

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

RULES AND REGULATIONS

Ph.D. Programme



Academic Office

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Ph.D. Programme

As a result of the sound research base and extensive infrastructural facilities available, the Institute offers Ph.D. Programme in a wide range of areas in Engineering, Science, Design and Humanities & Social Sciences. The broad objectives of the Ph.D. programme is not only to keep pace with the expanding frontiers of knowledge but also to provide research training relevant to the present social and economic objectives of the country.

The academic programme leading to the Ph.D. degree is broad-based and involves a minimum course credit requirement and a research thesis. The institute also encourages research in interdisciplinary areas through a system of joint supervision and interdepartmental group activities. The presence of a strong research oriented faculty provides excellent opportunities for such programmes. The Institute undertakes sponsored research and development projects from industrial and other organization in the public as well as private sector.

Facilities for research work leading to the Ph.D. Degree are available in the all Science, Engineering, Design and Humanities & Social Sciences departments. In addition to the facilities available in the laboratories and Workshops of his/her own department, a Ph.D. scholar has access to the central facilities available elsewhere also in the Institute. Several departmental and Institute-level seminars are held throughout the year. A large number of distinguished scientists and engineers both from India and abroad, visit the Institute to deliver lectures and hold discussions with the research groups. The Ph.D. students thus get ample opportunities to pursue their research programmes in a truly stimulating environment.

Ph.D. Rules and Regulations:-

Ordinances

The Ordinances of the Institute shall take precedence over the Rules in matter of any dispute.

O.D. 1 :

- a) A student will be considered by the Senate to be eligible for registration for the degree of Doctor of Philosophy on his/her making an application in the prescribed form provided he/she has obtained M.Tech. degree of this Institute or an equivalent qualification by virtue of an examination.
- b) A student who possesses an M.Tech./M.Phil. degree or equivalent qualification is not ipso facto eligible for registration but shall be required to fulfill the minimum credit requirement under an approved programme of studies.

O.D. 2 :

- a) The Degree of Doctor of Philosophy may be conferred on a student subject to the following conditions :
 - i) Research work has been carried out at the Institute under the guidance of Supervisor(s) for **at least two years in the case of all students** (except external students) and **three years in the case of external students after their date of registration** on a topic duly approved by the Senate.
 - ii) The thesis submitted by the student required to be recommended for the award of the Ph.D. degree by two external referees and by the Board of Examiners constituted for the viva-voce examination.
- b) Notwithstanding the provision of O.D.2 (a), a student registered for the degree of Doctor of Philosophy may be permitted to carry out part or whole of his/her research work outside the Institute in a factory, laboratory, workshop, worksite or other research centres duly approved for the purpose by the Institute.

O.D.3 :

The degree of Doctor of Philosophy shall not be conferred as an ad eundem degree.

O.D.4 :

Notwithstanding the provisions of O.D.1, the Senate will consider the registration for the degree of Doctor of Philosophy of a student who has obtained the B.Tech./M.Sc./M.A. degree or an equivalent qualification by virtue of an examination in a subject duly approved by the Senate, and has successfully completed the minimum prescribed credit requirements under an approved programme of studies.

O.D.5 :

Institute Faculty, Research Assistant, Technical Assistants or any other duly approved category of Institute Staff may be registered for the degree of Doctor of Philosophy under the provisions of O.D1 and O.D.4.

Rules and Regulations :

The Institute offers facilities for work leading to the degree of Doctor of Philosophy (Ph.D.) in various departmental and Interdisciplinary research areas. Extracts of the Rules and Regulations governing the Ph.D. programme are given below:

1. Admission :

R. 1.1 : (Amended as resolved in 141st meeting of the Senate held on 11.3.98)

Student Status : The Status of the students admitted to the Ph.D. programme shall be classified under any one of the following categories :

1. Full-time Research Scholar :

a) Institute Research Scholars (Teaching Assistant)

- b) Govt./Semi Govt. Fellowship Awardees
(QIP, CSIR, UGC, DAE, DST, DBT, NBHM, etc)
- c) Sponsored candidates (SW)
- d) Self-financed (Indian/Foreign/Study Leave) (SF)
- e) Indian Council for Cultural Research Awardees (Foreign Students)

2. Part-time Research Scholar :

- f) Institute Faculty/Staff (IS)
- g) Project Staff (PS)
- h) Research Assistants (RA)
- i) External candidates (Sponsored) (EX)
- j) College Teacher (Self-financed) (CT)
(Candidates from Colleges/Educational Institutes carrying out Research work during week-ends, holidays and vacations at IIT Bombay)

a) Institute Research Scholars (Teaching Assistant (TA) :

Institute Research Scholars are considered for Teaching Assistantship.

**b) Govt./Semi Govt. Fellowship Awardees
(QIP, CSIR, UGC, DAE, DST, DBT, NBHM, etc.)**

These candidates are considered for financial support from Govt./Semi Govt. schemes. The admission procedure and other requirements are same as applicable to Institute Research Scholars.

c) Sponsored Candidates (SW):

These candidates are sponsored by recognized R&D organization for doing research work in the Institute on full time basis. Candidates are expected to be released for full time research work at the Institute for a minimum period of three years. They will not receive any financial support from the Institute.

d) Self Financed (Indian/Foreign)/Study Leave (SF):

- 1) Indian: This category refers to persons with experience and with good track record to join the doctoral programme. They are admitted along with the regular research students through the usual admission procedure but they would not get any financial support from the Institute.
- 2) Foreign: These students are admitted through Embassy of the respective Govts. after getting approval from the Ministry of External Affairs and no objection certificate from the Ministry of Human Resources Development, Department of Education, Govt. of India.
- 3) Study Leave: This category refers to candidates who are released from governmental or educational institutions on study leave for a period of not less than three years for doing research work at the Institute.

