in the courses at introductory level as well as advanced level. Sustainability and environment protection are therefore, invariably knitted into courses. In fact, one specific program run in BARC is PG diploma in Radiation Physics addressing radiation protection. BARC Training School also runs a program on Radiation Safety which includes courses on Environmental chemistry, Environmental Impact Assessment methodologies, Environment modelling, Radiation risk assessment and Epidemiology.

As part of programs in Medical and Health sciences, regular courses are held on imparting training in Good Clinical Practice and following ethical principles in the clinic and in the conduct of clinical research. It is mandatory for all postgraduate students to undergo certificate training in Good Clinical Practice. The PG Diploma and doctoral programs in biology also include courses on bioethics. All efforts are made in the clinics to maintain patient confidentiality and privacy. TMC also conducts lectures on medical humanities.

File Description	Document
Upload the list and description of the courses which address the Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum	View Document
Any additional information	View Document

1.3.2 Number of value-added courses for imparting transferable and life skills offered during last five years.

Response: 74

1.3.2.1 **How many new value-added courses are added within the last five years.**

Response: 74

File Description	Document
Institutional data in prescribed format	View Document
Brochure or any other document relating to value added courses	View Document

1.3.3 Average Percentage of students enrolled in the courses under 1.3.2 above.

Response: 13.62

1.3.3.1 **Number of students enrolled in value-added courses imparting transferable and life skills offered year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
346	379	396	507	485

1.3.4 Percentage of students undertaking field projects / research projects / internships (Data for the latest completed academic year).

Response: 52.61

1.3.4.1 **Number of students undertaking field projects or research projects or internships.**

Response: 1665

File Description	Document
List of Programmes and number of students undertaking field projects research projects/ / internships (Data Template)	View Document
Any additional information	View Document
Link for additional information	View Document

1.4 Feedback System

1.4.1 Structured feedback for design and review of syllabus – semester-wise / year-wise is received from 1) Students, 2) Teachers, 3) Employers, 4) Alumni

Response: B. Any 3 of the above

File Description	Document
URL for stakeholder feedback report	View Document
Institutional data in prescribed format	View Document
Action taken report of the University on feedback report as stated in the minutes of the Governing Council, Syndicate, Board of Management (Upload)	View Document

1.4.2 Feedback processes of the institution may be classified as follows:

Response: A. Feedback collected, analysed and action taken and feedback available on website

File Description	Document
URL for feedback report	View Document
Institutional data in prescribed format	View Document

Criterion 2 - Teaching-learning and Evaluation

2.1 Student Enrollment and Profile

2.1.1 Demand Ratio (Average of last five years)

Response: 253.82

2.1.1.1 **Number of seats available year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
860	754	816	881	757

File Description	Document
Demand Ratio (Average of Last five years) based on Data Template upload the document	View Document

2.1.2 Average percentage of seats filled against reserved categories (SC, ST, OBC, Divyangjan, etc.) as per applicable reservation policy during the last five years (Excluding Supernumerary Seats)

Response: 94.51

2.1.2.1 **Number of actual students admitted from the reserved categories year wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
94	78	62	55	48

File Description	Document
Average percentage of seats filled against seats reserved (Data Template)	View Document
Any additional information	View Document

2.2 Catering to Student Diversity

2.2.1 The institution assesses the learning levels of the students and organises special Programmes for advanced learners and slow learners

Response:

HBNI recognizes that the learning programs have to be adequately flexible and provide for different pace of learning among students. Accordingly, the CIs/OCC of HBNI have schemes to cater to advanced learners as well as slow learners.

For MSc and Integrated MSc programmes, option of credit overload is available for advanced learners. Under this option, if a student has CGPA >= 8.0, credit overload of a 4 credit course is permissible in a semester. However, performance of such students is carefully monitored by the Dean-Academic/academic committee so that the student is under no stress. Such students are also given an option at the beginning of a course for waiver. If a student feels that a course is a just repetition for him/her, the student can be exempted from attending the course after clearing a designated test. The student can utilize this period to study an advanced audit course from any department guided by the academic committee and as per the student's interest. In some cases, the student can also be permitted to be absent from the regular lectures, but submit assignments/projects, and take the tests.

Slow learners in the integrated MSc program are also permitted to opt for credit underload as well as remedial / bridge courses during summer vacation to bring parity amongst student population. In case of a credit underload, the duration of the overall academic programme is accordingly extended with the upper limit of 2 years. Students are also permitted to improve their performance in mandatory core courses by repeating the courses up to three times. Students also have the option to replace a particular elective course with another to improve their grades. For the 1st year students who fail in any of the courses, NISER has introduced Supplementary Examinations twice in an Academic Year during the summer and winter vacation.

The MTech (Engineering Physics) programme at RRCAT is open to both engineering (BE/ BTech. passed) and physics (MSc passed) students. To accommodate the different entry level qualification of the two categories, bridge courses are designed and offered to the students. The bridge courses are followed by one semester of compulsory core courses, and then in the final semester the students take several specialized courses with emphasis on the science and technology of lasers and accelerators. For all the students, a second chance is given after 3 weeks of the end semester to clear a course, if needed or to improve marks in certain cases.

It is the practice at the BARC Training Schools to organise courses on advanced topics under the 'QUEST' programme. Some of the topics in which 'QUEST' courses have been organised in the recent past are Earthquake Engineering, Linear Control Systems, Theory and Advanced Computational Physics. These courses provide motivation to the bright students to broaden their domains of learning. For the weaker students, the BARC Training schools also have provision to repeat a course in training school and appearance in re-examination.

2.2.2 Student - Full time teacher ratio (Data for the latest completed academic year)

Response: 3:1

2.3 Teaching- Learning Process

2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

Response:

All the CIs/OCC of HBNI adopt student-centric pedagogies that provide the student a memorable learning experience. HBNI being a research University, most of the students are required to adopt a participative, hands-on approach to learning. Discussion sessions further enhance the learning experience to help the students become independent researchers. The coursework for doctoral students, in most cases, involves credit seminars and annual reviews, which provide students the challenge of not only learning a subject but also developing their communication skills, and provide them opportunities to have discussions with peers and experts. Doctoral students are also encouraged to take up self-study courses and discuss their understanding with the mentor / doctoral committee on a regular basis.

The courses offered by HBNI invariably have tutorials and assignments that help students in problem-solving. The PG Diploma programs run in BARC Training Schools in various CIs include a mini-project of 2 months, ending with a presentation to an expert committee. A guide is associated with the mini-project to mentor the student to understand the critical components of the project and the approaches to handle a technical problem at hand. The end-semester viva voce exams assess the student's ability for integration of knowledge of various subjects acquired during the semester. The students of medical and health sciences are exposed to hands-on activities (Supervised Surgery, Radiation therapy treatment planning, Chemotherapy administration, etc.) and also management of side effects and sequelae of treatment. The students are also exposed to the management of medical emergencies in the operating room and clinics.

HBNI strongly encourages "study tour" of its students to other research centers of DAE. The students of the PG diploma programs in nuclear science and technology, in particular, have a study tour built in as part of their curriculum, which provides a great deal of experiential learning. During such tours, students are exposed to unique research facilities available in the research centers, and encouraged to interact with scientists and students in the different environment.

In the case of medical and health sciences, the structured teaching programs include discussions based on personal experiences of the teachers. Students are encouraged to participate in case discussions and debates in the wards and also in the day-to-day clinics. In para-medical specialties, the students are posted in rotation to various areas of learning to acquire experience and necessary skills.

HBNI provides financial assistance to PhD scholars for attending international conferences to present their work, interact with peers and experts and discuss their work to get further inputs. Such participation in conferences aids in participative learning of advanced subjects through discussions with experts. Students are also encouraged to participate in pre-synopsis viva voce and the final defence examination of other students, ask questions and learn from the discussions, in order to fine tune their own thesis and communication skills. Research scholars are also encouraged to organize technical meets to gain organizational experience, under the guidance of the experts.

2.3.2 Teachers use ICT enabled tools including online resources for effective teaching and learning process.

Response:

This is the age of digital learning- while conventional blackboard teaching has still its merits, the

techniques of teaching have evolved in digital format, with the availability of several types of ICT resources, offering several advantages. All the institutions of HBNI have implemented ICT based teaching. Classrooms are equipped with LCD projector facility and internet connectivity. The CIs/OCC have auditorium with state-of-the art facilities for projection and recording. The CIs are linked with HBNI central office by videoconferencing, through a dedicated network “Anunet”. At the Central Office, a videoconferencing facility that can connect simultaneously to over 10 other sites has been established in 2019. This has been extensively used subsequently to organise value added courses, webinars, doctoral committee meetings, credit seminars, etc.

Faculty members of HBNI use online resources for effective teaching and learning. There are a large number of scientific and engineering computer codes available in public domain as online resources which are used for this purpose. Some of the examples of such codes are finite element codes for structural, thermal, electro-magnetic and material modelling; codes for reactor physics calculations; radiation damage calculation (eg. SHRIMP code); simulation of material properties code (VASP, CASTEP); codes related to geo-physics and geo-technical calculations; codes for assessment of migration of radio-nuclides in atmosphere and water bodies; general ab initio quantum chemistry package for electronic structure calculations; ab-initio simulation package with pseudopotential; Carr-Parrinello molecular dynamics package, thermochemical modeling packages, etc. Students are exposed to use of such codes for modelling and simulation, as part of the curriculum and research.

Some CIs and in particular, the Institute of Mathematical Sciences (IMSc), have established multi-functional facilities to handle video conferencing and web streaming, Video recordings and meetings. These have enhanced the impact of teaching in the sense that students from other CIs can also benefit from such lecture programs. Using this unique facility, IMSc has hosted a large number of video lectures and courses in mathematics, physics and computational biology, in its website http://ekalavya.imsc.res.in, and also hosted them in the youtube channel “MATSCIENCE”. This channel is a highly sought-after e-resource for lectures on advanced mathematics, not only by the HBNI-IMSc faculty but also several visiting faculty including foreign faculty. At IGCAR, a similar “smart class” room with videoconferencing / videorecording facilities has been established.

At HBNI, an Anunet website “Pathshala” (http://pathshala.anunet.in) has been set up, which hosts course content obtained on a variety of subjects from NPTEL, as well as lectures videographed by HBNI. The students across the CIs benefit from this resource.

File Description	Document
Upload any additional information	View Document
Provide link for webpage describing the " LMS/ Academic management system"	View Document

2.3.3 Ratio of students to mentor for academic and other related issues (Data for the latest completed academic year)

Response: 4:1

2.3.3.1 **Number of mentors**

Response: 816

File Description	Document
Upload year wise, number of students enrolled and full time teachers on roll.	View Document
mentor/mentee ratio	View Document
Circulars pertaining to assigning mentors to mentees	View Document

2.4 Teacher Profile and Quality

2.4.1 Average percentage of full time teachers against sanctioned posts during the last five years

Response: 79.72

File Description	Document
Year wise full time teachers and sanctioned posts for 5 years	View Document
List of the faculty members authenticated by the Head of HEI	View Document

2.4.2 Average percentage of full time teachers with Ph.D./D.M/M.Ch./D.N.B Superspeciality/D.Sc./D'Lit. year-wise during the last five years

Response: 90.14

2.4.2.1 **Number of full time teachers with *Ph. D. / D.M. / M.Ch. / D.N.B Superspeciality / D.Sc. / D.Litt.* year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
992	999	933	898	859

File Description	Document
List of number of full time teachers with Ph D/D M/M Ch/D N B Superspeciality/DSc/D Lit and number of full time teachers for 5 years	View Document

2.4.3 Average teaching experience of full time teachers in the same institution (Data for the latest completed academic year in number of years)

Response: 6.75

2.4.3.1 **Total experience of full-time teachers**

Response: 7317

File Description	Document
List of Teachers including their PAN, designation, dept and experience details	View Document

2.4.4 Average percentage of full time teachers who received awards, recognition, fellowships at State, National, International level from Government/Govt. recognised bodies during the last five years

Response: 13.58

2.4.4.1 **Number of full time teachers receiving awards from state /national /international level from Government/Govt. recognized bodies year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
34	30	26	29	22

File Description	Document
Institutional data in prescribed format	View Document
e-copies of award letters (scanned or soft copy)	View Document

2.5 Evaluation Process and Reforms

2.5.1 Average number of days from the date of last semester-end/ year- end examination till the declaration of results year-wise during the last five years

Response: 23.54

2.5.1.1 **Number of days from the date of last semester-end/ year- end examination till the declaration of results year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
25.25	26.30	26.71	19.89	19.53

File Description	Document
List of Programmes and date of last semester and date of declaration of results	View Document
Any additional information	View Document

2.5.2 Average percentage of student complaints/grievances about evaluation against total number appeared in the examinations during the last five years

Response: 0.02

2.5.2.1 **Number of complaints/grievances about evaluation year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
2	1	0	0	0

File Description	Document
Number of complaints and total number of students appeared year wise	View Document
Any additional information	View Document

2.5.3 IT integration and reforms in the examination procedures and processes (continuous internal assessment and end-semester assessment) have brought in considerable improvement in examination management system of the institution

Response:

The examination process adopted in CIs/OCC of HBNI depends on the academic program, and has a high degree of flexibility, ranging from closed book, closed notes exams to open book, indefinite time exams. This flexibility has helped in tapping creative potentials among students.

The examination system for the Ph.D students ensures that the student acquires a broad base of knowledge related to his field of work, and originality and innovation in the research. An Open General Comprehensive Examination after completion of the coursework, annual reviews by a student-specific doctoral committee, an open pre-synopsis viva to confirm adequate quantity and quality of work and independent, critical and robust evaluation of the thesis ensure the quality of the research as well as that of the thesis. The evaluation process for the thesis was fine tuned and the ordinances modified to permit the Deans to contact three reviewers simultaneously and proceed for viva voce examination based on first two positive results. For the viva voce, participation of one of the examiners through videoconference mode has been permitted. These steps have helped in ensuring that after the submission of the thesis, the process of evaluation, viva voce and declaration of result are completed within a time period of around 6 months.

The students pursuing M.Tech/ PGDNS programs do their coursework in the BARC Training Schools. The written examination for selection of students is fully ICT based, to handle the large number of applicants from all over India (over 1.5 lakhs). The progress of learning in the Training Schools is regularly assessed through assignments, presentations, and periodic examinations for classroom and laboratory courses as well as a miniproject and two (mid-term and final) viva voce examinations. Additionally, students are also given assignments, and tutorials are conducted to carry out continuous evaluation. The examination process has been streamlined with the introduction of several measures such as a monitoring system for tracking the receipt of results and online communication to students of the updated results. Mark sheets and certificates are generated by Trainee Management System (TMS) portal. Before declaring the results, the answer papers for every subject are shown to them and any change or alteration, if needed is made.

The Integrated MSc program offered at NISER involves written and practical examinations at different stages. Examinations for theory courses consist of: (i) continuous assessment, running over the entire semester and with typical weightage of 30%, (ii) mid-semester examination with a typical weightage of 30% and (iii) end-semester examination with 40% weightage. The weightage of the different components is mandatorily announced to the students by the course instructors. The continuous assessment includes quizzes, assignments and presentations etc. Laboratory examinations consist of continuous assessment (weightage of 60%) and end semester examination (40% weightage). In the 5th year of the programme more emphasis is given on a year-long research oriented project, which is evaluated by a committee based on a project report and presentation by the student.

File Description	Document
Year wise number of applications, students and revaluation cases	View Document

2.5.4 Status of automation of Examination division along with approved Examination Manual

Response: 100% automation of entire division & implementation of Examination Management System (EMS)

File Description	Document
Current manual of examination automation system and Annual reports of examination including the present status of automation	View Document
Current Manual of examination automation system	View Document

2.6 Student Performance and Learning Outcomes

2.6.1 The institution has stated learning outcomes (generic and programme specific)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents

Response:

The academic programmes offered by HBNI can be divided into three categories: Professional programmes (MTech., PG Diploma, DipRP, MD, DM, MCh, MSc (Nursing), DMRIT etc.), Research orientated programmes (MSc(Engg), MPhil, Integrated PhD. and PhD), and Science education programmes (integrated MSc and MSc). Many of the programmes are conducted at more than one Constituent Institutions (CIs)/ Off-Campus Centre (OCC). In every case, the design of the programmes aims at a wholesome development of the student, preparing him/her to undertake a challenging career.

