

ORDINANCE PGDEG11

Integrated Ph.D. Programme

1. Admission

- 1.1 Minimum qualification for admission to Integrated Ph.D. program shall be B.E./B.Tech. /B.Sc./ B.V.Sc./ B.Pharm. or equivalent degree from a recognized university or institute with minimum 55% in aggregate or its equivalent grade 'B' in the UGC-7-point scale (or an equivalent grade in a point scale whenever grading system is followed). However, whenever the new stipulation by MHRD/UGC/Statutory Authority is issued, the stipulated criteria shall be followed.
- 1.2 The candidates having B.E./B.Tech. or equivalent degree and having aptitude for research in Science may also be considered for admission to Integrated Ph.D. programme in Sciences.
- 1.3 The Standing Academic Committee (SAC) constituted by the Director of CI/OCC with members recognized as its faculty by HBNI shall select the applicants.
- 1.4 Admission to the IPhD program will be done through one of the following modes of selection
 - i. For DAE employees, admission shall be by interview of the applicants conducted by SAC after being short listed by a written examination approved by Academic Council. Applicants who have PGDSE from HBNI or who have graduated from earlier batches of BARC Training Schools and meeting the academic performance requirement of PGDSE, may be exempted from screening through a written examination. Concerned SAC of the CI/OCC should take a decision in such case based on the past academic credentials of the candidate.
 - ii. Candidates who have been screened through all India national examination and who have appeared in the selection interview of 'Orientation Course for Engineering Graduates and Science Postgraduates' (OCES), may be selected by CI/OCC based on a cut-off interview mark decided by SAC of concerned discipline.
 - iii. For all other candidates, applications may be sought through open advertisements from candidates who have qualified appropriate national level tests conducted by Government bodies, provided the score is valid on the date of application. SAC will conduct interviews of such candidates for admission to IPhD program. CI/OCC may conduct

written tests for such candidates before the interview to further shortlist the names with the approval of Academic Council.

SAC shall make recommendation to HBNI about the admissibility of the candidate into the programme for all the above cases. SAC will also decide about the specific discipline to which the student is to be admitted, in cases of science graduate intending to pursue engineering and vice-versa. SAC shall also make recommendation to HBNI for cases where a science student wishes to pursue Ph.D program in a different science discipline or an engineering student wishes to pursue a Ph.D program in a different engineering discipline.

- 1.5 For each student, SAC will constitute an interim Monitoring Committee (Clause 3) or a Doctoral Committee (Clause 4).
- 1.6 Subsequent to admission in the CI/OCC, each student shall be enrolled in an academic program of HBNI and shall be on the rolls of corresponding Board of Studies.
- 1.7 Integrated PhD program is of two types, viz., Single-Degree and Two-Degrees. Students need to fill an option form regarding their choice of the program at the time of enrolment. The option form once submitted to HBNI and enrolment number is issued will not be changed in general. A student who enters the PhD program in science and opts for Two-Degree program, gets a M.Sc. degree on completion of all academic requirements, as per present ordinances before starting the thesis work for PhD degree. Similarly, a student who enters the PhD program in engineering and opts for Two-Degree program, gets a M.Sc. (Engg) degree on completion of all academic requirements as per present ordinances, before starting the thesis work for PhD degree. Such option of getting a PG degree before starting the thesis work is not available in case a student makes Single-Degree option.

2. Programme

- 2.1 SAC will identify course work to be carried out to meet credit requirements for the admitted candidates. For the science students, a minimum of 120 credits is required for the program, whereas, a minimum of 60 credits is required for the program for engineering students. The students who are from previous batch of training school and completed the program with a minimum of 50% marks in each subject and minimum of 60% aggregate, may be exempted from the requirements of 60 credits. For such students, SAC will take a decision

on the credit requirements based on academic credentials of the student, but not less than 16-credits. Additional credits may be prescribed by SAC for the student who wants to join PhD program in a discipline other than his/her basic discipline. Students may be assigned self-study courses or credit seminars to cater to the subjects which are not covered by the conventional courses. Credits acquired through self-study courses and credit seminars shall not be more than 20% of the total credit requirements. It is desirable to take self-study courses from the courses available in SWAYAM, NPTEL or other similar portals. Students need to pass an additional course on Research Methodology.