e) College Teacher (CT):

- i) The Institute will decide the competence of the candidates along with the regular candidates at the time of the admission.
- ii) No objection certificate from the college as well as a letter from the university stating that the university has no objection to IIT Bombay awarding the Ph.D. degree.
- iii) Place of work is IIT Bombay even though he/she may be carrying out part of work in his/her College/Institution.
- iv) External supervisor is optional based on the recommendations from the supervisor/s and DPGC/IDPC/PGC of the respective department/ID Group/centre/school.
- v) Candidates should be available to the supervisor during weekends, holidays and vacations.
- vi) The fee structure for these candidates will be as applicable to self-financing Candidates.

- vii) Hostel accommodation will not be provided during the regular semester except during the first semester. However, they may be permitted to stay in the hostels during the vacation on payment of guest charges as per hostel rules.
- viii) Rules for evaluation of Academic Performance of these candidates will be the same as applicable to other categories.

f) ICCR Awardees (Foreign Nationals) (FN):

These students are sponsored by their Governments and awarded scholarship by Govt. of India, ICCR. They should apply for admission through Indian Embassy in their country.

g) Institute Faculty/Staff (IS):

This category refers to candidates who are permanent employees of the Institute with more than 2 years of services are admitted to the Ph.D. Programme. They are expected to work for their Ph.D. Programme after fulfilling their normal duties.

h) Project Staff (PS):

This category refers to candidates who are working on various Projects undertaken by the Institute and admitted to the Ph.D. programme, if the duration of the Project at the time of admission is around 3 years. They are expected to work for their Ph.D. Programme after fulfilling their normal duties.

i) Research Assistantship (RA):

Depending upon the requirements, each Department/Centre/School may induct one Research Assistant every year.

- i) Students who have valid GATE/UGC/CSIR/NBHM, etc. score will be considered for Assistantship.
- ii) These Research Assistants have to look after the laboratories and also assist in teaching or research or other work assigned by the Head of the Department/Centre/School or Convener, IDPC.

iii) They are required to work for about 16-20 hours a week. **They have to complete the Ph.D. Programme in five/six years**, depending on their qualifying degrees.

j) External candidates (Sponsored) (EX):

After fulfilling one/two semester(s) residential requirement at the Institute, these candidates will be allowed to register for Ph.D. with a supervisor from the Institute (Internal) and other from their parent organization (External) where they will be doing the research work. They shall produce sponsorship certificate from the parent organization along with the application for admission.

R.1.2 :

- a) If a student leaves the programme any time within the first two years without prior permissions of the Senate, he will lose his/her student status.
- b) If a student withdraws from his/her Ph.D. programme any time without intimation (within the first two years) after admission, his/her student status ceases and he/she would not be readmitted with any weightage for the credits acquired the period of stay.
- c) In case a student wishes to temporarily withdraw from his/her Ph.D. programme he/she may do so only after a period of two years following his/her date of registration with prior permission of the Senate.
- d) Research scholar, if recommended by DPGC/IDPC, recognised by PGPC and approved by Senate, may be allowed to change his/her status to "external student" earlier than 2 years if,
 - (i) he/she has completed all courses.
 - (ii) He/she gets sponsorship certificate from the organization (recognised by PGPC) he/she joins and
 - (iii) He/she is able to get a suitable local supervisor to act as guide in broad area of research approved by the DPGC/IDPC. The student is

required to complete all the formalities regarding status change within one year of leaving the Institute.

2. Eligibility for Admission

R.2.1. : Minimum Qualification for Admission

One of the following in appropriate areas:

- 1) First Class or Equivalent Master's Degree in Engineering/Technology.
- 2) A First class Master's degree in Science (55% for SC/ST) or a first class in Bachelor's degree in Engineering/Technology (55% for SC/ST) and a valid GATE score or an award of a CSIR/UGC/NBHM/DBT Research fellowship.
- 3) **Candidates not having a valid GATE score** or not having CSIR/UGC/NBHM/DBT award can be considered for admission to the Ph.D. programme if they have minimum of 2 years of professional work experience. **However, they will not be considered for Teaching/Research Assistantship.**

4) Humanities & Social Sciences:

First Class or 60% marks (55% for SC/ST) in:

- i) M.A./M.Com. or equivalent degree
- ii) Master's degree in Science/Graduate Degree in Engineering/Technology with 60% marks (or equivalent grade) (55% for SC/ST) may be considered for research areas consistent with the academic background and special interests.
- iii) M.Phil. degree in any of the five disciplines (pertaining to the research areas listed below) or in any allied subjects or in "Humanities and Social Sciences with specialization in Planning and Development" awarded by IIT Bombay with minimum 55% marks (50% for SC/ST) at the master's degree level or equivalent letter grade.

6) SJM School of Management:

- i) B.E./B.Tech. or equivalent with first class (55% for SC/ST) and minimum of 2 years of relevant work experience. M.E./M.Tech. or equivalent degree with first class at graduation and post graduation level (55% for SC/ST).
- ii) Master of Management/M.B.A. or equivalent with first class at graduation and post graduation levels (55% for SC/ST).
- iii) M.Sc./M.A./M.Com./LLM/MCA or equivalent with first class at graduation and post graduation levels (55% for SC/ST) and 2 years of relevant work experience.