Professional programmes (PG Diploma and MTech) offered by HBNI prepare students for a lifelong career in DAE, including working for large hi-tech projects, undertaking activities such as design, construction, quality assurance or operation. The programme outcomes (POs) and the programme specific outcomes (PSOs) are therefore, in line with the DAE mission and strategic projects. Accordingly, all the courses offered and their projected outcomes are also in conformity with DAE requirements.

The outcomes from all the other programmes offered by HBNI are also formulated carefully, maintaining their generic nature and preparing the student for a rewarding scientific career with the confidence to migrate to other challenging areas if necessary. Although some of the programmes are conducted at more than one CIs/OCC, the POs are maintained the same for a particular programme. But, the PSOs are formulated differently, after taking into account the domain area of the specific programme and the thrust area of the CI/OCC offering the programme. The courses offered are mainly of three types: Foundation, Core and Elective. These courses, their formulated syllabi and outcomes are related to one or more POs and PSOs. HBNI lays a lot of emphasis on the development of analytic and problem-solving skills. The domain knowledge as well as strong basic concepts in other related areas prepare the students to take up the challenging research problems in multidisciplinary fields. These are clearly stated in the PSOs and the course outcomes.

The outcome of the courses is assessed through quiz tests, assignments, seminars, oral examinations and end-semester/tri-semester examinations. For the post-graduate medical programme, the combination of both formative and summative assessment is vital for the successful completion of the programme. The learning experience derived by the students from their ward visits and treatments to the patients under the guidance of the mentor is assessed, and it forms the major part of their programme outcomes. Information on the POs and PSOs of all the programmes, and syllabi of the various courses offered under the given programme along with their outcome is made available on the HBNI website for the benefit of all the stakeholders.

File Description	Document
Upload COs for all courses (exemplars from Glossary)	View Document
Paste link for Additional Information	View Document

2.6.2 Attainment of Programme outcomes, Programme specific outcomes and course outcomes are evaluated by the institution

Response:

HBNI is a Research University established by DAE as an academic tool to develop indigenous strengths in nuclear science and technology. HBNI and DAE have been closely monitoring the results of the academic programs to assess whether the mandates have been met by the programs. Parameters such as publications in journals and development of new processes and products for the Department's program and for societal needs have been taken as broadly indicative of the attainment of the objectives of the academic program. In the context of HBNI as a Deemed University, the methodology to be adopted for measuring the level of attainment of POs, PSOs and COs in quantitative terms was discussed in the IQAC, and based on its suggestions, a methodology based on the aggregate percentage of marks/CGPA was adopted for the measurement, except for the Research Orientated Programmes. It was decided to consider all POs, PSOs and COs in the particular programme to be of equal weightage and the attainment level in POs, PSOs and COs as equal to the programme level attainment. The programme level attainment on the scale of 1 to 3 was approved with the following methodology for calculation of level attainment for the programmes, in which the aggregate percentages are awarded.

Minimum pass % <= aggregate % < Minimum pass % + 5% , then Level=1

Minimum pass % + 5% <= aggregate % < Minimum pass % + 10%, then Level=2

Minimum pass % + 10% <= aggregate %, then Level=3

For the programmes in which grade point average system on a ten-point scale is implemented, the below mentioned level attainment formula was approved.

Qualifying CGPA to pass <= CGPA obtained < Qualifying CGPA +1, then Level=1

Qualifying CGPA +1 <= CGPA obtained< Qualifying CGPA +2, then Level=2

Qualifying CGPA +2 <= CGPA obtained, then Level=3

Program level attainment = Summation (niLi /N), where ni is the number of students attaining the Level 'i' and 'N' is the total number of students in the programme.

% Program level attainment = (Program level attainment/3) x100

Research orientated programmes, such as M.Sc.(Engg), M.Phil., Integrated Ph.D. and Ph.D., are expected to impart advance knowledge in theory and experimental/computational techniques in the domain and related areas of the research problem, and development of analytical and critical thinking skills for solving complex applied/fundamental problems. Attainment of the non-research aspects is judged during the course work, practical and viva voce for M.Sc.(Engg) and M.Phil students. The Ph.D. students are judged at various stages by Oral General Comprehensive Examination, the number and quality of publications in conferences and refereed journals, pre-synopsis viva, and thesis examination by two external examiners. For all the research-orientated programmes, the degree is awarded only after the thesis work is successfully defended. Due to stringent criteria for passing the various performance assessment tests, all the degree holders in this category can be considered to have obtained the program attainment of 100%.

2.6.3 Pass Percentage of students(Data for the latest completed academic year) **Response:** 98.83	
2.6.3.1 Total number of final year students who passed the examination conducted by Institution. Response: 677	
2.6.3.2 **Total number of final year students who appeared for the examination conducted by the Institution.** Response: 685	
File Description	**Document**
Upload list of Programmes and number of students passed and appeared in the final year examination	View Document
Paste link for the annual report	View Document

2.7 Student Satisfaction Survey

2.7.1 Online student satisfaction survey regarding teaching learning process **Response:** 2.86	
File Description	**Document**
Upload database of all currently enrolled students	View Document

Criterion 3 - Research, Innovations and Extension

3.1 Promotion of Research and Facilities

3.1.1 The institution Research facilities are frequently updated and there is well defined policy for promotion of research which is uploaded on the institutional website and implemented

Response:

The CIs/OCC of HBNI are organisations with a long tradition of research in frontier areas of science and technology, particularly related to nuclear energy. All CIs/OCC have a strong component of research in addition to education and training. A significant fraction of students of HBNI are in fact, research scholars pursuing Ph.D and other research-based programs. Research is pursued with sophisticated instruments and complex experimental facilities set up in-house for specific research programs. Being at the forefront of research in the country as well as globally, the organisations under the umbrella of HBNI update their experimental facilities on a regular basis, based on the research needs. The research problems selected are all based on the mission of the individual CIs/OCC; however, since all funding is given by DAE, the broad contour of programs is also approved by DAE. Thus, the overall research promotion policy is decided by DAE. Within this envelope, the individual CIs/OCC pursue research goals consistent with their mission and strengths. Adequate funding is provided by DAE to all the institutions under its umbrella, and therefore, the institutions do not face constraints for upgrading the research facilities periodically. Such upgradation is done through capital projects, which enable both addition of new facilities, as well as refurbishing or updating existing facilities. For the promotion of research, an organisational incentive scheme is implemented, which encourages multidisciplinary mission-oriented research.

The core function of HBNI is to promote multidisciplinary research in domains of relevance to nuclear energy development and other societal needs. HBNI integrates the academic activities at the CIs and OCC under one framework and provides students opportunities to utilise the state-of-art research facilities as well as expertise available in all its CIs/OCC. HBNI students are able to undertake research using sophisticated state-of-the art instruments, and unique facilities such as neutron beams at reactor, synchrotron radiation facility, high temperature loops, high performance computers, etc. Research collaborations between faculty members across CIs/OCC is a common enriching feature. Such collaborations enhance the quality of research, and also make it possible to work on unique and challenging research problems by synergising the basic research strengths of some of the CIs/OCC with the technology development efforts at other CIs. The ordinances and guidelines of HBNI enable Ph.D programs to be co-guided by faculty from science and engineering disciplines, or faculty with specialisation in different branches of science (eg. Maths and biology). The evaluation processes also ensure high standards in the research work as well as publications, adherence to high ethical standards and promotion of the spirit of inquiry among employee students.

The research promotion policy of HBNI articulates the above aspects, which are in line with its vision, mission and core values. The policy document was approved by the Council of Management, the Apex body of HBNI chaired by Secretary, DAE, and is displayed on the HBNI website.

File Description	Document
Minutes of the Governing Council/ Syndicate/Board of Management related to research promotion policy adoption	View Document
URL of Policy document on promotion of research uploaded on website	View Document

3.1.2 The institution provides seed money to its teachers for research (average per year, INR in Lakhs)

Response: 0

3.1.2.1 **The amount of seed money provided by institution to its faculty year-wise during the last five years (INR in lakhs).**

2018-19	2017-18	2016-17	2015-16	2014-15
0	0	0	0	0

File Description	Document
Minutes of the relevant bodies of the University	View Document
Institutional data in prescribed format	View Document
Budget and expenditure statements signed by the Finance Officer indicating seed money provided and utilized	View Document

3.1.3 Percentage of teachers receiving national / international fellowship / financial support by various agencies for advanced studies / research during the last five years.

Response: 2.12

3.1.3.1 **The number of teachers who received national / international fellowship / financial support by various agencies for advanced studies / research year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
26	22	20	31	11

File Description	Document
Institutional data in prescribed format	View Document
e-copies of the award letters of the teachers	View Document

3.1.4 Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other research fellows enrolled in the institution during the last five years.

Response: 1810

3.1.4.1 **The Number of JRFs, SRFs, Post Doctoral Fellows, Research Associates and other research fellows enrolled in the institution year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
393	336	357	399	325

File Description	Document
Institutional data in prescribed format	View Document
Any additional information	View Document

3.1.5 Institution has the following facilities to support research

1. **Central Instrumentation Centre**
2. **Animal House/Green House**
3. **Museum**
4. **Media laboratory/Studios**
5. **Business Lab**
6. **Research/Statistical Databases**
7. **Mootcourt**
8. **Theatre**
9. **Art Gallery**

Response: A. 4 or more of the above

File Description	Document
Upload the list of facilities provided by the university and their year of establishment	View Document
Upload any additional information	View Document
Paste link of videos and geotagged photographs	View Document

3.1.6 Percentage of departments with UGC-SAP, CAS, DST-FIST, DBT, ICSSR and other recognitions by national and international agencies (Data for the latest completed academic year)

Response: 100

3.1.6.1 **The Number of departments with UGC-SAP, CAS, DST-FIST , DBT, ICSSR and other similar recognitions by national and international agencies.**

Response: 7

File Description	Document
Institutional data in prescribed format	View Document
e-version of departmental recognition award letters	View Document
Any additional information	View Document

3.2 Resource Mobilization for Research

3.2.1 Extramural funding for Research (Grants sponsored by the non-government sources such as industry, corporate houses, international bodies for research projects) endowments, Chairs in the University during the last five years (INR in Lakhs).

Response: 2699.9

3.2.1.1 **Total Grants for research projects sponsored by the non-government sources such as industry, corporate houses, international bodies, endowments, Chairs in the institution year-wise during the last five years (INR in Lakhs).**

2018-19	2017-18	2016-17	2015-16	2014-15
855.4	696.1	553.1	512.4	82.9

File Description	Document
Institutional data in prescribed format	View Document
e-copies of the grant award letters for research projects sponsored by non-government	View Document

3.2.2 Grants for research projects sponsored by the government agencies during the last five years (INR in Lakhs).

Response: 165961

3.2.2.1 **Total Grants for research projects sponsored by the government agencies year-wise during**

the last five years (INR in Lakhs).

2018-19	2017-18	2016-17	2015-16	2014-15
45941.4	41117.6	28200.8	26168.7	24532.5

File Description	Document
Institutional data in prescribed format	View Document
e-copies of the grant award letters for research projects sponsored by government	View Document

3.2.3 Number of research projects per teacher funded by government and non-government agencies during the last five years

Response: 2.35

3.2.3.1 **Number of research projects funded by government and non-government agencies during the last five years.**

Response: 592

3.2.3.2 **Number of full time teachers worked in the institution year-wise during the last five years..**

Response: 1261

File Description	Document
Supporting document from Funding Agency	View Document
Institutional data in prescribed format	View Document
Any additional information	View Document
Paste Link for the funding agency website	View Document

3.3 Innovation Ecosystem

3.3.1 Institution has created an eco system for innovations including Incubation centre and other initiatives for creation and transfer of knowledge.

Response:

HBNI has under its academic umbrella eleven institutions of DAE as its constituent institutions (CIs)/off-campus centre (OCC). Out of these, seven are grant-in-aid institutes of DAE, most of which are engaged in fundamental research (eg. HRI, IMSc, IoP, SINP) or education programmes at MSc level (NISER, HRI) or medical research (TMC). Due to the mandates of these institutions, activities in these institutions are not

oriented to technology development. In the DAE units under HBNI (BARC, IGCAR, VECC and RRCAT), although there is no emphasis on technology incubation, other initiatives for creation, transfer and exploitation of knowledge are pursued vigorously. One of the mandates of HBNI is to develop knowledge base and technology solutions for indigenous development of nuclear science and technology, and thus the results of research work of HBNI students in DAE units is often directly relevant to DAE's own programs. Such developments get converted into technologies and products / processes in the industrial units (eg. Nuclear Fuel Complex, Heavy Water Board), commercial unit (Board of Radiation and Isotope technology) and public sector companies (eg. NPCIL, ECIL) under DAE, which thus play the role of incubation as well as implementation centres. A part of the research programs of DAE units under the HBNI umbrella do deal with problems of wider interest, and the DAE has indeed created an ecosystem for incubating the innovation developed by the academic & research staff in such domains, with the help of the industry. An IPR cell at DAE provides guidance and assistance to the CIs/OCC in filing patents.

BARC, a CI of HBNI, has a Technology Transfer and Collaboration Division (TTCD) to assist in the transfer of the technologies developed in BARC as well as other DAE units for commercial exploitation. This division is presently headed by a senior professor of HBNI. In addition, some of the CIs, like BARC, IGCAR, RRCAT, VECC and IPR, have a technology transfer cell/committee which coordinates with TTCD and arranges the logistics for transferring technology developed in the Centre to the industry.

The technologies developed in BARC as well as other DAE for public utilization are available for transfer on non-exclusive basis, on the TTCD website (http://www.barc.gov.in/technologies/technology.html) under various areas: Agriculture and Bioscience, Radiation Technology, Advanced Instrumentation, Medical Equipments, Engineering, Environment, Chemical and Water Technologies. In fact, BARC has entered into MoUs with several Agricultural Universities for incubation of technologies for new varieties of seeds. The list of technologies transferred in the last five years is in the supporting document. A technology developed by BARC, "A plant lectin based formulation for prophylactic protection against oxidative stress-induced toxicity, morbidity and mortality" is presently available for incubation to the industry (see https://technologies.britatom.gov.in/).

IPR has set up Facilitation Centre for Industrial Plasma Technologies (FCIPT) to promote the commercial exploitation of plasma technologies through development, incubation, demonstration, manufacturing and transfer. FCIPT has generated several advanced and non-conventional plasma based technologies for material processing and environmental remediation.

File Description	Document
Paste link for additional information	View Document

3.3.2 Number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR),entrepreneurship, skill development during the last five years.

Response: 23

3.3.2.1 **Total number of workshops/seminars conducted on Research methodology, Intellectual Property Rights (IPR),entrepreneurship, skill development year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
6	3	5	0	9

File Description	Document
Report of the event	View Document
Institutional data in prescribed format	View Document

3.3.3 Number of awards / recognitions received for research/innovations by the institution / teachers / research scholars / students during the last five years.

