**2.3.2 - Teachers use ICT enabled tools including online resources for effective teaching and learning processes during the year**

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, two videoconferencing facilities exist which have been extensively used in the past year to organise value added courses, webinars, doctoral committee meetings, credit seminars, etc. 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 video graphed by HBNI. The students across the CIs benefit from this resource. Recently, HBNI has also started its YouTube channel, “HBNI Webinar” where all webinars conducted by HBNI stream live. The recordings of webinars are also available on the channel for the benefit of students/faculty across all educational institutions in India.

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 / video recording facilities has been established.