7) School of Biosciences & Bioengineering:

- i) M.Tech/M.E. or first class/division in B.Tech/B.E. in Biomedical, Chemical, Computer Science, Electrical, Electronics, Telecommunications, Instrumentation, Mechanical Engineering and Engineering Physics.
- ii) First class/division in M.Sc. or equivalent in Biochemistry, Biophysics, Biotechnology, ceramics, Chemistry, Electronics. Ergonomics, Material Science, Mathematics, Molecular Biology, Physics and Physiology
- iii) First class/division in MBBS degree in occupational Physiotherapy, with AIIMS (PG Entrance Test)/MCI entrance examination for MD/MS (for Medical graduate)/MBBS with MD/MS
- iv) M.Pharm.
- v) M.V.Sc. and M.D.S.

8) Industrial Design Centre (Ph.D. Programme in Design):

First Class or 60% marks (55% for SC/ST) in:

M.Des./M.Arch./M.Tech./M.Phil./MFA/Post-Graduate Diploma in Design of NID and equivalent **OR** B.Des./B.Arch./BFA/MA/M.Sc./Under-Graduate Diploma in Design of NID **OR** equivalent degree with exceptionally outstanding design related work with a valid CEED score. Candidates with a minimum of three years of relevant professional experience without CEED scores can also be considered. However, such candidates will not be awarded Teaching/Research Assistantship.

Each Department/School/Centre/Interdisciplinary groups has additional eligibility requirements, which are given in text under each department of Ph.D. information brochure.

R.2.2 : Change from M.Tech. to Ph.D.

- a) If a particular student who is pursuing full time M.Tech. Programme at the Institute and is fulfilling the minimum qualifications prescribed for admission to any specific Ph.D. programme of the Institute wishes to change over to that of Ph.D. Programme, he/she may be permitted to do so provided he/she has obtained an SPI of 9.00 or above after having registered for 38 credits of course work in the first semester (See MR 2.1.2 and MR 2.1.3).

Note:

The student(s) shall apply for the change over by the end of the first semester through the DPGCs/IDPCs/PGCs, will forward the applications with its recommendation to the PGAPEC for consideration.

b) Award of M.Phil. Degree to the Ph.D. students from Science Stream

A student who has earned 34 credits of Ph.D. Programme may be permitted to register for the M.Phil. Programme. This is permitted in the Departments of Physics, Chemistry, Mathematics, Earth Sciences, Biotechnology and Humanities & Social Sciences. To obtain an M.Phil. Degree the student successfully complete one year project work leading to dissertation.

c) Award of M.S. by Research to the Ph.D. students from Engineering Stream

A student pursuing the Ph.D. Programme in Engineering discipline and who has successfully completed 22-34 credits of course work (22 for students with M.Tech. qualification and 34 for students with B.Tech./B.E. qualification) may be permitted to register for the M.S. Programme by Research leading to dissertation. The total duration of M.S. Programme will be 2-3 years.

(Ref. 136th Meeting of the Senate held on 24-11-1996)

R.2.3: The following procedure is to be followed for change from **one programme to another** (Ref. 141st Meeting of the Senate held on 11-3-1998):

- i) These Transfers will be considered on case-to-case basis.

- ii) Request for a change of PG programme should come from the student and should be endorsed by Supervisor/RPC.
- iii) The application for consideration of admission to another PG programme should be routed through the Postgraduate Committee of the Dept./Group/Centre/ School.
- iv) The candidates should satisfy all the academic requirements for the award of the degree for which he is being considered.
- v) DPGC/IDPC/PGC may recommend the time limits for submission of Dissertation/Thesis, if required.
- vi) The request will then be considered by PGAPEC and subsequent approval by Senate.

3. Pattern of Courses and Credits

The courses offered for the Ph.D. Programmes may be Lecture Courses, Laboratory Courses, Design Courses and Seminars, Communication skills.

R.3.1 :

The credit for a course depends upon the contact hours and self-study hours associated with it and is obtained by adding all these hours. The credits for all the available courses are indicated in the courses of Study Bulletin.

R.3.2:

Seminar shall satisfy the following conditions:

- a) Each seminar shall carry four credits.
- b) Seminar shall be treated as a course for the purpose of registration and evaluation.

- c) Seminar co-ordinator appointed by the DPGCs/IDPCs/PGCs shall arrange the seminars and forward the grades awarded by the panels of examiners to the Academic Office by the end of the semester.
- d) A student shall not take more than two Seminars during the entire Ph.D. Programme.

R.3.3 Communication Skill course (PP/NP course) – ref. 165th meeting of the Senate

- a) This course is compulsory for all Ph.D. students.
- b) Ph.D. students are required to clear Communication Skill course within first two semesters.
- c) This course is an addition to the minimum course credit requirement prescribed by the DPGCs/IDPCs.
- d) Students having qualifying degree from IIT and having cleared 'Communication Skill' during their M.Tech. Programme are exempted from this requirement.

4. Course Credit requirements and Registration for courses

All students for Ph.D. programme are required to acquire prescribed credits through course work, which shall normally be completed.

- a) Within one semester from the date of joining by the students having M.Tech. or equivalent qualification and
- b) Within first two semesters from the date of joining by the students having B.Tech./M.S./M.A./equivalent qualification.

Ph.D. students will be allowed to complete extra credit courses, if necessary (ref. 168th meeting of the Senate)

R.4.1 : (Applicable to students with M.Tech. or equivalent degree)
(amended as resolved in 136th Senate meeting held on 27.11.96)

- a) The credit requirements for students **having M.Tech./M.Phil. or equivalent qualification, will be a minimum of 16 credits i.e. 2 courses and a**

seminar and maximum of 22 credits. The courses may be taken from those offered by other Departments/ Interdisciplinary Groups.