- 2.2 In case of two-degree option, the science students will carry out M.Sc. project work in the second year after successful completion of the course work. The normal period of completion of course work and thesis work for M.Sc. degree is two years. Extension may be given based on the recommendation of the monitoring/doctoral committee.
- 2.3 Similarly, in case of two-degree option, engineering students will carry out M.Sc. (Engg) project work in the second year after successful completion of the course work. The normal period of completion of course work and thesis work for M.Sc.(Engg) degree is two and a half years. Extension may be given based on the recommendation of the monitoring/doctoral committee.
- 2.4 In case of self-study course, a faculty member will be identified for each self-study course, who will help the student during the period of learning. The faculty member will also conduct written examinations from time-to-time and submit the marksheet at the end of the course to Monitoring/Doctoral Committee. After the acceptance by Monitoring/Doctoral Committee, the marksheet will be issued to the student and a copy will be sent to HBNI central office for record. A minimum of 50% marks is required for the successful completion of the course. Only one reexamination is permitted. In case of failure in the reexamination, the case shall be referred back to SAC, which may decide about the continuation of the enrolment of the student or permit additional chance for reexamination or any other alternative deemed fit.
- 2.5 Monitoring/Doctoral Committee will identify the subject of the credit seminar along with the topics to be covered. Guide will provide necessary academic support to the student during the preparation of the seminar. Student will deliver the seminar in a Monitoring/Doctoral Committee meeting and will answer the questions asked by the members. Monitoring/Doctoral Committee will then take a decision regarding successful completion of the seminar. If not satisfied,

Monitoring/Doctoral Committee may ask the student to repeat the seminar. A maximum of two attempts is permitted. In case of failure in the second attempt, the case shall be referred back to SAC, which may decide about the continuation of the enrolment of the student or permit additional chance for reexamination or any other alternative deemed fit.

- 2.6 A candidate shall appear for an Oral General Comprehensive Examination (OGCE) to be conducted by the Monitoring/Doctoral Committee after the successful completion of credit requirements in case of single-degree option or after acquiring M.Sc./ M.Sc.(Engg) degrees in case of two-degree option. Physical participation of the student in OGCE is mandatory. In addition to this, participation of Doctoral/Monitoring Committee Chairman, Guide (if appointed) and two members is mandatory. One of them can participate by means of video. The scope of OGCE will include the topics related to the domain of research as well as the courses undergone by the student relevant to the proposed research area. The doctoral/ monitoring committee will inform the student in advance about the scope of OGCE.
- 2.7 If performance of the student in OGCE is satisfactory, the Monitoring/Doctoral Committee shall permit the candidate to pursue research programs leading to PhD thesis. Else, it may give specific suggestions and time period (maximum six months) to the candidate for preparation before reappearing for the oral general comprehensive examination. If a candidate fails to qualify in two attempts, his/her enrolment for Ph.D. shall be cancelled. All the prescribed course work, credit seminars, self-study courses and oral general comprehensive examination should be completed within 2 years of enrolment in case of single-degree program or within 6 months of completion of the first degree in case of two-degree program. This period can be extended, with the permission of Dean (Academic) by a maximum period of six months. The student shall submit a compliance report, in the prescribed format, to the office of HBNI on the completion of OGCE. Non-compliance of the OGCE requirement within the stipulated period may lead to cancellation of enrolment.
- 2.8 The SAC by taking into consideration aspects like the aptitude, work experience, courses studied and the interest of the student, may facilitate the student in identifying a topic of research and a guide and, if necessary, a co-guide. The guide and, where applicable, co-guide can be also from another CI/OCC of HBNI. The co-guide can be also from an Institution or University with which HBNI has agreement of

cooperation. To encourage inter-disciplinary research, a candidate may have two guides. To get guidance on issues related to technology, a student may have a Technology Adviser. A Technology Adviser will be an individual who has demonstrated abilities in technology development or engineering design in areas related with the research topic of the student.