Response: 330

3.3.3.1 **Total number of awards / recognitions received for *research* / innovations won by institution / teachers / research scholars / students year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
55	78	81	67	49

File Description	Document
Institutional data in prescribed format	View Document
e- copies of award letters	View Document

3.4 Research Publications and Awards

3.4.1 The Institution ensures implementation of its stated Code of Ethics for research through the following: 1. Inclusion of research ethics in the research methodology course work 2. Presence of Ethics committee 3. Plagiarism check through software 4. Research Advisory Committee

Response: A. All of the above

File Description	Document
Code of ethics for Research document, Research Advisory committee and ethics committee constitution and list of members on these committees, software used for Plagiarism check, link to Website	View Document

3.4.2 The institution provides incentives to teachers who receive state, national and international recognitions/awards 1.Commendation and monetary incentive at a University function 2.Commendation and medal at a University function 3. Certificate of honor 4.Announcement in the Newsletter / website

Response: D. 1 of the above

File Description	Document
Institutional data in prescribed format	View Document
e- copies of the letters of awards	View Document
Any additional information	View Document

3.4.3 Number of Patents published / awarded during the last five years.

Response: 33

3.4.3.1 **Total number of Patents published / awarded year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
9	4	8	5	7

File Description	Document
Institutional data in prescribed format	View Document
Any additional information	View Document

3.4.4 Number of Ph.D's awarded per teacher during the last five years.

Response: 0.82

3.4.4.1 **How many Ph.D's are awarded within last five years.**

Response: 1039

3.4.4.2 **Number of teachers recognized as guides during the last five years**

Response: 1261

File Description	Document
Institutional data in prescribed format	View Document
URL to the research page on HEI web site	View Document

3.4.5 Number of research papers per teachers in the Journals notified on UGC website during the last five years

Response: 11.93

3.4.5.1 **Number of research papers in the Journals notified on UGC website during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
2486	2606	2512	2372	2406

File Description	Document
Institutional data in prescribed format	View Document

3.4.6 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years

Response: 1.22

3.4.6.1 **Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year-wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
225	180	261	251	351

File Description	Document
Institutional data in prescribed format	View Document

3.4.7 E-content is developed by teachers :

1. **For e-PG-Pathshala**
2. **For CEC (Under Graduate)**
3. **For SWAYAM**
4. **For other MOOCs platform**
5. **For NPTEL/NMEICT/any other Government Initiatives**
6. **For Institutional LMS**

Response: C. Any 3 of the above

File Description	Document
Institutional data in prescribed format	View Document
Give links or upload document of e-content developed	View Document

3.4.8 Bibliometrics of the publications during the last five years based on average citation index in Scopus/ Web of Science or PubMed

Response: 8.73

File Description	Document
Bibliometrics of the publications during the last five years	View Document

3.4.9 Bibliometrics of the publications during the last five years based on Scopus/ Web of Science - h-index of the Institution

Response: 109.5

File Description	Document
Bibiliometrics of publications based on Scopus/ Web of Science - h-index of the Institution	View Document

3.5 Consultancy

3.5.1 Institution has a policy on consultancy including revenue sharing between the institution and the individual and encourages its faculty to undertake consultancy.

Response:

DAE strongly encourages sharing of knowledge base and expertise through consultancy. The CIs and OCC of HBNI have a large pool of talent with great expertise in several unique domains, that are of high value to other national missions such as space and defence, industries and society at large. The faculty in DAE Units (BARC, IGCAR, VECC and RRCAT) in fact, offer consultancy to several national programs, and particularly for space and defence. BARC also offers consultancy to farmers and other private entities to set up food irradiators, NISARGRUNA plants, production of high yielding / salt tolerant crop varieties, etc (for details refer to https://technologies.britatom.gov.in/licensees/agriculture-bioscience). ***However, the Government rules do not permit DAE scientists to engage in consultancy on individual basis, and therefore sharing of revenue does not arise.***

The Grant-in-aid institutions of HBNI do engage in consultancy, and where applicable, they also permit faculty to receive a share of the revenue (eg.NISER). The R & D Manual of NISER, available at the link below, explicitly indicates the policy of consultancy, including sharing of revenue with faculty.

https://www.niser.ac.in/docs/rnd-manual.pdf

As per this policy, a consultation fee / honorarium can be paid to the faculty members and supporting staff of the institute engaged in the project, up to a maximum of 40 % of the cost of the project. The fee would depend on several factors such as importance of the advice and experience of the faculty. However, with the emphasis on meeting the mandates of the institutions, there have been no instances of individuals providing consultancy.

File Description	Document
Upload soft copy of the Consultancy Policy	View Document
Upload minutes of the Governing Council/ Syndicate/Board of Management related to consultancy policy	View Document
Paste URL of the consultancy policy document	View Document

3.5.2 Revenue generated from consultancy and corporate training during the last five years (INR in Lakhs).

Response: 2788.19

3.5.2.1 **Total amount generated from consultancy and corporate training year-wise during the last five years (INR in lakhs).**

2018-19	2017-18	2016-17	2015-16	2014-15
507.46	466.48	593.51	613.915	606.82

File Description	Document
Institutional data in prescribed format	View Document
Audited statements of accounts indicating the revenue generated through consultancy	View Document
Any additional information	View Document

3.6 Extension Activities

3.6.1 Extension activities in the neighbourhood community in terms of impact and sensitising students to social issues and holistic development during the last five years.

Response:

CIs/OCC of HBNI have a long tradition of interacting with the community in the neighbourhood. The faculty of HBNI take pride in extending their knowledge base to train and educate the community, through a large number of professional bodies that are functional in these organisations. Faculty also participate as resource persons in the extension/out-reach programs organized by DAE across the country.

Several faculty of HBNI from BARC take active part in training of students for the International Science Olympiads each year. Several faculty from CIs/OCC also take courses in other educational / research institutions (eg. HBNI-BARC faculty providing support to Centre for Excellence in Basic Sciences (affiliated to Mumbai University)). A school on analytical chemistry is organized regularly by BARC for the benefit of students and young researchers from all over the country.

HRI runs the Harsha School club in the Chhatnag village area, which works to reduce the drop-outs from schools by making the school children realize that learning can be interesting. The school has been greatly supported by HRI and several individuals through their generous financial support over the years. HRI also organises a week long science programme in Hindi for higher secondary students from Allahabad district, to motivates them to take up a career in Science.

The research scholars as well as faculty of IGCAR participate in the Swachh Bharat activities. Faculty and students also participate in demonstration / lecture programs at various schools and colleges under the aegis of several professional organisations such as IANCAS, ISRP, SACSE, IWSA.

RRCAT also encourages holistic development of students through participation in outreach activities. During Science Day celebration in the Centre students are deputed as volunteers for various exhibits and also serve as demonstrator to explain the models to the visiting children from various schools and other visitors from adjoining areas. To sensitise the students about various social issues every year marathon run is organized with a focus on some vexing issues, eg. Use of plastic, water scarcity.

SINP organises regular science outreach programs for schools of rural West Bengal, Kendriya Vidyalaya schools and colleges. Along with HBCSE, Mumbai, SINP carries out various activities of Vigyan Pratibha project regularly with 17 K.V. schools in West Bengal. SINP also participates in science outreach fairs in various parts of WB organized by NGOs. On Science day, Research Fellows of SINP organize a science quiz contest which attracts enthusiastic participation from the school students.

IoP students have been teaching children from a nearby Basti, language, basic mathematics and science in Odia, Hindi & English for many years. IoP also organizes many activities for students from various districts of Odisha, on the occasion of National Science Day. Faculty, students and staff of IoP also organize demonstration/lecture programs at various schools and colleges. Telescope shows are organized for general public, on the occasion of events of astronomical importance (eg. Eclipses). Swachh Bharat related activities are also organized by IoP at different places in Odisha.

3.6.2 Number of awards received by the Institution, its teachers and students from Government /Government recognised bodies in recognition of the extension activities carried out during the last five years

Response: 0

3.6.2.1 **Total number of awards and recognition received for extension activities from Government/**

Government recognised bodies year-wise during the last five years.

2018-19	2017-18	2016-17	2015-16	2014-15
0	0	0	0	0

File Description	Document
Institutional data in prescribed format	View Document

3.6.3 Number of extension and outreach programs conducted by the institution including those through NSS/NCC/Red cross/YRC during the last five years (including Government initiated programs such as Swachh Bharat, Aids Awareness, Gender Issue, etc. and those organised in collaboration with industry, community and NGOs).

Response: 278

3.6.3.1 **Number of extension and outreach programs conducted by the institution through NSS/NCC/Red cross/YRC etc. (including Government initiated programs such as Swachh Bharat, Aids Awareness, Gender Issue, etc. and those organised in collaboration with industry, community and NGOs) year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
37	30	52	61	98

File Description	Document
Reports of the event organized	View Document
Institutional data in prescribed format	View Document

3.6.4 Average percentage of students participating in extension activities listed at 3.6.3 above during the last five years

Response: 23.82

3.6.4.1 **Total number of students participating in extension activities listed at 3.6.3 above year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
564	352	505	766	1445

File Description	Document
Report of the event	View Document
Institutional data in prescribed format	View Document

3.7 Collaboration

3.7.1 Number of Collaborative activities for research, Faculty exchange, Student exchange/ internship per year

Response: 137

3.7.1.1 **Total number of Collaborative activities with other institutions / research establishment / industry for research and academic development of faculty and students year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
176	149	159	121	80

File Description	Document
Institutional data in prescribed format	View Document
Copies of collaboration	View Document

3.7.2 Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

Response: 431

3.7.2.1 **Number of functional MoUs with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research year-wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
143	98	85	93	12

File Description	Document
Institutional data in prescribed format	View Document
e-copies of the MoUs with institution/ industry	View Document

Criterion 4 - Infrastructure and Learning Resources

4.1 Physical Facilities

4.1.1 The institution has adequate facilities for teaching - learning. viz., classrooms, laboratories, computing equipment, etc.

Response:

All the eleven CIs/OCC of HBNI have adequate state-of-art teaching-learning facilities. For brevity, examples of facilities available in some institutions are described below. Similar facilities are also available in other institutions for advanced teaching-learning.

The BARC Training School, Mumbai has sprawling building with 14 classrooms and six lecture halls. All classrooms and lecture halls are equipped with LCD facilities as well as internet connection over the BARC LAN. There are two computer laboratories exclusively for students. There is a Process Control Laboratory and a Nuclear Physics Laboratory in the building. Additionally, students have access to more than 150 laboratories in BARC to carry out laboratory work at the cutting edge of science & technology.

Similarly, the BARC Training school at IGCAR operates in a dedicated complex with classrooms provided with thin Client, Projector and LAN facility.

In HRI, there are ten classrooms and discussion rooms for the lectures. Classrooms have projector based teaching facility and are equipped with ICT facilities. There are state-of-art laboratories and a high performance Cluster Computation Facility for scientific computing. The hostels too have Wi-Fi connectivity.

IMSc has adequate class rooms, office rooms and seminar halls for faculty and students. The Office rooms and Class rooms are equipped with fast internet access and have LCD Data projector, Motorized white screen, Black/Green board, LAN &WiFi. A Media center is used for e-learning through video contents. A multi-functional studio is available for video conferencing, web streaming, video recordings, meetings, etc. Remote classroom activities are executed by faculty for other elite institutes.

IOP has four Wi-Fi and internet based classrooms for students. It has two seminar halls equipped with LCD Projectors, white boards and internet connectivity to conduct conferences, seminars and workshops for students and faculty. It also has a computer facility dedicated for scientific computation and IT services.

RRCAT has 4 classrooms for regular teaching, some of them equipped with ICT facilities. The laboratory work is carried out in the 40 departmental laboratories equipped with pertinent equipment and trained manpower. All PhD Scholars and PG students are provided with personal computers and network based centralized high performance computing facilities for research work.

In SINP, there are five classrooms equipped with LCD projector and Wi-Fi facilities. In addition, SINP has a computer lab with more than 30 desktops with internet and computing facilities for the first year PhD students undergoing course work. There are two lecture halls for seminars and colloquiums; and one large auditorium with audio-visual system for special lectures and events, cultural and outreach programmes.

TMC has adequate facilities of classrooms, teaching aids and access to all relevant journals and books in

the library. Students receive training both through didactic lectures and are encouraged to present work in seminars, CMEs and workshops. For practical training, they get adequate exposure to the day-to-day management of patients in the clinic, wards and OTs.

File Description	Document
Upload any additional information	View Document
Paste link for additional information	View Document

4.1.2 The institution has adequate facilities for cultural activities, yoga, games (indoor, outdoor) and sports. (gymnasium, yoga centre, auditorium, etc.)

Response:

All the CIs/OCC have excellent facilities for sports, yoga and cultural activities. For the sake of brevity, facilities available in some of the institutions are described below.

A majority of the students and the faculty of BARC stay in Anushakti Nagar. The colony has many Badminton courts, Tennis courts, Basket Ball court, Cricket grounds, Football grounds, and multi-purpose halls for indoor games and yoga. There are two community halls for cultural activities. In addition, DAE Convention Centre is used to organize seminars/conferences beside conducting many cultural activities. All these facilities are open for use by students

HRI encourages sports by providing excellent facilities to the students, faculty, non-teaching staff and postdocs. It has facilities for many indoor/ outdoor sports facilities, viz. badminton court, table tennis facility, swimming pool, football ground, cricket ground, gymnasium, track and field (400 metres), volleyball court, etc. There is a well-equipped community centre for recreational purpose. There is a lounge area in guesthouse where yoga classes are held regularly. Many outdoor games are also organized in football ground.

At IGCAR, the research scholars stay in an Enclave with exclusive facilities of mess, sports, indoor and outdoor games and cultural activities. There are sports facilities exclusively for the research Scholars and also common facilities which can be used by other Students. Some of the facilities are shuttle court, swimming pool, cricket and hockey grounds, tennis court, table tennis, chess, carom, etc. Students participate in various sports competitions within institution and also at inter unit levels.

Institute of Physics has an auditorium of 330 capacity where Colloquia, Seminars, Workshops, Conferences, Cultural activities, Social programs are organized regularly. The Institute campus has housing facilities for the students. Both indoor and outdoor games and sports facilities along with mini-gym are also available in the campus. The Institute also has a guest house, auditorium, and dispensary in the campus.

SINP has indoor game facilities for table tennis, carrom, chess, gymnasium etc. and also facilities for badminton and volleyball. The institute has a joint cultural committee (JCC) with representatives from academic and support staff and research fellows, which organizes annual sports, cricket and football

tournaments in the nearby sports facilities. JCC also organizes cultural programmes in SINP auditorium with participation from students and employees.

The student hostel of the Institute of Plasma Research has sports room for indoor games. The Gymnasium room has manual treadmill, flat bench, inclined bench, multifunctional machine, dumbbells, rotable stand, etc. The outdoor games such as shuttle badminton, volleyball are played by the students. Sports event competitions are also conducted in the institute.

TMC has adequate facilities for sports, games (indoor, outdoor), gymnasium, yoga centre and cultural activities. Students participate in sports and cultural activities organized by Recreation Club, such as badminton, table tennis, athletics, cricket, etc. Students are also members of TMH cricket team. Annual events are held during Diwali, Hospital Foundation Day and Hindi Rashtrabhasha Divas.

File Description	Document
Upload any additional information	View Document
Geotagged pictures	View Document
Paste link for additional information	View Document

4.1.3 Availability of general campus facilities and overall ambience

Response:

The CIs/OCC of HBNI are world class institutions with excellent campus facilities and related infrastructure. Many of them are situated in idyllic locations with natural bounty, and great emphasis is placed on maintenance of the campus facilities with highest standards. The Central Office of HBNI is situated in Anushakti Nagar which is one of the residential townships of DAE.

The CIs and OCC, especially the DAE units, have sprawling complexes with lush green landscape interspersed with clean wide internal roads having adequate lighting. The campuses of DAE units are guarded 24 x 7. The overall ambience of BARC is awe-inspiring, with buildings of unique world class architecture (eg. the Modular Laboratories building which is one of the longest buildings of such kind). There are 1430 species of plants in BARC campus, which reflects the excellent floral and plants diversity. The campuses of the CIs/OCC also have auditoria of different capacities, post-office, bank, dispensary, several canteens, a co-op. society, etc.

DAE has townships at its major sites and these offer residential facilities for employees, hostels for students, guest houses for visitors, sports and medical facilities for all residents including students, schools for children of employees, recreation centres and shopping centres. Construction and maintenance of these townships follow the policies of the Government including disabled-friendly measures. All hostels have mess, clean toilets and housekeeping facilities; high degree of security with CCTV coverage of some sites (eg. BARC hostel). A variety of sports and cultural events are organised in the townships throughout the year in which students and faculty participate actively. Some campuses nurture birds and animals, eg. peacocks in IPR and RRCAT campuses. Tree planting and growing of flowers are given special emphasis on all campuses, resulting in beautiful ambience. Tree cover attracts birds, eg. greenery of IoP attracts

hundreds of migratory birds on their way to the Chilka lake of Odisha, during every winter.

More than 30% of HBNI students pursue their academic programs in BARC. Majority of them stay at Anushaktinagar, a beautiful township, fully self-contained with entertainment, recreation and shopping facilities, swimming pool and other sports facilities. The students are provided with internet and library facilities at HBNI building. A large Convention centre has been established in Anushaktinagar, with multiple halls, to organise conferences and other meetings. HBNI students at BARC are provided accommodation on sharing basis in Anushaktinagar. A new, one-thousand room Hostel for students is now in an advanced stage of completion. For healthcare needs of the students as well as faculty, there are many dispensaries providing for several diagnostic procedures and preventive and curative treatments under the Contributory Health Service Scheme (CHSS) of DAE. There is also a multispecialty hospital (BARC hospital) for specialist and intensive care treatment.