- b) The students may earn upto a maximum of 4 credits through seminars.
- c) Students with M.Tech. degree who have been admitted to the Ph.D. Programme should also undergo at least two courses at the M.Tech./ Ph.D. level in addition to the Seminar requirements.

R.4.2 : (Applicable to students with M.Sc./M.A. or equivalent degree and admitted to Ph.D. programme in Science discipline).

- a) The credits requirements for students having **M.Sc./M.A. or equivalent qualification admitted to Science Department shall be 34 to 46 credits.**
- b) **Credits acquired through PG level courses shall be 24 or more** (minimum 4 courses).
- c) The students may earn up to a **maximum of 8 credits through Seminars**, which should be spread over two semesters.

R.4.3. : (Applicable to students with B.Tech. or equivalent degree and M.Sc. or equivalent degree admitted to Ph.D. programme in Engineering discipline).

- a) The **credits requirements for students having B.Tech. or equivalent qualification shall be 44 to 56 credits.** The same number of credits should also be earned by students with M.Sc. degrees of equivalent qualifications admitted to Ph.D. programme in any one of the Engineering disciplines.
- b) The students may earn up to a maximum of 8 credits through Seminars, which should be spread over two semesters.
- c) The students may also register for a R&D project to complete credits.
- d) **Credits acquired through PG level courses shall be 30 or more.** (minimum 5 courses)

R.4.4.1 : (Applicable to students of Biomedical Engineering)

a) Students with B.Tech./MBBS/M.Sc. or equivalent

I semester - 40 credits (36 credits of courses - 1 Seminar)

II semester - 22 credits (18 credits of courses - 1 Seminar)

b) Students with M.Tech. in Biomedical Engineering.

I semester - 22 credits (18 credits of courses - 1 Seminar)

c) Students with other M.Tech. degree (or equivalent)

I semester - 34 credits (30 credits of courses - 1 Seminar)

R.4.4.2 : (Applicable to School of Management)

(Amended as resolved in 186th Senate meeting held on 19.10.07)

The course requirement for students entering with an M.Mgt. or an equivalent degree should be minimum of 40 credits and maximum of 64 credits. For all other students the course requirement to vary between 52 to 64 credits.

Candidates who register for minimum credits should complete them within two semesters as per rule, whereas students who have been assigned course credit requirements more than minimum, may be considered by the PGC of the School and recommended appropriately for approval of the PGAPEC. However, total period admissible for completing programme will remain unchanged in all cases.

R.4.4.3 : (Applicable to Kanwal Rekhi School of Information Technology)

a) Students with B.E./B.Tech./M.Sc./MCA degree - 44 to 60 credits.

b) Students with M.Tech. or equivalent degree - 16 to 44 credits.

R.4.4.4: (Applicable to IDC Ph.D. programme- 173rd Senate Mtg. held on 23rd March 2005)

a) Students with Postgraduate design entry the credit requirement is 24 credits:

I-semester – 20 credits; II semester – 4 credits

b) Students with Undergraduate design entry the credit requirement is 56 credit and the courses will be common with the existing M.Des. Programme.

R.4.5. :

The DPGCs/IDPCs shall carefully examine any case of reduction in course credits and recommend to the PGAPEC such cases giving appropriate justification in terms of any relevant post B.Tech./M.Sc./M.A. or equivalent qualification or proven capacity for independent research. While approving the cases of students who have been recommended by the respective PGCs/IDPCs for reduced course credits the reason for prescribing such reduced course credits shall be placed by the PGAPEC before the Senate for information. In no case shall be reduced credits requirements be less than **24 credits**.

R.4.6 :

The **full-time students** shall register through their respective Faculty Adviser(s)/ Supervisor(s) for not less than 18 credits in the first Semester of the course programme if the total credits required are 18 or more. However, staff members of the Institute admitted to Ph.D. programme shall register **for not more than 18 credits in the first Semester** of the courses programme if the total credits required are 28 or more. Other students with course credits requirements below 18 credits shall register through Supervisor(s) for the entire prescribed credits in the first Semester itself.

R.4.7. :

Language course shall not form a part of minimum requirements of credits, prescribed for students with M.Tech. or equivalent qualification.

R.4.8. :

Students who are unable to commence their course programme during the Semester in which they have been admitted should apply to PGPC through DPGC/IDPCs/PGCs and obtain permission to commence their course work in the following semester.

R.4.9 :

The procedure for registration for courses shall be as follows:

- a) The students, after payment prescribed semester fees, complete their registration through On-line in consultation with faculty advisor(s) in the department. Such registration is required to be approved by his/her faculty advisor.
- b) The students, in consultation with the supervisor/faculty advisor, can do course adjustment within the time limit provided in the Academic Calendar.
- c) The DPGC/IDPC/PGC shall finalize the course programme of the students in consultation with the Supervisor(s).
- d) Recommendations, if any, about reduction of course credits shall be sent to PGAPEC by DPGC/IDPC/PGC in the beginning of the I or II semester along with the applications for registration for due approval.
- e) The Academic Office shall inform the PGAPEC of any discrepancy in the Registration. However, the students should ensure on their own that they comply with the credit requirements listed under R.4.1, R.4.2,R.4.3,R.4.4, R.4.4.1,R.4.4.2. R.4.4.3 above.
- f) The PGAPEC shall approve the course programmes of all students after due scrutiny.