- 2.9 The process of identifying a topic of research, Guide and Doctoral Committee may be completed by SAC at the time of admission. For other students, this may be done during or after the successful completion of the course work. In any case, the CI/OCC must ensure that a guide, research topic and doctoral committee are identified as soon as the candidate qualifies the Oral General Comprehensive Examination.
- 2.10 The normal period of completion of research and submission of thesis shall be six-years for single-degree programs and seven-years in case of two-degree option. In case of two-degree option, the first-degree program needs to be completed within the normal period applicable to that degree. If the first degree is not completed within the stipulated period, a time extension may be granted based on the recommendation of the Dean(Academic). However, such extension shall not increase the normal period of completion of the two-degree academic program.
- 2.11 Any extension beyond normal period will need recommendation of the Doctoral Committee. Extension beyond seven years in the case of single-degree programs and eight years in the case of dual degree programs will additionally require recommendation of the concerned Board of Studies. Suitable relaxation may be provided to women/differently abled candidates. Recommendation of the Doctoral Committee/Board of Studies shall be put up to competent authority at HBNI for approval.
- 2.12 Enrolment will normally be cancelled at the end of eight years for the single-degree programs and nine years for the dual degree programs. In exceptional cases, based on adequate justification and recommendation of the Director of the CI/OCC, one time extension beyond second extension for a limited period may be considered by competent authorities of HBNI.
- 2.13 In case the enrolment is terminated, a new enrolment in the same academic program shall be considered only after a minimum period of two years from the date of termination. This may be relaxed in exceptional cases based on the recommendation of the Director of the CI.

- 2.14 In case of single-degree program, the minimum period of residency is three and a half years and minimum period for submission of thesis shall be four years from the date of enrolment. However, in case of two-degree program, the minimum period of residency is four and a half years and minimum period for submission of thesis shall be five years from the date of enrolment.
- 2.15 The student shall prepare, in consultation with his/her guide, a plan of research work based on the topic of research approved by SAC. The Doctoral Committee shall meet as soon as the student is prepared to make a presentation on his/her plan of research. In this meeting, the Committee may prescribe additional courses to be taken up by the student.
- 2.16 During the course of his/her thesis work, the Doctoral Committee will conduct periodic reviews on the progress of the work based on annual progress report to be submitted by the student. During the review, the student should make a presentation. Physical participation of the student during annual review is mandatory. In addition to this, participation of Doctoral/Monitoring Committee Chairman, Guide (if appointed) and one member is mandatory. The committee shall monitor the progress and advise the candidate as appropriate including permission to appear in pre-synopsis seminar. In case of repeated poor performance, Doctoral Committee shall suggest cancellation of enrolment to HBNI. The annual progress report along with the review report shall be forwarded to Dean, HBNI through Dean (Academic) of the CI/OCC as per academic calendar.
- 2.17 The pre-synopsis seminar shall be open to all. Physical participation of the student in pre-synopsis seminar is mandatory. In addition to this, participation of Doctoral Committee Chairman, Guide and two members is mandatory. One of them can participate by means of video. During the seminar, student will make a presentation of entire research work and chapter wise content of the thesis including list of publications. In case Doctoral Committee is satisfied with the quality as well as quantity of the research work, it can permit the student to submit the synopsis within two weeks' time.
- 2.18 Doctoral Committee will also forward names of minimum six and maximum eight reviewers to Dean (Academic) in a sealed envelope. These names should not be revealed to the student.
- 2.19 All reviewers should be renowned academicians/researchers in the subject of the thesis. They should not be staff member of the CI/OCC. It is desirable to have at least three foreign reviewers in the suggested list

forwarded by Doctoral Committee. Not more than one reviewer shall be from the state in which CI/OCC is located.