The salubrious and secure facilities and environment in BARC and other CIs/OCC and their townships is very conducive for students and faculty to make their best contributions in their respective domains.

File Description	Document
Paste link for additional information	View Document

4.1.4 Average percentage of expenditure for infrastructure augmentation excluding salary during the last five years (INR in Lakhs)

Response: 29.55

4.1.4.1 **Expenditure for infrastructure augmentation, excluding salary during the last five years (INR in lakhs)**

2018-19	2017-18	2016-17	2015-16	2014-15
27074	21119	15173	10379	12991

File Description	Document
Upload audited utilization statements	View Document
Institutional data in prescribed format	View Document

4.2 Library as a Learning Resource

4.2.1 Library is automated using Integrated Library Management System (ILMS) and has digitisation facility

Response:

The CIs and OCC of HBNI all have large libraries with extensive collection of books, reports and other documents to serve the faculty as well as students. All these libraries are fully automated using Integrated Library Management System. While some of the CIs are using Libsys, several of the CIs have migrated to KOHA Library Management System. The following provides the description of ILMS at BARC. The management of library and its resources at other CIs/OCC are similar, except for scale.

BARC Central Library is one of the most comprehensive and biggest of its kind in Asia with a collection of more than 7,00,000 documents including 1,10,000 books and 1,50,000 bound volumes on fields related to nuclear science and technology. Automation is essential to manage such a large collection.

Automation of the library services in BARC started in 1999 with barcode based check-in and check-out of documents and computer-based library management and upgradation of ILMS with all modules like Acquisition, Cataloguing, Circulation, Serials, OPAC (Online Public Access Catalogue), etc. In 2012, an ISO15693 / 18000-3 compliance based 13.56 MHz RFID System was implemented and integrated with the then existing ILMS. Currently this system is being extensively used by the readers with Self-Kiosk RFID system. RFID technology using Hand-held Stock/ Inventory System, Staff stations for RFID tagging, etc., have improved the efficiency of the Library services.

OPAC is an important module of ILMS in readers being able to know the availability of books and the status of its issue through the campus-wide network SARASWATI (http://saraswati.barc.gov.in), which also enables access to a large number of documents such as standards and reports on the Users' desktops. A large number of users access OPAC for renewal and reservation of books while more than 70% transactions happen on Self-Kiosk RFID system.

BARC Library makes available to its members various subscribed online resources such as Journals, Standards, Databases and eBooks through the online Information Gateway LAKSHYA (http://lakshya.barc.gov.in). While LAKSHYA is available only within the BARC Trombay, the readers are now able to access the resources on LAKSHYA from anywhere through a cloud facility HOoA (Home Office or Anywhere).

Digitisation of various types of content is an inseparable part of automation. BARC library has been digitising various documents, such as reports, BARC Newsletters, BARC reports, PhD theses from BARC scientists, which originated in the institute and not protected by copyright. A large numbers of reports in the form of micro- fiche films and micro-cards sourced from various international nuclear science laboratories have been digitized.

Recently, digitization of photographs and negatives (scanning, tagging and indexing) was initiated for the purpose of archiving them. Major collection of 35mm slides and negatives are being scanned using Medium Format Film Scanner with features like 3-line CCD sensor with a 3200 dpi resolution and 48-bit color depth. BARC Library has also been archiving various news items on nuclear science related news items appearing in the print media since 2000.

File Description	Document
Upload any additional information	View Document
Paste link for additional information	View Document

4.2.2 Institution has access to the following: 1. e-journals 2. e-ShodhSindhu 3. Shodhganga Membership 4. e-books 5. Databases 6. Remote access to e-resources

Response: A. Any 4 or more of the above

File Description	Document
Upload any additional information	View Document
Institutional data in prescribed format	View Document

4.2.3 Average annual expenditure for purchase of books/ e-books and subscription to journals/e-journals during the last five years (INR in Lakhs)

Response: 3521.4

4.2.3.1 Annual expenditure for the purchase of books and journals including e-journals year-wise during last five years (INR in Lakhs)

2018-19	2017-18	2016-17	2015-16	2014-15
4460	4062	3384	3046	2655

File Description	Document
Institutional data in prescribed format	View Document
Audited statements of accounts	View Document
Any additional information	View Document

4.2.4 Percentage per day usage of library by teachers and students (foot falls and login data for online access) during the last completed academic year

Response: 99.13

4.2.4.1 **Number of teachers and students using library per day over last one year**

Response: 4212

File Description	Document
Details of library usage by teachers and students (Library accession register, online accession details to be provided as supporting documents)	View Document
Any additional information	View Document

4.3 IT Infrastructure

4.3.1 Percentage of classrooms and seminar halls with ICT - enabled facilities such as LCD, smart board, Wi-Fi/LAN, audio video recording facilities. (Data for the latest completed academic year)

Response: 100

4.3.1.1 **Number of classrooms and seminar halls with ICT facilities**

Response: 182

File Description	Document
Institutional data in prescribed format	View Document
Paste link for additional information	View Document

4.3.2 Institution has an IT policy, makes appropriate budgetary provision and updates its IT facilities including Wi-Fi facility

Response:

The CIs/ OCC of HBNI are all research institutions of high eminence, pursuing a large variety of research programs in different disciplines. Some of them have very large number of staff, which makes it very important to have a campus wide network of IT facilities to enable academic as well as administrative processes. All CIs of HBNI also pursue computational and modelling activities as part of their research, for which the IT infrastructure is essential. Due to security reasons, the network in some of the institutions are restricted with regard to access. However, in many of the CIs, Wi-Fi facility is available across the campus. All CIs/OCC of HBNI have set up and periodically upgraded their IT facilities through funding made available by DAE.

All the desktops of the faculty, students, post-doctoral fellows and visiting fellows are periodically upgraded with the newer version of Operating Systems. Newer versions of several applications software and packages are time–to-time upgraded on users' systems, computer centre and conference room systems, enabling the researchers to do their numerical and analytical calculations faster and obtain more precise results.

Since many CIs of HBNI are strategic facilities, protection of the network and websites through elaborate security systems is an important requirement. Since data security is a prime concern in the DAE organizations, the access to these facilities is governed by a comprehensive Internet and Network Security Policy. The antivirus programs are frequently updated. Firewall rules are time-to-time modified to increase the security level of the servers. All the servers facing direct Internet are well protected. Users' machines are also well protected and are behind the firewall. While most of the academic software are open source, a few commercial software for academic use are also loaded on servers and standalone machines for use in computations by the faculty and students.

All the administrative staff including the project and contractual staff have also been provided a desktop

each with the required software so that they can do their work efficiently and timely.

For use in computation-intensive research and development programs, high performance computation facilities have been established by several CIs. For example, at BARC, the Anupam series of in-house developed supercomputers offer high computational capability. Similar high performance computation clusters are available at IGCAR, RRCAT, HRI, IoP etc. Such systems are periodically updated to enhance the computation capability as required by the research programs. For example, the HPCC at BARC was upgraded from 270 teraflops (Aganya) to 1.35 petaflops (Atulya) in 2019 ; at IGCAR the facility was upgraded to 225 teraflops in 2015, from 30 teraflops available earlier. RRCAT upgraded its HPC facility by commissioning Kshitij-5, having computational power of 190 teraflops.

HBNI is committed to exploit the advantages of digital initiatives and use its IT infrastructure to deliver quality course content to students, to serve as a medium to interact with students and faculty, and to facilitate secure and easy updation of data.

File Description	Document
Upload any additional information	View Document
Paste link for additional information	View Document

4.3.3 Student - Computer ratio (Data for the latest completed academic year)

Response: 1:1

File Description	Document
Student – computer ratio	View Document

4.3.4 Available bandwidth of internet connection in the Institution (Leased line)

Response: A. ?1 GBPS

File Description	Document
Details of available bandwidth of internet connection in the Institution	View Document

Other Upload Files	
1	View Document

4.3.5 Institution has the following Facilities for e-content development

1. **Media centre**
2. **Audio visual centre**
3. **Lecture Capturing System(LCS)**

4. Mixing equipments and softwares for editing

Response: A. All of the above

File Description	Document
Institutional data in prescribed format	View Document
Links of photographs	View Document

4.4 Maintenance of Campus Infrastructure

4.4.1 Average percentage expenditure incurred on maintenance of physical facilities and academic support facilities excluding salary component during the last five years

Response: 48.74

4.4.1.1 **Expenditure incurred on maintenance of infrastructure (physical facilities and academic support facilities) excluding salary component year-wise during the last five years (INR in lakhs)**

2018-19	2017-18	2016-17	2015-16	2014-15
32054	28497	28003	25623	22300

File Description	Document
Institutional data in prescribed format	View Document
Audited statements of accounts	View Document

4.4.2 There are established systems and procedures for maintaining and utilizing physical, academic and support facilities - laboratory, library, sports complex, computers, classrooms etc.

Response:

The CIs/OCC of HBNI have world class academic and physical infrastructure in terms of laboratory facilities, library, computing systems, etc., and also other supporting facilities such as hostels and sports complexes. High emphasis is placed on maintenance of these facilities and periodic upgradation so that the productivity of the organisations is sustained and improved. Every CI/OCC has set up dedicated administrative structures for this purpose. In larger CIs (eg. BARC, IGCAR), a separate Division looks after the library or computation facilities. Maintenance of computers and attending to the breakdown / repair issues is done by contract. The Scientific & Information Resource Divisions in CIs, eg. BARC, IGCAR and RRCAT look after the library facilities, including periodic refurbishment, renewal of contracts and utilization of the library. The larger CIs/OCC also have a Human Resource Development Division which also looks after the classroom infrastructure, and technical services section / division to provide

maintenance support to the infrastructure. In smaller establishments under DAE, committees are formed that include academicians and administrative personnel (and often as an invitee, students representative) to take care of the maintenance and upgradation of the academic facilities (eg. HRI). The committees make recommendations for any upgradation that is put up for sanction of Director, subsequent to which the unit of administration takes steps to implement. Examples of such committees include Space Planning and Allocation Committee (IMSc) headed by the Director himself to decide policies and take overall decisions on Infrastructural, Office space availability for Faculty members, Research Scholars and others. The support infrastructure (eg. hostels, sports complexes including swimming pools, cricket grounds, courts for tennis and other games) are also maintained by separate committees. In larger DAE units such as BARC and IGCAR, a separate organization (DCSEM, GSO) under DAE looks after maintenance of the infrastructure and its periodic upgradation. To address maintenance issues, several of the CIs have online registration of complaints (eg. BARC, IGCAR, IPR).

For utilization of the sports facilities, most of the CIs/OCC have evolved on-line booking system. User Committees are set up to regulate the usage of the facilities. Similarly, use of library from one's own desktop is very common in the CIs/OCC, with a large number of e-resources available on-line. In fact, physical visit to library is usually required only for consulting / drawing / returning books and hard copy reports. Many libraries have been provided funds to digitize reports to make them available on desktops for effective utilization.

Laboratory equipment are maintained through service contracts with the suppliers. Periodic upgradation of the lab facilities including scientific instruments, crucial for carrying out R &D in frontline areas, is carried out through capital projects funded by DAE. Thus, the expenditure for maintenance as well as upgradation of the academic and physical infrastructure are met by DAE and therefore, the CIs and OCC of HBNI have state-of the art systems functional in their units for the utilization by faculty as well as students.

File Description	Document
Paste link for additional information	View Document

Criterion 5 - Student Support and Progression

5.1 Student Support

5.1.1 Average percentage of students benefited by scholarships and freeships provided by the institution, Government and non-government agencies (NGOs) during the last five years (other than the students receiving scholarships under the government schemes for reserved categories).

Response: 96.79

5.1.1.1 **Number of students benefited by scholarships and freeships provided by the institution, Government and non-government agencies (NGOs) year wise during the last five years (other than the students receiving scholarships under the government schemes for reserved categories).**

2018-19	2017-18	2016-17	2015-16	2014-15
3082	3154	3121	2982	2769

File Description	Document
Upload self attested letter with the list of students sanctioned scholarship	View Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.1.2 Average percentage of students benefited by career counseling and guidance for competitive examinations offered by the Institution during the last five years.

Response: 3.02

5.1.2.1 **Number of students benefitted by guidance for competitive examinations and career counselling offered by the institution year wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
74	65	125	143	65

File Description	Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.1.3 Following Capacity development and skills enhancement activities are organised for improving students capability 1. Soft skills 2. Language and communication skills 3. Life skills (Yoga, physical fitness, health and hygiene) 4. Awareness of trends in technology

Response: A. All of the above

File Description	Document
Institutional data in prescribed format	View Document
Link to Institutional website	View Document

5.1.4 The institution adopts the following for redressal of student grievances including sexual harassment and ragging cases 1. Implementation of guidelines of statutory/regulatory bodies 2. Organisation wide awareness and undertakings on policies with zero tolerance 3. Mechanisms for submission of online/offline students' grievances 4. Timely redressal of the grievances through appropriate committees

Response: A. All of the above

File Description	Document
Minutes of the meetings of student redressal committee, prevention of sexual harassment committee and Anti Ragging committee	View Document
Details of student grievances including sexual harassment and ragging cases	View Document
Link for additional information	View Document

5.2 Student Progression

5.2.1 Average percentage of students qualifying in state/national/ international level examinations during the last five years (eg: IIT-JAM/CLAT/ NET/SLET/GATE/ GMAT/CAT/GRE/ TOEFL/ Civil Services/State government examinations, etc.)

Response: 100

5.2.1.1 **Number of students qualifying in state/ national/ international level examinations (eg: IIT/JAM/ NET/ SLET/ GATE/ GMAT/CAT/GRE/ TOEFL/ Civil Services/ State government examinations, *etc.)*) year-wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
79	78	88	84	80

5.2.1.2 **Number of students appearing in state/ national/ international level examinations (eg: IIT/JAM/ NET / SLET/ GATE/ GMAT/CAT,GRE/ TOEFL/ Civil Services/ State government examinations) year-wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
79	78	88	84	80

File Description	Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.2.2 Average percentage of placement of outgoing students during the last five years

Response: 54.94

5.2.2.1 **Number of outgoing students placed year - wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
477	295	311	319	241

File Description	Document
Upload any additional information	View Document
Self attested list of students placed	View Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.2.3 Percentage of student progression to higher education (previous graduating batch).

Response: 23.49

5.2.3.1 **Number of outgoing student progressing to higher education.**

Response: 159

File Description	Document
Upload supporting data for student/alumni	View Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.3 Student Participation and Activities

5.3.1 Number of awards / medals won by students for outstanding performance in sports / cultural activities at inter-university / state / national / international events (award for a team event should be counted as one) during the last five years.

Response: 28

5.3.1.1 **Number of awards/medals won by students for outstanding performance in sports / cultural activities at inter-university / state / national / international events (award for a team event should be counted as one) year - wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
4	9	5	4	6

File Description	Document
Institutional data in prescribed format	View Document
e-copies of award letters and certificates	View Document
Link for additional information	View Document

5.3.2 Presence of Student Council and its activities for institutional development and student welfare.

Response:

HBNI believes that participative decision making can be a significant factor in Institute's success. By motivating the students in active participation in decision making, the Institute runs more efficiently and is more effective at achieving its objectives and goals. Accordingly, as part of good practices followed by HBNI, students are involved in various decision making processes of the CIs and OCC of HBNI and find representation in various committees set up the CIs/OCC.

The unique aspect of HBNI is that students of HBNI are spread over ten different Constituent Institutions and one Off-campus Centre. Also, a significant fraction of HBNI students (approx. one third) are Ph.D students, who receive individual attention through the Doctoral Committees. Therefore, involvement of students in various activities varies from CI to CI depending upon the profile of the students and the academic programs run in the respective CI/OCC.

For example, at IGCAR, the Complaints Committee constituted by Director to look into issues of sexual harassment has two representatives from students. A dedicated committee with students' representatives has been set up to deal with matters related to students belonging to SC&ST. The anti-ragging committee also has representative from students as a member.

Similarly, at other CIs, Internal Complaints Committee (Gender Bias Redressal), the Advisory Committees for Guest house / hostel, Library Committee, Official Language Implementation Committee, Sports / Gym Committee, Canteen Menu Committee, Cultural Committee etc. have representation from students. In several CIs (eg.RRCAT), some of the facilities associated with students are managed exclusively by the students themselves, eg. the mess facility, library facility provided in the hostel, gymnasium, sports facilities, etc. are managed by the respective committees comprising of students.