R.4.10 :

A student can add to his/her academic load one or more courses not registered for earlier or substitute one or more courses by others by filling the Course Adjustment Form, within the first two weeks from the commencement of classes

provided the course credit requirements as prescribed under R.4.1, R.4.2, R.4.3, R.4.4, R.4.4.1, R.4.4.2, R.4.4.3 remain unchanged.

R.4.11 :

A student registered under R.4.2 and R.4.3 may drop in the first or second semester one or two courses for which he/she may have registered if the academic load for the given semester is found to be too heavy (Course Dropping Form). Such dropping is permissible within eight week of the commencement of classes provided the credits requirements laid down in R.4.1,R.4.2, R.4.3, R.4.4.1, R.4.4.2 and R.4.4.3 are not violated.

Note :

The student shall do the prescribed Course Adjustment Form (CAF) and Course Dropping Form (CDF) in consultation with the supervisor.

5. Course Assessment and Award of Grades

R.5.1 :

For every course taken by the student, he/she is assigned a grade based on his/her combined performance in all the assessments. These grades are described by the following letters and corresponding grade points.

AA (10 points), AB (9 points), BB (8 points), BC (7 points), CC(6 points), CD(5 points), DD (4 points), and FF (0 points), FR (0 points), PP (Passed), NP (not Passed), XX (0 points). **Minimum passing grade in a course is 'DD'.**

The minimum passing grade for all UG and PG courses is DD. **However, the PG students should acquire a minimum CPI of 6.00 at the end of each semester.**

R.5.2 :

The letter grades FF and FR shall be treated as failure grades. **Re-examination may be permitted for a course if he/she obtains FF grade.** After such re-examination **if the student passes in that course, he/she will be awarded the maximum grade of DD* in that course.** If a student does not take or fails in the re-examination, he/she will be awarded the grade FR. (* Ref. 167th Meeting of the Senate).

R.5.3 :

A student will be permitted to take re-examination for a course where he/she has an FF grade provided the number of failed backlog courses (with FR/XX grade) does not exceed the limit permitted i.e. two or more during entire programme. (Ref. 167th Meeting of the Senate and 182nd Senate).

R.5.4 : **Audit Course**

The students registered for auditing a course shall be awarded the grade AU if they fulfill the requirement of a minimum of 80% attendance and duly satisfactory in-semester performance as prescribed by the Instructor. The Instructor shall include such AU grades in the final grade report for that course. **If the student does not qualify for the grade AU, it will be assumed that the course has been dropped** by that student and the semester grade card issued accordingly.

R.5.5 : **II grades**

The grade II shall be awarded to a candidate in a lecture course in which he has satisfactory in-semester performance but who could not appear for end-semester examination for bonafide reason viz. of an illness or a serious accident to himself/ herself, or death of a parent/ guardian. In the case of illness or accident to the candidate, the application for the re-examination should be supported by the medical certificate from the Senior Medical Officer of the Institute or a Civil Surgeon. A student obtaining the grade II is entitled for a re-examination in that course and after such a re-examination, the Instructor will award an appropriate grade to him/her. If no medical certificate is received, before re-examination schedule, his/her II grade will be converted into FR and result will be finalized accordingly.

R.5.6 : **Seminar Grades**

For the students who have submitted the seminar report in time, but the evaluation of which however could not be completed, the Seminar Co-ordinator shall award the grade II and shall forward the grade report to the Academic Office before the end of the semester. All such II grades shall be converted into suitable letter grades in due course of time, before one month following the end of the semester.

R.5.7 :

If a student either does not submit his seminar report by the prescribed date or he/she is absent for presentation on the scheduled date he/she shall be awarded FF grade unless he/she is given extension by the coordinator under exceptional circumstances.

R.5.8 :

All students who get **FF grade in Seminar shall be allowed** to complete the evaluation during the period earmarked **for re-examination and will not be given a grade better than the minimum passing grade, DD.** (Ref. 167th Meeting of the Senate).

R.5.9 : **XX Grade**

1.The grade XX in a course is awarded if a student does not maintain the minimum 80% attendance in the Lecture/Tutorial class and **will have to re-register** for the same course.

2.The XX grade will be declared in the first week of November for the Autumn Semester Courses and in the first week of April for Spring Semester Courses.

3.A student with XX grade in a given course is not permitted to take the semester-end Examination in that course. He/She is also not eligible for Re-examination in that course. Such a student has to Re-register for the same course in core, else another course.

4. The CPI/SPI of the student will be calculated with zero points for XX and then the rules of continuation will be applied.

6. PERFORMANCE REQUIREMENTS IN COURSE WORK FOR QUALIFYING TO REGISTER FOR THE PH.D. DEGREE

R.6.1:

ALL STUDENTS ARE REQUIRED TO MAINTAIN A CPI OF 6.00 AT THE END OF EACH SEMESTER.

The performance of a student in a semester is indicated by a number called the Semester Performance Index (SPI). The SPI is the weighted average of the

grade points obtained in all the courses taken by the student during the semester.

Example : Suppose in a given semester a student has taken five courses having credits C_1, C_2, C_3, C_4, C_5 and his/her grade points in those courses are G_1, G_2, G_3, G_4, G_5 respectively.

Then his/ her

$$\text{SPI} = \frac{C_1 G_1 + C_2 G_2 + C_3 G_3 + C_4 G_4 + C_5 G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

SPI will be calculated (after re-examination, if any) on the basis of the final grades awarded AA, AB, BB, BC, CC, CD, DD and FR. The SPI is calculated up to two decimal places.

An up-to-date assessment from the time the student entered the Institute is obtained by calculating a number called the Cumulative Performance Index (CPI). The CPI is the weighted average of the grade points obtained in all the courses taken by the student since he/ she entered the Institute. It is calculated in the same manner as the SPI.