- 2.20 Some students get employment offers even before they complete the academic program. A research student is normally expected to remain on the campus of the CI/OCC until the thesis is submitted. However, in special circumstances, such residency requirement of entire period may be relaxed to facilitate the student to take up the employment, if the student has completed course work, passed OGCE, finished all experimental work and also completed a substantial part of the theoretical work. Such a provision will be available to only those students, who have completed the minimum residency period as per clause 2.14. The student shall submit a written request to the thesis supervisor, enclosing a letter of concurrence from the employer to continue with the PhD program in HBNI. If the thesis supervisor is satisfied that the student can complete the remaining work and write the thesis even when he/she is not residing on the campus, he may forward the request to HBNI through the Dean (Academic) with a specific recommendation. The student is expected to submit the thesis within the approved tenure. Further extension of academic program will not be granted for such students.

3. Monitoring Committee

- 3.1 Progress of each student shall be monitored by a Monitoring Committee to be constituted by the SAC at the time of admission. However, as soon as the research topic and the guide are identified, a Doctoral Committee (see clause 4 below) shall be formed to replace the Monitoring Committee. The composition of the Monitoring Committee shall be as follows:
- a. A senior faculty member of HBNI shall be the Convener,
 - b. Up to two faculty members who are experts in an area falling in the domain of the Board of Studies to which the student is enrolled,
 - c. Up to two members from the faculty involved in teaching the courses that the student is attending.
- 3.2 The Committee will mentor the student and evaluate his/her performance until such time as a Doctoral Committee is constituted.

4. Doctoral Committee

- 4.1 To monitor the progress of the students, SAC will suggest composition of Doctoral Committee for each student as soon as guide and research topic are identified. The recommendation of the SAC shall be

communicated to Central Office for approval by filling appropriate part of the enrolment forms. The composition of each committee shall be as follows:

- a. A Professor or an Associate Professor shall be the Chairman of the Committee,
 - b. The guide shall be the Convener, and, where applicable, the co-guide shall be a co-convener.
 - c. Two faculty members of the Institute specializing in a domain encompassing the topic of research,
 - d. One faculty member preferably from any other CI or any other university/ academic institute in an allied domain as the topic of research,
 - e. A Technology Adviser, if any, shall be a permanent invitee.
- 4.2 The Committee will mentor the student and evaluate his/her performance through periodic reviews, at least once in a year, until the submission of the thesis. All such review reports along with the recommendation of the Doctoral Committee shall be forwarded to Dean, HBNI for necessary action.
- 4.3 Any proposal for change in the constitution of doctoral committee, guide or topic of research shall be forwarded through SAC for approval from HBNI central office. Such approval should be obtained before the ensuing annual progress review.

5. Award of Degree

- 5.1 The thesis examiners will be appointed as per the procedure detailed below.
- a. The Dean (Academic) of a CI/OCC will forward the synopsis, list of publications and suggested list of reviewers following clause 2.18 and 2.19, to the Convener, Board of Studies (BOS). In parallel, Dean (Academic) will also forward the synopsis, list of publications including copy of first page of relevant publications, suggested names of reviewers and receipt for payment of thesis evaluation fee to HBNI Central Office. It is expected that the Dean (Academic) will exclude any suggested reviewer from the list who has already served as reviewer for another HBNI PhD thesis in the previous one-year period.
 - b. The Convener BOS, in consultation with the BOS members will evaluate the synopsis for its adequacy for awarding the degree. In

addition to this, BOS will also shortlist minimum four and maximum six reviewers, who may or may not be from the list suggested by the Doctoral Committee. The Convener, BOS then will forward their decision on the adequacy of the research work and shortlisted names of reviewers to Dean, HBNI.