In some of the CIs, student participation is also encouraged in the teaching activities. IMSc operates a Pilot Programme on "Teaching Assistantship" with active participation of the Post- Doctoral Fellows and Students of the Institute in Teaching activities in order to provide them opportunity to improve their Teaching skills. The students also participate in organizing special events along with their mentors. For example, the prestigious Annual Outreach Event of the Institute "Science at Sabha" featuring talks on science for the general public, in which over a thousand participants take part, sees the active participation of the students in the organizational aspects. Research scholars similarly participate in organising conferences in the CIs/OCC. In other CIs (eg.IGCAR, SINP), research scholars are also encouraged to exhibit their talents by bringing out Research Scholar's magazine. Research scholars are also encouraged to organise exclusive meet of Research Scholars on particular themes. For example, at IGCAR and ACTREC/TMC, research scholars take the complete responsibility for planning and organisation of scientific meeting of research scholars. Research scholars in SINP also organize annual programmes like blood donation camps and tree plantation. At NISER, student representatives are present in several bodies including Academic Council.

File Description	Document
Link for additional information	View Document

5.3.3 Average number of sports and cultural events / competitions organised by the institution per year

Response: 66.4

5.3.3.1 **Number of sports and cultural events / competitions organised by the institution year - wise during the last five years.**

2018-19	2017-18	2016-17	2015-16	2014-15
79	90	68	59	36

File Description	Document
Report of the event	View Document
Institutional data in prescribed format	View Document
Link for additional information	View Document

5.4 Alumni Engagement

5.4.1 The Alumni Association / Chapters (registered and functional) contributes significantly to the development of the institution through financial and other support services.

Response:

HBNI is a research university and a predominant fraction of its students are research scholars. Alumni of HBNI have occupied several key positions, particularly in academics. In the DAE units, a significant number of the students are employees. The contributions of alumni of HBNI, therefore needs to be seen from the perspective of nuclear energy development also. Several alumni are leading R&D programs in DAE units and mission oriented activities such as nuclear reactor design, development of fuel cycle, mining of nuclear materials, etc.. The alumni of HBNI have also provided leadership to professional bodies.

Many of the CIs/OCC of HBNI maintain an active alumni program, regularly interact with them through email networks, track their progress and invite them to programs organised in the institution so that the current students can be inspired by the interactions. The DAE units under HBNI being central government funded national laboratories, do not have any provision for accepting the financial and non-financial contribution from alumni towards the development of the institute. However, some of the CIs/OCC, which are Grant-in-aid institutes of DAE, do obtain financial support from the Alumni for various programs in the respective institutions.

SINP Alumni Association, formed in 2007, is a registered society which organizes seminars and lectures on popular and contemporary topics on a regular basis.

The alumni association of ACTREC/TMC is registered under the Society Registration Act 1860 as well as Mumbai Public Trust Act 1950. The alumni association, launched in 2006, regularly organises meetings of alumni.

TMC has an active Alumni association, though it is not a registered Society. The members usually gather for the Foundation Day celebrations around the last week of February/ 1st week of March, annually. This is the time when an Evidence-Based Management Conference on some aspects of Oncology/ Disease Site is held at the Tata Memorial Hospital. It is attended by several past students as well as by other oncologists across the country. In addition, there are certain meetings that are held every year by different departments in the Hospital which are also well attended by faculty. The Alumni, in addition to being registered participants, sometimes act as faculty in these meetings, depending on their expertise and the theme of the meeting. Additionally, when Alumni visit the Institute, they are invited to share their experiences and academic work through talks organised at the TMH. In addition, non-academic gatherings are also organised during such visits. The purpose is to hear and learn from their experiences, both curricular and

extra-curricular and also to create an opportunity for present students and residents to interact with the Alumni regarding opportunities available for career advancement and the way to apply for fellowships and similar opportunities abroad in Institutes of repute.

File Description	Document
Any additional information	View Document

5.4.2 Alumni contribution during the last five years (INR in Lakhs)

Response: E. <5 Lakhs

File Description	Document
Link for any additional information	View Document

Criterion 6 - Governance, Leadership and Management

6.1 Institutional Vision and Leadership

6.1.1 The institution has a clearly stated vision and mission which are reflected in its academic and administrative governance.

Response:

HBNI was established with the mission of contributing to the development of indigenous nuclear technological capability through the pursuit of excellence in academic programs in sciences (including engineering sciences) and mathematics.

The vision of HBNI is:

- To provide an academic framework for integrating basic research with technology development.
- To encourage inter-disciplinary research.
- To nurture an environment for attracting high quality manpower in the sciences including engineering sciences to take up a career in nuclear science and technology and related areas.

In line with the mission and vision, HBNI has pursued a path of excellence that has provided very valuable, large body of research work, and created human resources of high caliber, that have greatly aided in the development of nuclear science and technology in the country. This has been made possible by the unique Governance structure of HBNI.

To deal with the diversity of academic programs and R&D goals of the CIs and OCC, HBNI has set up a unique distributed academic governance mechanism, that has ensured that the institutions are able to meet their individual objectives and at the same time, adhere to a common set of academic standards and processes. The Academic Council of HBNI has as its members the Directors of all the CIs/OCC, as well as Conveners of the Boards of Studies. Every institute under HBNI has Deans to deal with the academic aspects of their programs. In addition, a Standing Committee of Deans, comprising of Deans (Academic) from all the institutions, ensured harmony in the processes. The Boards of Studies also have representatives from every CI and OCC, besides experts from other reputed institutes . The Doctoral Committee for every student has preferably, a member from another CI. These features have helped in integrating the basic research focus in the grant-in-aid institutions with the mission-oriented approach in the R & D units.

The administrative structure of HBNI is also unique. The CIs/OCC have their own administrative structure, and take care of matters relating to admission of students, organizing examination, infrastructure for students and financial support for the academic programs. These have reduced the administrative requirement at the Central office, which focuses more on continuous improvement in academic programs, schemes for student mobility across CIs and maintenance of uniformly high academic standards. The present Chancellor of HBNI is former Secretary of the DAE. The Chairman of the Council of Management is the current Secretary of DAE. The leadership of the University by the highest authority in the Department has provided the necessary thrust to the University to introduce courses that would be of value to the mission programs of the Department, and create an impact on the society, which are two important objectives of the University.

Such structure has led to the success of HBNI in terms of high value contributions to the Department and to the Society at large, the twin objectives with which it was set up.

6.1.2 The effective leadership is reflected in various institutional practices such as decentralization and participative management.

Response:

HBNI is a unique research University, integrating the academic strengths of ten CIs and one OCC, each having its own mission and areas of research specialization. HBNI has to account for the diversity and at the same time synergize the strengths of its CIs/OCC. To meet this requirement, the organizational structure of HBNI is indeed truly decentralized. The responsibilities for activities such as selection and admission of students, payment of fellowships, guidance and monitoring of progress of students, redressal of grievances of students, organization of exams and providing hostel accommodation are under the purview of the CI/OCC. The Director of the CI/OCC provides overall guidance to the academic programs at the CI and sets up necessary organizational structures for the conduct of the academic programs with rigor. Discipline specific Standing Academic Committees are set up at each CI which evaluate research proposal, allocate guide, prescribe the course work for the students and also forms the Doctoral Committee. Every CI/OCC has one or more Deans (Academic), depending on the disciplines handled by the CI/OCC, and one Dean (Student Affairs) and a Nodal Officer who handle all the academic Governance and students' welfare activities. The Central Office provides overall governance for the academic programs and ensures harmony in processes adopted in the CIs/OCC, adherence to guidelines of statutory bodies and uniform, high standards in every process.

The success of the academic integration referred to above has been greatly facilitated by the participatory management approach. The Academic Council of HBNI has Directors of all the CIs/OCC as well as conveners of Boards of Studies as its members. All major decisions on academic programs and processes are made in the Academic Council with participation of all the important functionaries of HBNI. This has ensured that the institutions are able to meet their individual objectives and at the same time, adhere to a common set of academic standards and processes. Similarly, the Standing Committee of Deans (SCD) of HBNI, chaired by Vice Chancellor, has as its members Deans (Academic) and Deans (Student Affairs) of all CIs and OCC. The finer aspects of academic governance are discussed in detail in the meetings of SCD.

The procedure adopted for the revision of Academic Ordinances of HBNI in the year 2017-18 is an example that clearly illustrates the philosophy of participative management. Considering the comprehensive changes required, the revised ordinances were first drafted through several detailed deliberations within the Central Office. These were then discussed in meetings of the Standing Committee of Deans, where Deans (Academic) from all CIs and OCC participated and shared their views. The ordinances were then discussed in the Academic Council, where the Directors of CIs/OCC as well as academic experts from outside HBNI provided a number of important inputs. The revised ordinances were finally placed in the Council of Management which also made many important suggestions. The revised ordinances issued in Dec. 2018 had the inputs from all the academic functionaries.

6.2 Strategy Development and Deployment

6.2.1 The institutional Strategic plan is effectively deployed.

Response:

One of the elements of the strategic plan of HBNI is to introduce additional academic programs focused on skill and professional development. HBNI endeavors to create and organize courses and programs that meet growing requirements of nuclear science and engineering and their applications for benefit of the country. These programs benefit not only employees of DAE units, but also the practicing professionals in industries and other institutions. Along these lines, HBNI has initiated important professional and skill-based programs and strengthened on-going professional courses. Some examples are given below:

- Professional courses in health sciences: Two professional courses, namely MD in Nuclear Medicine and DM in Onco-Pathology have been introduced**.**Nuclear medicine is a branch of medicine that uses a small quantity of radioactive material (radiopharmaceutical) to diagnose, evaluate, or treat a variety of diseases in a safe, painless, and cost-effective way. Two CIs of HBNI, namely BARC and TMC, have initiated this academic program with the approval of Academic Council. Presently, TMC and BARC together offer 12 MD (Nuclear Medicine) seats per year with the permission of MCI. In addition to this, TMC has also introduced an important DM program in Onco-Pathology with three seats per year. This branch of science deals with the study of malignant and non-malignant tumours, metastasis, tumorigenesis, and carcinogenesis.
- TMC has significantly increased the number of seats in many on-going DM, MCh and MD professional programs during the last few years, towards meeting the demand for such professionals in the country. Some of these are:

  M.Ch. (Surgical Oncology) - by eight seats

  M.Ch. (Plastic & Reconstructive Surgery), D.M. (Medical Oncology) and M.D. (Palliative Medicine) - by two seats each

  D.M. (Interventional Radiology), D.M. (Paediatric Oncology), D.M.(Critical Care Medicine) - by one seat each.

- Diploma in Analytical Chemistry: With analytical techniques and instrumentation becoming ever more sophisticated, there is an increasing demand for qualified analytical chemists in the industry. However, due to the high capital cost as well as maintenance cost, such sophisticated instruments are not affordable by most of educational institutes. Therefore, chemistry graduates coming from the educational institutes lack the skill or knowledge base to handle such techniques or instruments. With a high level of expertise in analytical chemistry and world class analytical equipment available in its CIs, HBNI is uniquely placed to offer courses to upgrade the skills of chemists. Accordingly, a diploma course in analytical chemistry has been introduced in BARC.
- Introduction of MSc (Radiopharmacy) course: This is another skill-based program introduced in TMC with the approval of Academic Council. This course provides opportunities to the students to develop knowledge, understanding and skills in principles and practice of radiopharmaceutical science and equips them to work as a radiopharmaceutical scientist.

The above mentioned courses are unique courses of high value, available only in a few Universities in the country. HBNI will continue its endeavour to identify and offer more such skill-based and professional

courses for the benefit of the society and country.

File Description	Document
Strategic Plan and deployment documents on the website	View Document

6.2.2 The functioning of the institutional bodies is effective and efficient as visible from policies, administrative setup, appointment and service rules, procedures, etc.

Response:

HBNI is a Grant-in-aid Institute (GIA) of the DAE. HBNI integrates and regulates the academic activities carried out under 4 DAE units and seven GIAs. Each of these institutions is an organisation of high repute, and most of these have been established well before the formation of HBNI. To provide a high level of autonomy to these institutions to pursue their mandates, and at the same time to ensure adherence to common academic policies, a unique organisational structure has been devised by DAE.

The apex body that oversees the functions of HBNI and provides overall guidance and directions, particularly in the domain of administration and finance is the Council of Management (CoM), headed by Secretary, DAE. This body ensures that the intent of formation of HBNI, and its adherence to Government guidelines and procedures, are ensured. To aid the Council of Management in the finance matters, a Finance Committee has been constituted, which is responsible for the budget of the institute and preparation of annual accounts, for submission to CoM and thereafter to the Government.

The Academic Council, chaired by the Vice Chancellor, is the principal academic body of the Institute and is responsible for the maintenance of standards of teaching, research and training, approval of syllabus, according recognition to faculty, co-ordination of research activities, examinations and tests within the Institute. The Directors of all the CIs and OCC are members of this body, which ensures that the academic programs of HBNI have uniform and high standards.

The Planning & Monitoring Board is the main planning body of the Institute and is responsible for the monitoring of the development programmes of the Institute.

Board of Studies have been constituted for each major discipline to oversee various processes in the design and conduct of the academic programs. The BoS have members drawn from all CIs/OCC to ensure uniform implementation of academic policies.

The Vice Chancellor, Dean and Registrar are recruited as per recruitment rules specifically approved by Government. The other officers of HBNI are on the rolls of BARC and are given suitable designations to carry out HBNI functions. The service rules of the Government apply to these officers.

In general, the Rules/Regulations of the Government and clarifications issued by Government under these Rules from time to time are applicable to all the employees serving HBNI. These include tenure of service, promotion policies, Pay and allowances, pension rules, accommodation, leave rules, etc. The CCS (Conduct) Rules and CCS (CCA) Rules and the Govt. of India Orders/OMs/Clarifications issued under

these Rules will be applicable to the employees of HBNI.

For addressing and redressal of grievance of students, a Grievance Redressal Committee exists in each of the CIs/OCC and also at the Institute level. A womens' cell has also been constituted at the CI level as well as Institute level.

The unique administrative and academic structure of HBNI has aided in its smooth functioning and promoted excellence in every sphere of its activities.

File Description	Document
Link to Organogram of the University webpage	View Document

6.2.3 Institution Implements e-governance covering following areas of operation

1. **Administration**
2. **Finance and Accounts**
3. **Student Admission and Support**
4. **Examination**

Response: A. All of the above

File Description	Document
Screen shots of user interfaces	View Document
ERP (Enterprise Resource Planning) Document	View Document
Details of implementation of e-governance in areas of operation, Administration etc (Data Template)	View Document
Link for additional information	View Document

6.3 Faculty Empowerment Strategies

6.3.1 The institution has a performance appraisal system, promotional avenues and effective welfare measures for teaching and non-teaching staff .

Response:

The CIs and OCC of HBNI are either DAE units or Grant-in-aid institutions of DAE. All the CIs/OCC follow a robust and transparent mechanism of appraisal of performance of the staff, as per DAE guidelines. The faculty as well as non-teaching staff provide an Annual Performance Appraisal Report (APAR) to the Department, as a part of the Annual Performance Appraisal System. The report is designed differently for Officers and Technical employees. The APAR is evaluated based on several attributes covering personal qualities, work output and functional competency, with weightage factors depending on the role played by staff member. The assessment by the immediate superior is reviewed by a reviewing officer and finally by

the Head of the Group or the Head of the Unit. The APAR grading is conveyed to the officer reported upon and opportunity is given to make any representation with respect to the grading. The representation of the individual is dealt as per the procedure. A unique Performance Related Incentive Scheme (PRIS) is operated by DAE, which provides incentive to all the employees based on their individual performance and collective performance with respect to specific targets. There is a DAE Awards Scheme having awards in different categories. In addition, HBNI also has its own awards scheme for outstanding students and faculty members.

The DAE units operate a unique promotion scheme based only on merit, in the case of teaching as well as non-teaching scientific and technical staff. As per this scheme, the staff are promoted to the next higher grade after meeting performance requirements, without linkage to availability of a vacancy.