R.6.2: FOR CANDIDATES WITH CREDIT REQUIREMENT OF 16 TO 22 CREDITS

i) In the first semester, if a student fails in only one course and obtains the grade FF, he/she can avail of a re-examination in that course at the end of first semester. However, if he/she obtains more than one FF grade or an FR grade, he/she is not entitled for a re-examination.

ii) The credit requirement as prescribed by the DPGC/IDPC/PGC must be completed at the end of the first semester.

R.6.3: FOR CANDIDATES WITH CREDIT REQUIREMENT OF MORE THAN 22 CREDITS

i) A student must not obtain a failure grade (FR) for more than one course in his/her entire course programme, else he/she has to quit the programme.

ii) In a semester, if a student fails in only one course and obtains the grade FF, and if he/she has not obtained a failure grade (FF or FR) in first semester then he/she can avail of a re-examination in that course at the end of that semester. However, if a student obtains more than one failure grades, then he/she is not entitled for re-examination and he/she has to quit the programme.

iii) In a given semester, if a student fails in only one course and obtains the grade FR (after a re-examination, if any), and if he/she has not obtained a failure grade (FF or FR) in an earlier semester then he/she will register either for the same course or for an alternative course in the next semester, as prescribed by the DPGC/IDPC/PGC.

iv) The credit requirement as prescribed by the DPGC/IDPC/PGC must normally be completed by the end of the second semester.

R.6.4:

All categories of students not fulfilling the requirements as enumerated in R.6, R.6.1 and R.6.2 all liable to discontinue their Ph.D. programme. The PGAPEC will take a decision in this regard after reviewing the cases of such students.

R.6.5: **Confirmation of Registration**

Students registered under R.4.1 who successfully complete their course credit requirements in one semester shall be granted registration from the beginning of the semester in which they complete the course credit requirements or from the date of joining the programme, whichever is later.

a) Students registered under R.4.2 shall be granted registration from the first working day of the semester following the one in which they complete 18 course credits, provided they complete the remaining course credit requirement in the two semesters following the date of registration so granted.

R.6.6:

All Ph.D. students may be allowed to register for extra credit courses, after confirmation of registration by following the present rules for confirmation of registration i.e. SPI/CPI above 6.00, etc.

a) The present procedure for confirmation of registration will continue.

b) Extension of registration beyond the duration as specified in the rules will not be considered due to registration for extra credit courses.

(Ref. 168th Meeting of the Senate)

R.6.7:

Registration dates of all students shall be decided by the PGAPEC. The final approval to the registration shall be granted by the Senate.

R.6.8:

The procedure for confirmation of Registration shall be as follows:

- i) Each student, on completion of the course requirements prescribed by DPGC/IDPC/PGC shall apply for confirmation of Registration.
- ii) The completed application form shall be forwarded by the DPGC/IDPC/PGC to the PGAPEC which will consider this application and confirm the date of registration according to R.6.5 and R.6.6 whichever is applicable.

7. Supervisor/Co-supervisor

R.7.1:

In each Department, applicants will be given at the time of selecting the details of various research topics areas proposed by various faculty members for Ph.D. programmes so that they will have an opportunity to discuss those topic areas with the respective faculty members and thereafter, indicate their choice in order of preference. The applicants shall then be interviewed by a committee constituted by the DPGC/IDPC/PGC.

R.7.2:

- a) **All selected students shall be assigned tentatively to research supervisor(s) at the time of selection. However, a regular Research Scholar may opt to find a supervisor at the end of the first semester, if he/she so desires. The Head of the Department would act as supervisor until the student is assigned to a supervisor.** Alternatively, the Head of the Department may himself act as a supervisor until the final allotment is done.
- b) Each external student shall have only one Supervisor in the sponsoring organization where he/she is employed and one or two at the Institute.
- c) The research Programme and the specific area of research of a selected student shall be finalised by his/ her Supervisor (s) after mutual discussion.

All Research Scholars should be finally assigned to Research Supervisor (s) at the time of confirmation of Registration.

R.7.3:

a) Change of Supervisor(s) under exceptional circumstances shall be permitted on recommendation of the DPGC/IDPC/PGC after obtaining the consent of (i) the student (ii) the present Supervisor(s) and (iii) the proposed Supervisor(s).

b) If the research programme and/ or area of the work requires modification due to this change, the student's entire course programme requirement shall be examined by the DPGCs/IDPCs/PGC. If there is a change in the research programme and/or area of the work, the registration date may be revised, if found necessary.

R.7.4:

a) Whenever a Supervisor leaves the Institute permanently or temporarily for a period exceeding one year, the DPGCs/IDPCs/PGCs shall provide new supervisor(s) for the students before his/her departure.

b) Whenever a Supervisor leaves the Institute temporarily for a period less than one year, the DPGCs/IDPCs/PGC shall make alternate arrangement for the guidance of his/her students.

c) The DPGCs/IDPCs/PGC may consider continuation of the original Supervisor on his/her return to the Institute, as Co-Supervisor of his/her students depending on the period for which he/she has supervised the Ph.D. Programmes.

d) Any such arrangements made shall be forwarded to PGAPEC for prior approval.

R.7.5:

At any given time the number of Institute research scholars working with a supervisor shall not exceed three while the total number of all categories of research students working with him/her shall not normally exceed eight.