- c. In case of non-adequacy of research work, Dean HBNI will communicate the same to the Dean (Academic) for further action at CI level.
- d. In case the synopsis is approved by BOS, HBNI will communicate the list of four examiners as prioritized by Vice Chancellor to Dean (Academic) to start the review process. The names in the list may or may not be from the list recommended by the Board of Studies.
- e. In case of clarifications, if any, Dean, HBNI will get back to Convener, BOS. After the clarification, procedure at Sr. No. 'b' will be repeated.

5.2 The student shall submit to the Dean (Academic) `soft` as well as the requisite number (to be specified by the Dean (Academic)) of `hard` copies of the thesis within three months from the date of the pre-synopsis seminar. This time limit may be relaxed by the Dean (Academic) in deserving cases. However, in case of a delay beyond six months, the Dean (Academic) shall refer the case back to the doctoral committee for repeating the pre-synopsis seminar once the thesis is in final shape. The doctoral committee shall conduct the pre-synopsis seminar and forward the report along with the thesis to Dean (Academic) for further processing.

5.3 The Dean (Academic) shall follow the following review procedure after receiving prioritized list from HBNI.

- a) Two or more prioritized reviewers will be approached concurrently for obtaining concurrence with a request to send the concurrence within a week. While writing to the reviewers for obtaining concurrence it will be made clear that University would ultimately decide about the reviewers to whom the thesis will be forwarded.
- b) Among the reviewers who agree, the thesis shall be forwarded to the first two in the order of priority indicating a period not more than six weeks to complete the review process. The thesis may be forwarded to third reviewer as well concurrently, who has sent the concurrence.
- c) In case only one reviewer indicates his concurrence, the thesis will be forwarded to him for review comments. Meanwhile, Dean (Academic) shall contact HBNI Central Office to obtain names of additional

reviewers and continue with the review process after getting the new names.

- d) After a period of six weeks of forwarding the thesis, a decision will be taken as per following clauses for processing the thesis based on number of review reports received.
 - e) The Dean (Academic) shall also ensure that each reviewer's report concludes with specific recommendations regarding the acceptance of the thesis as per HBNI format.
- 5.4 The examiners are expected to submit their report within six weeks of the date of receipt of the thesis. A reminder may be sent to all reviewers at appropriate time. In case, review comments have been received from all the three reviewers within six weeks, all will be considered for thesis evaluation. However, beyond six weeks, comments from any two-reviewers received first will be considered for thesis evaluation. In that case, Dean (Academic) will communicate to the third reviewer appropriately as soon as reports from two reviewers have been received.
- 5.5 In case of undue delay in receiving comments at least from two reviewers or in case of rejection from one of the two reviewers, Dean (Academic) may approach the person next on the list of reviewers.
- 5.6 In case comments from three reviewers are available:
- a. In case the thesis is accepted by two reviewers in its present form or with minor revisions (i.e. option '1' or option '2' of PhD thesis evaluation report), Dean (Academic) will send the comments to Guide and the student can proceed with the final viva-voce examination after revising thesis based on the comments.
 - b. In case the thesis is rejected by two reviewers (i.e. option '4' of PhD thesis evaluation report), the enrolment of the student shall be cancelled.
 - c. In case reviewer(s) suggest revisions (option '3' of PhD thesis evaluation report), the suggested revisions shall be communicated to the student through guide and, after having been duly revised, the thesis shall be re-sent to the reviewers for revised review reports.
 - d. In case the thesis is not found acceptable by two reviewers even after revisions are made, the enrolment of the student shall be cancelled.
- 5.7 In case comments from two reviewers are available:
- a. In case the thesis is accepted by both reviewers (i.e. option '1' or option '2' of PhD thesis evaluation report) in its present form or with minor revisions, Dean (Academic) will send the comments to Guide and the student can proceed with the final oral examination after revising thesis based on the comments.