All the administrative and accounts personnel are governed by a set of common rules approved by DAE. Promotional avenues are available for all the categories of employees to climb the ladder in their career, subject to availability of vacancies in the respective cadre. In addition, after completion of a minimum residency period in a cadre, the employee is eligible to be empanelled for a higher post after passing a qualifying examination and an interview. Key managerial posts such as Chief Administrative Officer and Internal Finance Officer are filled by transfer, promotion or through fresh recruitment by advertisement for the vacant post.

The teaching as well as non-teaching staff in the CIs/OCC enjoy all the welfare measures offered by the Government to its employees. These include residential accommodation where available (or house rent allowance), transport facility, Leave Travel Concession (LTC) benefit, House Building Advance at concessional interest rates for construction of houses, update allowance, Welfare Scheme covering Insurance and Savings called “Group Insurance Schemes”, Children Education Allowance, etc. DAE offers hospital facilities at many of its sites, and also operates a unique Contributory Health Service Scheme that provides immense medical benefits to its employees. All the employees are governed by Pension or Contributory Provident Fund based upon their option. Special benefits are available to female employees such as Maternity Leave and Child Care Leave as per Government rules.

File Description	Document
Any additional information	View Document

6.3.2 Average percentage of teachers provided with financial support to attend conferences / workshops and towards membership fee of professional bodies during the last five years.

Response: 40.83

6.3.2.1 **Number of teachers provided with financial support to attend conferences/workshops and towards membership fee of professional bodies year wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
608	418	398	380	327

File Description	Document
Details of teachers provided with financial support to attend conferences, workshops etc. during the last five years (Data Template)	View Document
Link for Additional Information	View Document

6.3.3 Average number of professional development / administrative training Programmes organized by the institution for teaching and non-teaching staff during the last five years.

Response: 24.6

6.3.3.1 **Total number of professional development /administrative training Programmes organized by the institution for teaching and non teaching staff year-wise during the last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
26	27	30	10	30

File Description	Document
Reports of the Human Resource Development Centres (UGC ASC or other relevant centres)	View Document
Reports of Academic Staff College or similar centers	View Document
Details of professional development / administrative training Programmes organized by the University for teaching and non teaching staff (Data Template)	View Document
Any additional information	View Document
Link for Additional Information	View Document

6.3.4 Average percentage of teachers undergoing online/ face-to-face Faculty Development Programmes (FDP)during the last five years (Professional Development Programmes, Orientation / Induction Programmes, Refresher Course, Short Term Course).

Response: 2.52

6.3.4.1 **Total number of teachers attending professional development Programmes, viz., Orientation Programme, Refresher Course, Short Term Course, Faculty Development Programmes year wise during last five years**

2018-19	2017-18	2016-17	2015-16	2014-15
116	10	4	3	3

File Description	Document
Reports of the Human Resource Development Centres (UGC ASC or other relevant centers)	View Document
IQAC report summary	View Document
Details of teachers attending professional development Programmes during the last five years (Data Template)	View Document
Any additional information	View Document
Link for Additional Information	View Document

6.4 Financial Management and Resource Mobilization

6.4.1 Institutional strategies for mobilisation of funds and the optimal utilisation of resources

Response:

HBNI is a grant-in-aid institution (GIA) of DAE, Government of India, and is fully funded by DAE. The CIs / OCC of HBNI are either units of DAE, or grant-in-aid institutes of DAE. Thus, HBNI and its CIs/OCC receive grants from DAE as per Government procedures and there is usually no need to look for additional financial resources.

Funds for BARC, IGCAR, RRCAT and VECC, which are DAE units, are received from Central Government for Capital as well as Revenue Sectors through budget allocation provided by Ministry of Finance. For this, Budget proposals are submitted to DAE for consolidation and eventual submission to Ministry of Finance. Based on the gross allocations made by Ministry of Finance, DAE makes object head-wise allocations to its constituent Units based on which the expenditure is incurred by the DAE units. Commitments and Expenditure are monitored on a regular basis through Project Coordinators and Accounts Division. Any additional funds found to be required through such monitoring are sought for from DAE or excess fund is surrendered through re-appropriation at Final Requirement stage which is prepared in January each year. Thus, a robust system is in place for mobilization of funds and its optimal utilization.

All the expenditure for the operation and maintenance of the seven GIA, which are CIs/OCC of HBNI, including the salaries and fellowships to be paid to the faculty / non-teaching staff and research scholars are met from the budgetary grant each year. For this purpose, comprehensive annual budgetary requirements along with monthly expenditure projection of the current and next financial years are presented to the Department for its consolidation and approval. Similarly, the grants for the creation of Capital Assets including infrastructure and experimental facilities are released by the Department on

quarterly basis on consideration of the particulars submitted by the GIAs. The un-utilised portion of grants are adjusted by the Department against the future grants under consideration for release.

In addition to the above-mentioned grants, some of the CIs/OCC also receive funding from other Government departments such as DST, DRDO, CSIR for specific projects. Some GIAs such as TMC also receive grants/endowments from beneficiaries/ well-wishers for special schemes such as providing benevolent support to the underprivileged in cancer treatment. In the recent past, HBNI central office has also received endowment funds for instituting schemes for promoting excellence among students.

The utilization of the grants is closely monitored by a dedicated finance unit at all the CIs/OCC, and depending upon the item of expenditure and the quantum of funds required, various statutory committees scrutinize the proposal before approval by the Apex body. The expenditure at Central office is closely monitored by Finance committee for optimum utilization of funds. Wherever major expenditure is to be incurred, the approval process involves various stages of scrutiny, and approval is accorded by the Apex body, the Council of Management. In all cases, Government guidelines / norms are always adhered to.

6.4.2 Funds / Grants received from government bodies during the last five years for development and maintenance of infrastructure (not covered under Criteria III and V) (INR in Lakhs).

Response: 10599.53

6.4.2.1 ***Total Funds / Grants received from government bodies for development and maintenance of infrastructure (not covered under Criteria III and V) year wise during the last five years (INR in Lakhs).***

2018-19	2017-18	2016-17	2015-16	2014-15
4487.28	3622.55	1567.44	596.08	326.18

File Description	Document
Details of Funds / Grants received from government bodies during the last five years (Data Template)	View Document
Annual statements of accounts	View Document
Link for Additional Information	View Document

6.4.3 Funds / Grants received from non-government bodies, individuals, philanthropists during the last five years (not covered in Criterion III and V) (INR in Lakhs)

Response: 9598.56

6.4.3.1 Total Grants received from non-government bodies, individuals, Philanthropers year wise during the last five years (INR in Lakhs)

2018-19	2017-18	2016-17	2015-16	2014-15
1729.33	821.74	4882.55	1235.61	929.33

File Description	Document
Institutional data in prescribed format	View Document
Annual statements of accounts	View Document
Link for Additional Information	View Document

6.4.4 Institution conducts internal and external financial audits regularly

Response:

Homi Bhabha National Institute (HBNI) is a Grant-in-Aid Institution (GIA) of Department of Atomic Energy (DAE), Government of India, and is fully funded by DAE. The CIs / OCC of HBNI are either units of DAE, or grant-in-aid institutes of DAE. Thus, HBNI and its CIs/OCC receive grants from DAE as per Government procedures. The expenditures are incurred in the most optimum manner by following the guide lines issued by Ministry of Finance, Department of Atomic Energy and following all Financial rules and Regulations of Government of India.

In accordance with HBNI Financial Rules, 2014 Rule 2, the Institute adopts the General Financial Rules (GFR), Civil Account Manual for accounting the Grants-in-Aid received from DAE. Utilisation Certificates are being furnished to DAE at the end of each financial year. Also, as per Rule 4 (a) of HBNI Financial Rules, 2014, HBNI is registered as a Charitable Institution under the Bombay (Mumbai) Public Trust Act, 1950 (Charity commission, Mumbai) and therefore, audited financial statements are being filed every year also with Charity Commission.

As per Rule 4 (e) of HBNI Financial Rules, 2014, yearly auditing of accounts of the Institute is done by a Chartered Accountant (Statutory Auditor) appointed by the Institute with the approval of Council of Management. The Statutory auditor certifies the financial statement of the institute on a yearly basis. The certified Financial statement duly approved by the Council of Management and signed by the Reporting Trustee is filed with the office of the Charity Commissioner, Mumbai every year. The certified financial statement is also included as part of the annual report of HBNI, which is approved by Council of Management of HBNI, and forwarded to DAE for tabling in the Parliament.

The Institute Finance Committee, chaired by Vice Chancellor, and having two joint secretaries in DAE as well as the Finance Officer as its members, discusses and approves the finance statement, each year, and also discusses comments / audit paras, if any. HBNI has not so far received any objections from audit regarding the finance statements.

HBNI being a Grant-in-Aid Institution of DAE, all finance records are liable to be audited on yearly basis by Internal Inspection Wing of the DAE and external audit by the Director General of Audit (Scientific

Departments), Indian Audit & Accounts Department, Mumbai Branch under Comptroller and Auditor General (C & AG).

The CIs/OCC of HBNI are either DAE units or Grant-in-aid institutes fully funded by DAE. Thus all CIs and OCC of HBNI follow a similar, DAE approved practice with regard to internal and external auditing of accounts. The Department of Purchase and Stores, which handles the procurement activities of the DAE units, has an internal audit wing, which pre-audits all major purchase orders before they are approved for placement.

File Description	Document
Any additional information	View Document
Link for Additional Information	View Document

6.5 Internal Quality Assurance System

6.5.1 Internal Quality Assurance Cell (IQAC) has contributed significantly for institutionalizing the quality assurance strategies and processes by constantly reviewing the teaching learning process, structures & methodologies of operations and learning outcomes at periodic intervals.

Response:

Internal Quality Assurance Cell is a body of high importance in the University system, bringing in as it does quality improvements in several domains and serving as a sounding board for the management in its quest for excellence. The IQAC debates on a variety of subjects including teaching and learning processes, academic and physical infrastructure, student progression, faculty empowerment etc. and provides recommendation to the University to take appropriate steps.

The academic and administrative structure of HBNI is unique. The CIs and OCC are administratively independent; they are also solely responsible for several academic functions such as selection and admission of students, infrastructure development and student support as first responders, proposal / revision of courses to support their mission programs, etc., at the same time following uniform, overarching guidelines arrived at the University level. The CIs and OCC accordingly have their own bodies / forums that look at quality improvements with regard to academics as well as administration. In addition, HBNI Central Office also drives the quality movement, designing and implementing new processes / procedures across the CIs/OCC, to enhance the delivery of quality measures.

At HBNI, IQAC was first set up in 2014 and its functioning has been strengthened in the recent years.

- Timeline for Ph.D programs: it was noted that the total time taken for award of Ph.D degree after submission of thesis needed to be reduced to enable students to move on in their career. The procedural steps after submission of synopsis by the student were reviewed and it was concluded that the review of thesis can be speeded up by forwarding the thesis to three reviewers simultaneously instead of two. This was deliberated in several meetings of SCD and has now been implemented in the Academic Ordinances issued in 2018.

- Feedback from stakeholders: the feedback from the students indicated that a broader choice of courses would be of great benefit to the students. The ordinances have accordingly been modified to permit students to acquire course to the extent of 20 % by self-study of courses offered by NPTEL or other MOOC platforms or credit seminars. This has been now codified in the Academic Ordinances issued in 2018, and has proved to be a welcome measure, as it has provided a lot of flexibility to the students.

File Description	Document
Link for Additional Information	View Document

6.5.2 Institution has adopted the following for Quality assurance 1. Academic Administrative Audit (AAA) and follow up action taken 2.Confernces, Seminars, Workshops on quality conducted 3. Collaborative quality initiatives with other institution(s) 4.Orientation programme on quality issues for teachers and students 5. Participation in NIRF 6.Any other quality audit recognized by state, national or international agencies (ISO Certification, NBA).

Response: B. 4 of the above

File Description	Document
Upload e-copies of the accreditations and certifications	View Document
Upload details of Quality assurance initiatives of the institution (Data Template)	View Document
Any additional information	View Document
Paste web link of Annual reports of University	View Document

6.5.3 Incremental improvements made for the preceding five years with regard to quality (in case of first cycle), Post accreditation quality initiatives (second and subsequent cycles).

Response:

Post-accreditation (2015), HBNI has taken several quality improvement initiatives, to address the areas of improvement that came to light during the accreditation process and to further enhance the Institute's performance. Some of these quality initiatives are given below:

1. The academic ordinances have been refined, with the objective of enhancing the clarity of academic processes (eg. Credit assignment), to cover all new programs introduced subsequent to 2013, and to introduce more flexibility in the processes for the benefit of the student, eg. provision of forwarding the Ph.D thesis to 3 reviewers to enable reduction in the time taken for decision on the degree.
2. A higher emphasis is placed on skill development courses, value added courses and courses that could also benefit professionals in industry. Apart from increasing number of seats in many Diploma / Degree/ Fellowship courses, new courses have been introduced.

3. The Anunet website of HBNI was populated with a large number of video lecture courses obtained from NPTEL. A number of students have availed credit by self-study of these courses.
4. A formal procedure of feedback from students, faculty, parents and alumni is in place. This process has given valuable inputs regarding the strengths and weaknesses of HBNI and areas for improvement.
5. HBNI provides financial assistance to PhD scholars who are not employees of DAE, to participate in international conferences held abroad, to present a paper. The Foreign travel assistance has been reviewed and enhanced to enable research scholars to attend important international conferences.
6. Placing high emphasis on ethics, Guidelines have been issued for authorship of papers for faculty and students, and all thesis are checked for plagiarism
7. HBNI has taken up the publication of books on topics of high relevance to nuclear science and technology, eg. Nuclear Reactor Physics, by involving present as well as past faculty of HBNI.e These books will be useful for the research students as well as trainees.
8. To coordinate the student affairs and provide them guidance with regard to administrative issues, one senior faculty member in each CI/OCC was designated as Dean (Student Affairs).
9. A formal program of induction of faculty has been introduced, in which the faculty are explained about the ordinances as well as the expectations from the faculty, and the faculty are also encouraged to obtain clarifications about the academic programs or processes.
10. The security features in the degree certificates were enhanced by incorporating the photograph of the student.
11. The academic awards issued by HBNI to its students have been lodged in digital format, to enable students to retrieve their awards at any time, and also get them verified, through an MoU with M/s CDSL.
12. The declaration of results and issue of provisional degree certificate (PDC) have been made faster. Now, the students of Ph.D programs invariably get their degree certificate within a few months after the completion of the viva voce examination.

Criterion 7 - Institutional Values and Best Practices

7.1 Institutional Values and Social Responsibilities

7.1.1 Measures initiated by the Institution for the promotion of gender equity during the last five years.

Response:

HBNI places high emphasis on gender equity, since it believes that a student has same potential to learn various subjects or develop various skills, and make unique contributions to the world of knowledge, independent of whether the student is a male or female. The CIs/OCC of HBNI have been taking several measures towards gender equity. In every sphere of academic activity, such as recognition of faculty, promotions, allocation of research students, etc., HBNI processes do not discriminate between male and female. In addition, every effort is made to empower and enable female students and researchers to reach performance levels commensurate with their capabilities, by extending certain facilities. It is pertinent to record that nearly 20 % of the faculty of HBNI are women.

The emphasis on gender equity is exemplified by the fact that the advertisement for BARC training School incorporates a specific statement that ‘DAE strives to have a workforce which reflects gender balance and women candidates are encouraged to apply’. The campuses of the CIs/OCC are all guarded by CISF or Departmental security or private security force. Adequate number of female security personnel and female doctors are employed to attend to women employees and students. Every CI and OCC has a Women’s cell set up as per Government guidelines, and they not only address concerns of women with regard to their safety or security, but also organize regular programs to provide exposure to women students and faculty to their rights and privileges, as well as health, safety, stress and security related issues. All the CIs and OCC celebrate International women’s day in an appropriate manner and arrange lectures by specialists, involving interactive sessions. Special programs are also arranged for girl students from schools and colleges. The Indian Women Scientists Association has an active chapter in the larger CIs, and the women faculty organize science events including interaction sessions with research scholars. The IMSc also organizes exhibitions with the theme of women in science, which are well appreciated.

Female researchers are permitted to avail maternity leave a per Government guidelines, with corresponding extension to the academic tenure, so that the leave does not have any impact on their academic program. Female as well as male employees are also given child care leave as per Government guidelines to attend to their wards. The larger of the campuses (eg. BARC, IGCAR, RRCAT) have day care center for young children in the townships. HBNI women faculty members are deputed to women centric conferences organized by Government bodies, particularly those with themes related to women empowerment.