R.7.6: RESEARCH PROGRESS COMMITTEE

After the completion of the candidates specified course requirements, the DPGC/IDPC/ PGC will constitute Research Progress Committee (RPC) for all candidates in consultation with the Supervisor and Co-Supervisor if any. The RPC will normally consist of the Supervisor & Co-Supervisor (if any) and two faculty members conversant with the field of research. The Co-Supervisor and/or member of the RPC may be from outside the Institute. (Ref. 136th Meeting of the Senate).

The names of the RPC members and any subsequent changes in its composition shall be communicated by the DPGC/IDPC/PGC to the PGAPEC for record.

Normally one of the RPC members is expected to function as the internal examiner for the evaluation of the thesis.

The RPC is expected to monitor the progress of the candidate until the completion of the programme.

8. Place of work, Progress and Duration

On the recommendation of the Supervisor(s) and the DPGCs/IDPCs/PGCs the Institute may allow the research work for the Ph.D. degree to be partially or whole carried out at another organization for the following categories of Ph.D. students with following provisions:-

R.8.1:

a) The external organization where a student wishes to carry out the research work partially or wholly shall have to be recognized by the Institute before such work is undertaken. **Persons working in Institutions, which are affiliated to Universities where facilities for registration of postgraduate programmes exist are not eligible for registration as external students.** The financial and other implications, if any, of such an arrangement should be finalised at the Institute level. The student, however, shall not be permitted to change his/her student status (as given under R.1.1) while working at such an organization.

b) An external organization may be granted recognition by the PGPC as an approved place of work.

i) The recognition shall normally be given only for the purpose of individual research project by a particular student.

ii) The details of research facilities available at the organisation shall be furnished by the student along with the application for admission to Ph.D. programme.

iii) The DPGC/IDPC/PGC shall examine the details given and may decide either to ask for further information, or even collect first hand information, if necessary, by deputing faculty member(s) to visit the organisation. Only when the DPGC/IDPC/PGC is fully convinced about the adequacy of the research facilities and the credentials of the external supervisor, it shall recommend the case to the PGPC.

R.8.2 :

All students registered for Ph.D. irrespective of their category, shall have to register every semester along with a brief report on the earlier semester(s) work and plan for the ensuing semester.

a) All candidates, after joining, submit through supervisor(s), a Annual Progress Seminar of their work in previous academic year to the concerned DPGC/IDPC/PGC once a year in July/January depending upon the time of admission. For all categories of students, this seminar must be given on or before 31st August or 31st January of each year (However, in case of CSIR/UGC fellows, the dates of their Annual Progress Seminar be fixed by considering requirements of funding agency and such fixed schedule be followed strictly : as amended in the 179th Meeting of Senate held on 12.05.2006). Regular research scholars are liable to loose scholarship if the seminar is delayed beyond said dates. Such seminars are requested to be given (every year) until the synopsis and thesis is submitted.

This is also required for renewal/enhancement of assistantship an confirmation/continuation of their programme.

All external students must also give, at least one Seminar per year at the Institute until they submit the synopsis and thesis. At the end of three years from the date of registration of the student, the DPGC/IDPC/PGC shall appoint a committee to review his/her progress in Courses/Seminars for the approved research programme and shall forward the report to PGAPEC.

The following guidelines are being followed for avoiding delays in presentation of Annual Progress Seminar:

1. Every Ph.D. student must present the Annual Progress Seminar as per prescribed schedule every year.
2. In case, due to some valid reasons, if he/she is not able to present Annual Progress Seminar in time, an application for extension must be made at least 15 days before the due date of presentation.
3. Extension will be granted by PGAPEC on case to case basis with or without fine or presentation @ Rs. 750/- per week, from 1st September/1st February as the case may be, till the date of presentation of APS.
4. If the application for late presentation of Annual Progress Seminar is made after the due date, additional fine of Rs.750/- will be charged for not applying for extension in time.
5. The report of Annual Progress Seminar in a prescribed format should reach Academic Office within four days after the presentation.
6. Delay beyond 30th September/28th February (as applicable) may lead to discontinuation/cancellation of Teaching Assistantship and/or Registration.
7. The assistantship for the period beyond the due date of renewal/enhancement of Assistantship will be released only after receipt of satisfactory report subject to recovery of fine, if any.
8. **All Research Scholars, irrespective of their basic qualifications should give Annual Progress Seminars after completion of one year of their date of joining. This is applicable to Research Scholars who have joined their Ph.D. Programme effective from July 2003. (Ref. 167th Meeting of the Senate).**

The continuance of registration of all students is subject to satisfactory progress made by them.

In case of Assistantship holders, the continuance of Assistantship beyond 3 years will also be subject to satisfactory progress made by them, as assessed by a panel appointed by the respective DPGC/IDPC/PGC.

Above rules are also applicable to CSIR/UGC fellows. In case of CSIR/UGC Fellows, the date of their APS be fixed by considering

requirements of funding agencies and such fixed shedule be followed strictly (179th Senate).

R.8.3 :

- a) Every external student shall carry out a part of study of his/her research work residing at the Institute for a period, which shall in no case be less than one semester.
- b) **Residential requirement must be fulfilled in the first two semesters for students with B.Tech./M.Sc./M.A. or equivalent qualification** who have been advised to acquire 18 or more credits.
- c) **Students with M.Tech./M.E. or equivalent qualification** who are advised to acquire between 16 to 22 credits have to fulfill the residential requirement **in the first semester only**.
- d) Students sponsored by local Organisation may, on the basis of an application recommended by DPGC/IDPC, be exempted from stay on the Institute campus while fulfilling the requirements under (a) above. However, the work under this rule shall be carried out during normal working hours of the Institute.
- e) The organization has to certified that the student has been fully relieved of normal duties/ granted leave during the period of the residential requirement.
- f) External students will be provided with hostel accommodation only during the semester(s) in which the residential requirement is fulfilled.