- b. In case the thesis is rejected by both the reviewers (i.e. option '4' of PhD thesis evaluation report), the enrolment of the student shall be cancelled.
- c. In case reviewer(s) suggest revisions (i.e. option '3' of PhD thesis evaluation report), the suggested revisions shall be communicated to the student and, after having been duly revised, the thesis shall be re-sent to the reviewers for revised review reports.
- d. In case the thesis is not found acceptable by both reviewers even after revisions are made, the enrolment of the student shall be cancelled.
- e. If report of only one of the examiners is negative (i.e. option '4' of PhD thesis evaluation report), then the student should thoroughly modify the thesis taking into consideration all the issues raised by the reviewer. Dean (Academic) will then get it reviewed by the next reviewer from the prioritized list.
- f. If the third examiner also declares that the thesis is not acceptable for award of the degree, the enrolment of the student shall be cancelled.

5.8 Notwithstanding clauses 5.6/5.7 and option indicated by the reviewer, in case any reviewer has made adverse remarks about the content of the thesis, Dean (Academic) shall refer the case to the Central Office for advice before taking any further action.

5.9 In case the thesis is accepted for award of the degree, each student must defend his/her thesis at an open oral examination as a requirement in partial fulfillment of the PhD degree. One of the Thesis reviewers, as decided by Dean (Academic), shall be external examiner of the viva-voce Board. The Doctoral Committee responsible for conducting pre-synopsis seminar along with the external examiner as a member shall act as the viva-voce board and conduct the viva-voce examination. The viva-voce shall be conducted as soon as possible after giving at least two weeks of open notice. The members must receive the thesis along with comments from the reviewers at least seven working days before the scheduled oral examination. The Committee can ask for more than seven working days, if it deems reasonable or appropriate.

5.10 *Physical participation* of the student is mandatory. In addition to this, *participation* of Chairman, Guide, External Examiner and two members in the final viva-voce examination is mandatory. One of them can participate by means of video.

5.11 All members of the board who participated in the examination (either physically or by means of video) are required to affix their signatures with

names and date on the recommendation sheet of the board. In case any member is absent (neither participated physically nor by means of video), he/she must also sign the Report of the Examining Committee with a declaration that 'I was absent during the viva-voce examination. I have gone through the thesis and agree with the decision of the Doctoral Committee'. In case of difficulty to meet the quorum, concerned Dean-Academic of CI or Associate Dean (HBNI) can attend the meeting to form the quorum.

- 5.12 The viva-voce examination will be open to all. The student will make a presentation. The members of the committee will ask questions and seek clarifications, if any. Student will also respond to questions raised by reviewers and also from the audience.
- 5.13 The board will then hold discussion to decide about successful defense of the thesis and suitability of the candidate for award of the degree. It has the following options.
 - a. To accept the thesis without any recommended changes and recommend award of the degree.
 - b. To recommend revisions to the thesis. The student shall make all the changes suggested, get the revised thesis duly certified by the guide and submit the same for the approval of the board. The board members recommend award of the degree, if they are satisfied with the revised thesis.
 - c. To rule the thesis (including the examination) unsatisfactory. In that circumstance, the student fails.
 - d. The report of the board will be signed by all the members with names and date.
- 5.14 Following the examination, the Chair must inform the student of the outcome of the examination indicating which of the above alternatives has been adopted.
- 5.15 The student passes if all members of the board accept the thesis (including its examination) as satisfactory. One or more negative votes constitute a failure of the candidate to meet the requirement. In case of failure, the board must specify in detail and in writing the nature of deficiencies in the thesis and/or the oral examination that led to the failure. A second examination may be permitted and this should be held within six months. If the student fails in the second examination or if the second examination is not permitted, the student's enrolment is terminated.

- 5.16 The report of the board signed by all members must reach the office of Dean, HBNI through Dean (Academic) of the CI/OCC for the award of the degree.