File Description	Document
Specific facilities provided for women in terms of: a.Safety and security b. Counselling c. Common Rooms d. Day care center for young children e. Any other relevant information	View Document
Annual gender sensitization action plan	View Document

7.1.2 The Institution has facilities for alternate sources of energy and energy conservation measures

1. **Solar energy**
2. **Biogas plant**
3. **Wheeling to the Grid**
4. **Sensor-based energy conservation**
5. **Use of LED bulbs/ power efficient equipment**

Response: A. 4 or All of the above

File Description	Document
Geotagged Photographs	View Document
Any other relevant information	View Document

7.1.3 Describe the facilities in the Institution for the management of the following types of degradable and non-degradable waste (within 500 words)

- **Solid waste management**
- **Liquid waste management**
- **Biomedical waste management**
- **E-waste management**
- **Waste recycling system**
- **Hazardous chemicals and radioactive waste management**

Response:

CIs and OCC of HBNI being institutions under the DAE umbrella, there is comprehensive attention to environment and sustainability issues.

The key words for an effective waste management strategy are: reduce, reuse and recycle. All these are practiced rigorously in the CIs/OCC of HBNI. High emphasis is placed on reducing the quantity of waste by suitable practices at the source of its generation. Recycling is an important philosophy, especially for liquid waste, eg., treated effluent water is used for maintaining the landscaped areas and gardens.

Municipal solid waste generated from all the buildings, road and open areas in the campuses are collected and disposed off suitably to the concerned local body. Residents have been asked to segregate the wastes at the source of generation itself. Biodegradable organic waste is disposed using soil bacteria composting technique. Biogas plants have been set up in some of the CIs to manage bioorganic waste. In BARC and RRCAT, for example, the bio-gas so produced is used in the hostel kitchen as fuel. IGCAR has set up a biological waste water treatment technology plant and a Nisargruna Biogas plant at its township.

Sewage water treatment plants have been set up in the campuses of CIs/OCC, and the waste water, after treatment, is used for watering gardens. Chemical waste, in liquid form, is collected and disposed after suitable treatment and dilution as necessary.

At TMC, the Bio-medical Waste Management (BMWM) rules notified by the Government have been implemented since 1999 by treating the biomedical waste in-house, using a Hydroclave, a first in the country. TMH has continued to make further improvements in BMWM practices. BMW is now segregated into various categories and sent to a centralized facility everyday for treatment and disposal. All laboratory waste is autoclaved in-house before sending it for disposal.

E-waste management: Wherever permissible by procedures, computers are purchased on exchange basis, so that the number of computers to be disposed is reduced. Computers found to be unsuitable for advanced computations but still in working condition are made available to other departments that can use them. Computers to be disposed are sold/auctioned to a Certified E-Waste Recycler.

Hazardous waste: At BARC, solid as well as liquid chemical wastes with hazard potential are incinerated in a chemical incinerator. Radioactive liquid waste generated during experiments is collected and disposed by following stringent regulations of safety committees / Atomic Energy Regulatory Board. Research programs of some of the CIs such as BARC involve handling of chemically toxic and radioactive materials. Safe management of chemical and radioactive waste has been practiced rigorously since the inception of these institutions. The other CIs/OCC have also implemented similar approach with regard to waste management issues more specific to their activities. BARC and IGCAR are also pursuing R & D programs to develop processes for reducing the generation of radioactive waste and recovering useful elements from radioactive waste generated from processing of irradiated fuels.

File Description	Document
Geotagged photographs of the facilities	View Document
Any other relevant information	View Document

7.1.4 Water conservation facilities available in the Institution:

1. **Rain water harvesting**
2. **Borewell /Open well recharge**
3. **Construction of tanks and bunds**
4. **Waste water recycling**
5. **Maintenance of water bodies and distribution system in the campus**

Response: A. Any 4 or all of the above

File Description	Document
Geotagged photographs / videos of the facilities	View Document
Any other relevant information	View Document

7.1.5 Green campus initiatives include:

1. **Restricted entry of automobiles**
2. **Use of Bicycles/ Battery powered vehicles**

3. **Pedestrian Friendly pathways**
4. **Ban on use of Plastic**
5. **landscaping with trees and plants**

Response: Any 4 or All of the above

File Description	Document
Various policy documents / decisions circulated for implementation	View Document
Geotagged photos / videos of the facilities	View Document
Any other relevant documents	View Document

7.1.6 Quality audits on environment and energy regularly undertaken by the Institution and any awards received for such green campus initiatives:

1. **Green audit**
2. **Energy audit**
3. **Environment audit**
4. **Clean and green campus recognitions / awards**
5. **Beyond the campus environmental promotion activities**

Response: D.1 of the above

File Description	Document
Certificates of the awards received	View Document
Any other relevant information	View Document

7.1.7 The Institution has disabled-friendly, barrier free environment

1. **Built environment with ramps/lifts for easy access to classrooms.**
2. **Disabled-friendly washrooms**
3. **Signage including tactile path, lights, display boards and signposts**
4. **Assistive technology and facilities for persons with disabilities (Divyangjan) accessible website, screen-reading software, mechanized equipment**
5. **Provision for enquiry and information : Human assistance, reader, scribe, soft copies of reading material, screen reading**

Response: A. Any 4 or all of the above

File Description	Document
Policy documents and information brochures on the support to be provided	View Document
Geotagged photographs / videos of the facilities	View Document
Any other relevant information	View Document

7.1.8 Describe the Institutional efforts/initiatives in providing an inclusive environment i.e., tolerance and harmony towards cultural, regional, linguistic, communal socioeconomic and other diversities (within 500 words).

Response:

HBNI and its constituent institutions and off-campus centre are either DAE units or grant-in-aid institution of DAE. Thus, HBNI as well as its CIs/OCC are under the umbrella of DAE and pursue all directives of the Government, including providing opportunity to all sections of the society. As an institute open to all, HBNI has only merit as its sole criterion in every process, and does not discriminate in any manner between students or faculty based on any factors such as region, community or language. In addition, HBNI has actively promoted merit and created an ambience in which the students and faculty from all over the country pursue their academic interests without any concern relating to discriminatory practice. The CIs/OCC of HBNI regularly organise programs where all students participate and present their talent. Whether it is cultural program, outreach program or extension program, students from diverse regions participate in a harmonious manner. Festivals of all regions are enthusiastically celebrated by all students and faculty. The pledge administered on the occasion of Sadhbhavana Diwas to all students and faculty clearly emphasises the commitment for emotional oneness and harmony. The CIs and OCC organize annual musical events in which students and faculty members from different parts of India participate. In the Students Hostels, all type of festivals from different regions of the Country are celebrated by committees, which have members from different parts of the country. Likewise, there are Hindi essay and poem competitions in which a large number of non-Hindi speaking members not only participate but win the top prizes also. Same is true for Marathi and other regional languages related events. BARC Staff club and other similar clubs in the CIs/OCC conduct several events which contribute significantly towards harmony among the diversity.

File Description	Document
Supporting documents on the information provided (as reflected in the administrative and academic activities of the Institution)	View Document

7.1.9 Sensitization of students and employees of the Institution to the constitutional obligations: values, rights, duties and responsibilities of citizens (within 500 words).

Response:

The CIs and OCC of HBNI are either DAE units or Grant-in-aid institutions funded by DAE. Since all the CIs/OCC are under the umbrella of a Government organization, they fully abide by the mandates of the Government. Thus, HBNI not only develops outstanding scientists / engineers /medical & health specialists, but also focuses on inculcating the values required to groom the students as responsible citizens. The service rules of the employees at Central Office as well as the CIs/OCC are in line with Government rules, and therefore, the faculty, non-teaching staff and students are trained to follow due procedures with particular emphasis on probity and accountability.

1. The employees as well as students participate in special commemorative events organized by the CIs/OCC throughout the year. For example, Constitution Day is celebrated on 26th of November every year as part of birth anniversary celebrations of Dr. B.R. Ambedkar. As part of celebrations, the preamble to constitution is read out in Hindi and English, and one of the senior colleagues (usually the Head of the institution) also briefs the participants about the importance and special features of Indian constitution. Debate programs or lecture on constitution are also organized on this day.
2. The employees and students take pledges- to promote National Integration and Communal Harmony among people of all religions, languages and regions on the occasion of Sadbhavana Diwas; to preserve the unity, integrity and security of the nation on the occasion of Rashtriya Ekta Divas; Anti-terrorism pledge on the occasion of the death anniversary of former PM Sri Rajiv Gandhi; to bring about integrity and transparency as a part of the Vigilance awareness week programs.
3. Hindi being the official language of India, students and employees are exhorted to use Hindi in their communications. The Hindi Day is celebrated in an appropriate manner, with the participation of staff and students. The Central office also organizes Hindi diwas celebration in which a technical lecture is delivered in Hindi, and a competition organized among office staff to assess their knowledge of Hindi. Some of the CIs also host the All India Official Language meet of the Department of Atomic Energy.
4. In recent years, with the emphasis on Swacch Bharat Mission, all the CIs and OCC have been conducting special cleanliness drives with the involvement of students and faculty.

HBNI employees are constantly advised to extend appropriate courtesy and help to the underprivileged, especially the physically handicapped; the doctoral committees are also advised to extend the tenure of female students without any additional fee, if they have to avail maternity leave.

7.1.10 The Institution has a prescribed code of conduct for students, teachers, administrators and other staff and conducts periodic programmes in this regard.

1. **The Code of Conduct is displayed on the website**
2. **There is a committee to monitor adherence to the Code of Conduct**
3. **Institution organizes professional ethics programmes for students, teachers, administrators and other staff**
4. **Annual awareness programmes on Code of Conduct are organized**

Response: B. 3 of the above

File Description	Document
Details of the monitoring committee composition and minutes of the committee meeting, number of programmes organized, reports on the various programs etc., in support of the claims	View Document
Code of ethics policy document	View Document
Any other relevant information	View Document

7.1.11 Institution celebrates / organizes national and international commemorative days, events and festivals (within 500 words).

Response:

The CIs/OCC of HBNI being either DAE units or Grant-in-aid institutes of DAE, there is an inherent emphasis on celebration of national festivals. The CIs/OCC take great pride in celebrating the Republic Day and the Independence Day. The Directors of the CIs/OCC lead these celebrations, unfurling the National Flag and addressing their staff. At the Central Office, Vice Chancellor unfurls the national flag and addresses the colleagues, on both the occasions. In addition, music and dance programs in praise of the country and the pioneers of the freedom movement are organized.

Anniversaries of great Indian personalities are observed, breaking all barriers of religion and caste. Special significance is attached to National Science Day (28 February, in memory of Sir C.V.Raman's discovery of Raman Effect), National Technology Day (11 May) and Engineers' Day (Sep. 15th). Several programs are organized on the National Science Day, including screening of documentaries, science lectures by eminent personalities and visit programs of school / college students to important research facilities. On 22nd December, National Mathematics Day is celebrated by some of the CIs by organizing a lecture or documentary show to highlight S. Ramanujan's contribution to mathematics. Similarly, the Teachers' Day on 5th September (Dr. S. Radhakrishnan's birthday) is a special day of celebration for HBNI. Students in various CIs/OCC organize programmes on that day to pay their respect to the teachers and have a get together with them. BARC organizes special programs each year to mark the birthday of Homi Bhabha (Oct. 30). SINP organizes Saha memorial lectures each year, and in 2018, SINP organized an year long program to commemorate the contributions of Saha, including a lecture by Nobel Laureate Harold Eliot Varmus. Central Office also organized a popular program to commemorate the 125th birth anniversary of Meghnad Saha and Satyendra Nath Bose.

On Gandhi Jayanthi (2nd October), the CIs/OCC organize a cleaning drive to clean the surroundings of the campus every year. During 2018-19, CIs/OCC displayed the logo marking the 150th birth anniversary of Gandhi in various official communications and websites. Dr. Ambedkar's birth as well as the death anniversary are commemorated in appropriate manner, to bring awareness to the students and faculty the great contributions of Dr. Ambedkar, and the commitment of the Government for the weaker sections of the society.

The CIs and OCC of HBNI also celebrate local festivals / birthdays of pioneers of local origin. For example, HRI celebrates Rabindranath Tagore's birth/death anniversary (07th May & 07th August) wherein students organize Rabindra Sangeet, poem recitation, drama etc.

HBNI central office as well as the CIs/OCC organize programs to mark the international commemoration of pioneers and their discoveries. HBNI organized two programs to commemorate the International year of periodic table in 2019. Similar programs were also held at IGCAR and SINP. The International Women's day is also organized in a befitting manner, with some CIs organizing quiz programs and interactive sessions.

File Description	Document
Geotagged photographs of some of the events	View Document
Any other relevant information	View Document
Annual report of the celebrations and commemorative events for the last five years	View Document

7.2 Best Practices

7.2.1 Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.

Response:

BEST PRACTICE-I

Title of the Practice

To make available the extensive and unique experimental facilities available with DAE Institutions for advanced research by HBNI students and faculty and also other Research Institutions/Universities

Objectives of the Practice

The CIs/OCC of HBNI have unique, state-of-the art research facilities, such as nuclear reactors, accelerators, etc. HBNI aims to advance indigenous nuclear technological capability by making available these research facilities to the young research students. The experimental facilities are also extended to students of other Universities, with the twin objectives of enhancing the utilisation of the national facilities and aiding the development of human resources for the country.

The Context

DAE is pursuing indigenous development of materials, equipment, processes, systems and mega science facilities relevant to nuclear science and technology. Such a program involves challenging experiments such as measurement of properties of radioactive fuel, degradation of structural materials subjected to irradiation, production of radiopharmaceuticals, enrichment of nuclear fuel materials, radiation applications, etc. DAE has set up a wide variety of unique experimental facilities to address these R & D requirements, which are of high value, not only with regard to research on topics related to nuclear sciences, but also several other domains of science and technology.

The Practice

HBNI encourages faculty and students to take up research programs that make use of the immense experimental facilities available within DAE units. Apart from state of the art High Performance computing facilities, DAE has laboratories to cater to major experimental research activities in various disciplines. Some of the unique experimental facilities available are research reactors, accelerators, tokamaks, synchrotron, neutron spectrometers, large telescopes, laboratories for experiments with ultrapure / reactive/ radioactive materials, high temperature sodium test facilities, shake table for seismic simulations, facilities to study materials under extreme conditions, etc. Other advanced experimental facilities available in the CIs/OCC include crystal growth facilities, spectroscopic facilities, ultrafast chemistry, thin film deposition, plasma processing, laboratories for stress analysis, robotics and remote handling, electromagnetic forming/welding equipment, etc. The students of HBNI from various CIs/OCC have access to such unique and complex experimental facilities and thus develop unique expertise in challenging experimentation. DAE also participates in international collaborative ventures, viz. LHC, ITER, FAIR, Project X of Fermi Lab, LIGO, etc. Several HBNI students have the privilege of working with international teams on experiments, computations and instrumentation development related to these projects.

DAE units also make available the large experimental facilities to students from other organisations / universities, through a UGC-DAE consortium. The beamlines available at Indus synchrotron facilities at RRCAT are routinely used by researchers from other Universities. At BARC, university scientists and students are provided access to the National Facility for Neutron Beam Research (NFNBR) at Dhruva reactor. The Kolkata Center of the Consortium coordinates accelerator based experimental work, both in-beam and offline at the VECC and the 3 MV Pelletron at IoP. The Kalpakkam node provides access to the sophisticated scientific equipment of IGCAR for the university researchers. HBNI faculty are deeply involved in the collaboration programs pursued in these facilities.

Evidence of Success

The research problems selected by HBNI students have direct bearing on the ongoing programs of the department. The result of this is that the students get opportunities to work on sophisticated experimental facilities and their work gets published in high impact journals. At the same time, DAE gets valuable research inputs for the projects which are a part of its mission. It has been observed that more than 40% of the PhD dissertations involve experimental work using the unique facilities in DAE. The utilisation of the Indus synchrotron and other facilities by researchers across the country has continued to increase over time, producing excellent results in several domains of science. These are all evidences of success of such best practice.

Problems Encountered and Resources Required

The experimental facilities available in DAE units are under high level of security as they are considered as strategic installations. Use of some facilities involve handling of radioactive elements. Access to such facilities by students needs formal permissions and special training. Similarly, facilities are shared by many researchers at a time and students need to wait for getting access. These factors may lead to time pressure on completion of the academic program, in comparison to conventional universities. No difficulty has however, been encountered in terms of availability of funds to carry out research and payment of fellowships to the students, since such funds are provided by DAE as a part of their regular annual budget.

Best Practice – II

Title of the Practice

Capacity building in cancer treatment to meet national needs

Objectives of the Practice

One of the mandates of HBNI is to engage in the development and delivery of academic programs that can make significant impact on the society. With the growing incidence of cancers in India, there is an acute need to develop appropriate infrastructure and trained manpower for optimal delivery of quality cancer care in the country. The objective of the practice is to use academic programs as a tool to enhance the number of specialists to meet the growing requirements of cancer care in the country.

The Context

The annual Cancer incidence in India is approximately 1.1 million and this is expected to increase to 1.7 million cases by 2035. In India, there is a significant shortfall of trained manpower for cancer care and this gap is likely to increase further in future. Therefore, there is an urgent need to enhance the number of highly professional medical doctors, to provide relief to the patients, and also pursue innovative research towards understanding, avoiding and treating cancer. Such medical professionals will also provide leadership for guiding the national policy and strategy for cancer care and education to future students, hospital employees and public.

The Practice

Education and research in the area of oncology is primarily being pursued at Tata Medical Centre (TMC), which is one of the CIs of HBNI. It has a hospital called Tata Memorial Hospital (TMH) and a research centre called Advanced Centre for Treatment, Research and Education in Cancer (ACTREC). In TMH, MD post graduate programs are being pursued in eight specialised areas of Oncology. Similarly, DM and MCh programs are offered in ten super-speciality subjects, covering almost every important organ of the body.

In addition, six new PG programs have been started since 2006 under Health and Medical Board of Studies. These are M.Sc. (Nursing), M.Sc. (Clinical Research), M.Sc. (Nuclear Medicine and Molecular Imaging technology), M.Sc. (Public Health in Epidemiology), M.Sc. (Occupational Therapy in Oncology) and PG Diploma in Fusion Imaging Technology. These programs have helped in developing human resources in several allied domains of relevance to cancer research and treatment.

HBNI is also pursuing PhD programs in cancer research. During 2018-2019, twenty-seven students from HBNI completed their PhD programs in this area. In addition, twenty-two specialised two-year certified fellowship programs related to cancer treatment in specific organs have been started to meet ever growing requirements of manpower in this area.

To promote research in cancer, the TMH has well equipped laboratories and a cancer Research Secretariat. At ACTREC, each of the Principal Investigators have their own full-fledged research labs equipped with

most advanced experimental facilities. ACTREC also maintains vital research support facilities like Radioisotope room, Bacteriology room, Animal Facility for work involving experimental animals, Biorepository of tumour tissues required for research, Anti-Cancer Drug Screening facility, Tissue Culture facility, etc.

Evidence of Success

At the time of inception of HBNI in 2005, the total number of MD, DM and MCh seats available at TMC was merely 25. Presently, TMC has 79 MD, 30 DM and 34 MCh seats per year. The number of students passed out in 2010-2011 in MD, DM and MCh programs was 4 and the same number in 2018-2019 is 110. Total number of PhD thesis completed till March 31, 2019 in the area of cancer research is 91. Students passing out of associated M.Sc. programs listed above, are also very useful to the society in the area of cancer treatment, education and research.

The success of the academic program is evident from the fact that practically 70% of the oncology manpower in the country has been trained at sometime within these environs. It is a matter of great pride that oncologists educated in TMC are contributing immensely in the fight against cancer in India and abroad.

Problems Encountered and Resources Required

No difficulty has been encountered regarding availability of funds to carry out research and payment of fellowships to the students. Such funds are provided by DAE as a part of its regular annual budget. With the rapidly expanding scope and numbers of the academic program at TMC, there is also a significant increase in the facilities/ infrastructure required for maintaining and further improving the academic programs. It is essential to increase manpower in the academic cell of TMC as well as in the central office of HBNI to handle academic records of constantly increasing number of medical and health science students.

File Description	Document
Best practices in the Institutional web site	View Document

7.3 Institutional Distinctiveness

7.3.1 Portray the performance of the Institution in one area distinctive to its priority and thrust within 1000 words

Response:

Title: Advancement in Nuclear Science and Technology through Academic Programs

One of the distinctive characteristics of HBNI is its uniqueness as a research university, imparting knowledge and skills in the areas of nuclear sciences and engineering. HBNI was indeed established with the mission of encouraging pursuit of excellence in sciences (including engineering sciences) and mathematics in a manner that has major significance for the progress of indigenous nuclear technological

capability. While HBNI academic programs provide human resource base for developing technologies relevant to nuclear power generation, programs also address strategic sector and other national mission programs, health care and other societal sectors. Nuclear science is an inter-disciplinary subject and any institute involved in its development should have expertise in several branches, viz. physical sciences, chemical sciences, life science, engineering sciences, health sciences and mathematics. Thus, scope of nuclear engineering and consequently, that of HBNI is very vast. Eleven institutions under HBNI pursue R & D in several domains by taking advantage of their academic strength in specific areas.

Research programs in DAE have to target innovations towards enhancing safety and economics of nuclear power and applications of radioactivity and radiation, and also address emerging technologies. Involvement of inquisitive and young minds in this endeavor is an important recipe for achieving breakthroughs. Establishment of HBNI and its academic governance structure has made this possible.

Unique ambience: The CIs of HBNI have a wide range of facilities ranging from tabletop set up to mega science facilities such as research reactors, accelerators, tokamaks, etc. Computational resources available to faculty and students are quite extensive and faculty is well trained to build own instrumentation and facilities. Thus, doctoral students have unique opportunity to work on frontline areas, with world class facilities, and most importantly, with practicing professionals as guides. As a result, academic programs of HBNI have been able to deliver a lot in terms of research output. Increasing intake of doctoral students has contributed towards realizing the full potential of research infrastructure available and helped in accelerating development of indigenous technologies.

Emphasis on merit: HBNI is a research university and educates students at doctoral and masters level, and pursues research in accordance with the above discussed mandate. It is meritocratic in hiring and promotion of faculty, admission and progression of students and all other policy aspects. As a result, it has a high concentration of talent in its faculty members and students.

Wide options: DAE has pursued a science-based approach for development of nuclear power programme including associated fuel cycle. HBNI students have extensive options to choose their research topics related to technology of nuclear reactors and nuclear fuel cycle and underlying science. The knowledge and skills acquired in academic programs by employee students also empower them to take up hi-tech projects including design, construction, quality assurance as well as operation of nuclear facilities. This approach has given India confidence to construct nuclear reactors, as well as entire range of fuel cycle facilities based on indigenous technology.

Indigenous development: Technology control regime is a challenge for development of nuclear technology, and it is necessary to develop complete range of technologies based on indigenous efforts. While nuclear technologies have applications in generation of nuclear power, radioactivity and radiation sources have a great variety of applications that provide immense societal benefits. To realize the full potential of nuclear energy development, research is required in a variety of disciplines, including life sciences, chemical sciences, physical sciences, engineering sciences and medical and health sciences, with emphasis on multidisciplinary research. Mathematics is basic to all branches of sciences and serious research in pure and applied mathematics including theoretical computer science is particularly important for indigenous development of information technologies and for cyber security. It is also necessary to pursue inter-disciplinary scientific studies on environmental, economic, technological and social issues. It is a distinct characteristic of HBNI that its students carry out research in these areas to promote nuclear science and technology.

Basic research: The CIs/OCC of HBNI continue to pursue basic research in frontline areas such as nuclear physics, accelerator physics, laser physics, astrophysics, biophysics, string theory, quantum information and computation, pure and applied mathematics, theoretical computer science, atomic/ molecular clusters, generation and storage of hydrogen, molecular mechanisms of abiotic stress tolerance, development and characterization of transgenic plants, oncology and nuclear medicine, and many other areas including some areas that may be classified as blue sky research. However, these research programs also provide valuable inputs for the indigenous development of nuclear science and technology.

The distinctive characteristics of HBNI described above have translated into a success story, some elements of which are described below:

- A significant percentage of students of the Institute are either employees or potential employees of the CIs. The advent of HBNI has served to enhance research contributions of employees through academic programs.

- Around 70 % of doctoral students of HBNI, as on date, are non-employee students. The knowledge and skills imparted to these students is making a significant contribution to human resource scenario in the country, besides providing DAE young minds to address its research challenges.

- Application of nuclear techniques in health sciences is a success story, especially in the area of diagnosis and treatment of cancer. After the establishment of HBNI, TMC and BARC have increased the number of student intake in this area manyfold, which has benefited the country by increasing availability of specialist doctors in various parts of the country. There is also great demand in medical establishments for students of professional courses run by HBNI, such as, Diploma in Radiological Physics (DipRP) and Diploma in Medical Radio Isotope Technique (DMRIT).
- The publication profile of the University is very impressive in its content and its diversity. Average total number of journal publications is nearly 2500 per year. The h-index of the institute is 112, based on citations of the papers (2014-2019) in Web of Science.

A large number of faculty members have received various awards and recognitions for their work including Academy Fellowships and Civilian Awards.

File Description	Document
Appropriate web in the Institutional website	View Document

5. CONCLUSION

Additional Information :

HBNI is a research university with a unique structure. It has 10 Constituent Institutions (CIs), and one Off-Campus Centre (OCC), all under the umbrella of DAE. These are:

1. Bhabha Atomic Research Centre (BARC), Mumbai
2. Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam
3. Raja Ramanna Centre for Advanced Technology (RRCAT), Indore
4. Variable Energy Cyclotron Centre (VECC), Kolkata.
5. Saha Institute of Nuclear Physics (SINP), Kolkata
6. Institute for Plasma Research (IPR), Gandhinagar
7. Institute of Physics (IoP), Bhubaneswar
8. Harish-Chandra Research Institute (HRI), Allahabad
9. Tata Memorial Centre (TMC), Mumbai
10. Institute of Mathematical Science (IMSc.), Chennai and
11. National Institute for Science Education and Research (NISER), Bhubaneswar (OCC).

The profile of programs and governance system of HBNI are unique in several respects. HBNI educates students at the doctoral and masters level. HBNI is a grant-in-aid institute of DAE and the CIs/OCC of HBNI are either units of DAE or autonomous Grant-in-aid institutes of DAE. Thus, a significant number of faculty are employees of DAE; also, employees constitute a significant fraction of the Ph.D student strength. Government guidelines are followed in all the administrative and financial processes in CIs/OCC; however, in all academic matters, the guidelines and rules of HBNI are followed by all CIs/OCC. Finally, many CIs of HBNI, in line with their mandate, pursue purely basic research, while research in other CIs, particularly the DAE units, has a focus on national mission programs.

A major part of the research output of HBNI is of direct relevance to the nuclear program, and such output leads to in-house incubation of related technologies. The research output has also been raising steadily and has received international acclaim. For instance, “Nature Index 2020” has placed HBNI at the fourth position among all Indian institutions. In the 2020 NIRF ranking, HBNI was placed at the 14th position among the Universities and secured an overall ranking of 30.

Concluding Remarks :

HBNI is a unique university that has imbibed the spirit of DAE with regard to excellence with relevance. Its academic programs are making a significant contribution to the development of indigenous nuclear science and technology capabilities, and societal benefits through its research programs related to cancer care and treatment, and applications of radiation and radioisotopes. Programs at Masters level are making a significant contribution to the pool of scientific man power in the country. HBNI programs are also creating skilled man power of great value to industry and medical profession. The research output from HBNI has earned national and international recognition, as shown by scientometric indicators, and has also significantly contributed to the mission of DAE. By addressing its weaknesses and implementing additional programs, it has the potential to emerge as a unique educational destination for those aspiring to grow into experts in nuclear science/engineering and also in related fundamental sciences.

6.ANNEXURE

1.Metrics Level Deviations

<table>
<tr><td>Metric ID</td><td>Sub Questions and Answers before and after DVV Verification</td></tr>
<tr><td>1.1.3</td><td>Average percentage of courses having focus on employability/ entrepreneurship/ skill development offered by the institution during the last five years

1.1.3.1. Number of courses having focus on employability/ entrepreneurship/ skill development year-wise during the last five years
Answer before DVV Verification:
<table>
<tr><td>2018-19</td><td>2017-18</td><td>2016-17</td><td>2015-16</td><td>2014-15</td></tr>
<tr><td>1145</td><td>1135</td><td>1070</td><td>1063</td><td>1054</td></tr>
</table>
Answer After DVV Verification :
<table>
<tr><td>2018-19</td><td>2017-18</td><td>2016-17</td><td>2015-16</td><td>2014-15</td></tr>
<tr><td>10</td><td>65</td><td>7</td><td>9</td><td>49</td></tr>
</table>
Remark : DVV has reverified no of courses with extended profile metric 3.1 and has made necessary changes based on data excel shared by HEI</td></tr>
<tr><td>2.1.1</td><td>Demand Ratio (Average of last five years)

2.1.1.1. Number of seats available year wise during the last five years
Answer before DVV Verification:
<table>
<tr><td>2018-19</td><td>2017-18</td><td>2016-17</td><td>2015-16</td><td>2014-15</td></tr>
<tr><td>860</td><td>752</td><td>816</td><td>881</td><td>757</td></tr>
</table>
Answer After DVV Verification :
<table>
<tr><td>2018-19</td><td>2017-18</td><td>2016-17</td><td>2015-16</td><td>2014-15</td></tr>
<tr><td>860</td><td>754</td><td>816</td><td>881</td><td>757</td></tr>
</table>
Remark : As per the documents provided by HEI.</td></tr>
<tr><td>2.4.4</td><td>Average percentage of full time teachers who received awards, recognition, fellowships at State, National, International level from Government/Govt. recognised bodies during the last five years

2.4.4.1. Number of full time teachers receiving awards from state /national /international level from Government/Govt. recognized bodies year wise during the last five years
Answer before DVV Verification:
<table>
<tr><td>2018-19</td><td>2017-18</td><td>2016-17</td><td>2015-16</td><td>2014-15</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
</table>

36	33	29	29	23

Answer After DVV Verification :

2018-19	2017-18	2016-17	2015-16	2014-15
34	30	26	29	22

Remark : DVV has excluded NASI-SCOPUS YOUNG SCIENTIST AWARD, Elsevier, Elsevier Netherland from metric

3.7.1 **Number of Collaborative activities for research, Faculty exchange, Student exchange/ internship per year**

3.7.1.1. **Total number of Collaborative activities with other institutions / research establishment / industry for research and academic development of faculty and students year-wise during the last five years.**

Answer before DVV Verification:

2018-19	2017-18	2016-17	2015-16	2014-15
179	153	163	121	80

Answer After DVV Verification :

2018-19	2017-18	2016-17	2015-16	2014-15
176	149	159	121	80

4.1.4 **Average percentage of expenditure for infrastructure augmentation excluding salary during the last five years (INR in Lakhs)**

4.1.4.1. **Expenditure for infrastructure augmentation, excluding salary during the last five years (INR in lakhs)**

Answer before DVV Verification:

2018-19	2017-18	2016-17	2015-16	2014-15
27074	21119	15173	10379	12991

Answer After DVV Verification :

2018-19	2017-18	2016-17	2015-16	2014-15
27074	21119	15173	10379	12991

4.2.4 **Percentage per day usage of library by teachers and students (foot falls and login data for online access) during the last completed academic year**

4.2.4.1. **Number of teachers and students using library per day over last one year**

Answer before DVV Verification : 4249

Answer after DVV Verification: 4212

6.4.3 **Funds / Grants received from non-government bodies, individuals, philanthropists during the last five years (not covered in Criterion III and V) (INR in Lakhs)**

6.4.3.1. Total Grants received from non-government bodies, individuals, Philanthropers year wise during the last five years (INR in Lakhs)

Answer before DVV Verification:

2018-19	2017-18	2016-17	2015-16	2014-15
1728.33	821.73	4882.55	1235.61	929.33

Answer After DVV Verification :

2018-19	2017-18	2016-17	2015-16	2014-15
1729.33	821.74	4882.55	1235.61	929.33

2.Extended Profile Deviations

Extended Profile Deviations
No Deviations