R.8.4 :

All students (except external students) have to carry out research in the Institute for at least a period of **two calendar years from the date registration** before submission of thesis. **External students have to carry out research for at least a period of three calendar years from the date of registration** before submission of thesis.

R.8.5 :

- a) **For all categories of students, the period of validity of their Ph.D. registration is six years from the date of registration.** The students may submit their thesis before the end of this period subject to the provisions of R.8.4. Any student who concurrently registers for any postgraduate degree at another organization shall be automatically deregistered at the Institute.
- b) Research scholars/Staff who have submitted pre-synopsis seminar may be permitted by PGAPEC on recommendation of the DPGCs/IDPCs/PGCs to leave the Institute and submit the synopsis and thesis together from outside within a period of four months from the date of pre-synopsis provided they fulfill the provisions of all other rules. In case the student does not submit his/her synopsis & thesis together within four months from the date of presentation of pre-synopsis seminar, his/her registration will be deemed to be cancelled.

9. Thesis Evaluation

R.9.1(i) : Pre-synopsis Seminar

Prior to the submission of the synopsis and thesis, a comprehensive internal assessment of the research work should be made by a panel appointed by the DPGC/IDPC/PGC in consultation with the supervisor(s).

- a) RPC shall assess the work through a pre-synopsis seminar. The student can submit the synopsis only if the panel is satisfied about the quality of the work for submission as a Ph.D. thesis.
- b) Details of the pre synopsis seminar shall be adequately notified so as to enable interested staff members and students to attend the same.
- c) The Convener of the DPGC/IDPC/PGC shall forward the panel reports to the Academic Office.

R.9.1(ii) : Two Published papers

Prior to the submission of the synopsis and thesis, the following requirements has to be completed by the student:

- At least two papers published/accepted for publication in refereed journals of repute

OR

- At least one paper published/accepted for publication in refereed journal of repute and atleast one paper published/accepted for publication in the proceedings of an International Conference.

The concerned PGCs will be the authority to decide upon the quality of journal and standard of publications and its equivalence (Ref. 177th Meeting at the Senate held on 19th October 2005).

9.2 : Submission of Synopsis and Thesis

1) The student shall submit 4 copies of the synopsis and 5-6 copies of the thesis to the DPGC/IDPC/PGC within a period of four months from the date of presentation of pre-synopsis seminar. **In case the Synopsis and Thesis are not submitted in the specified period, the student may be asked to present another pre-synopsis seminar.**

2) The synopsis written in the approved format shall be submitted to the DPGC/IDPC/PGC, four copies of the synopsis will be submitted to the Academic Office with the following certificates.

3) Certificate from the Convener, DPGC/IDPC/PGC that the prescribed course credits are completed.

1. Certificate from the Convener, DPGC/IDPC/PGC that the pre-synopsis seminar has been completed satisfactorily.
2. Certificate from the Research Supervisor(s) states (i) that there is a prima facie case for consideration of the thesis, (ii) that the thesis does not contain any work which has been previously submitted for the award or any degree and (iii) the extent of collaboration, if any.

4) Students should also submit electronic copy of the synopsis in form of PDF format, which is to be mailed to dracad@iitb.ac.in

5) The thesis shall be written in the approved format. This may be collected from the Academic Office.

6) The DPGC/IDPC/PGC should send the panel of examiners to the Academic office in closed CONFIDENTIAL cover at least eight days before the date of submission of synopsis and thesis by the student. (Ref. 171st Meeting of the Senate).

7) Along with the thesis, the student shall submit the requisite forms containing the authorization from the Research Supervisor(s) for submission of the thesis and a certificate from Accounts Section and Hostel that there are no dues against the student.

8) The DPGC/IDPC/PGC in consultation with the Supervisor(s) shall recommend to the PGPC, a panel of 8 External Examiners (experts for thesis evaluation) as well as the names of Chairman (2 names) and Internal Examiner for the viva-voce.

9) Experts who have been thesis examiners during the preceding one or two year, should not be included in the panel.

R.9.3: Format for Synopsis and Thesis

The length of a thesis shall be one thousand to four thousand words including tables and figures, on A-4 size papers typed in one and half space. Guidelines for preparation of thesis may be collected from the Academic Office.

R.9.4:

a) From the panel of external examiners duly approved by the PGPC, the Chairman, Senate will chose **5** names in order of preference. The synopsis of the thesis will be sent to first **three** examiners. Two names will be suggested for Chairman, Board of Examiners, for conducting the viva-voce, the supervisor being free to request either person. (amended as resolved in 136th Senate meeting held on 27.11.1996 and 181st Senate).

b) The referees shall independently report to the Senate through the Registrar of the Institute, preferably within six weeks from the date of their receipt of the thesis. The Registrar should convey to the referees that their reports should include:

- i) A critical survey and evaluation of the quality and quantity of the work as embodied in the thesis.
- ii) Questions, if any, to be asked or points to be clarified at the viva-voce examination, and
- iii) A definite recommendation as to whether the thesis is acceptable for the award of the degree of Doctor of Philosophy.

c) The Internal Examiner of the Ph.D. thesis will be a faculty member of the Institute, who is a member of the RPC of the concerned student. It is recommended that the panel of examiners for thesis evaluation shall contain at least two experts from reputed Institutions outside the country.

(Ref. 136th Senate Meeting held on 27.11.1996)

d) If a referee in his/her report is not in a position to make a definite recommendation for the award of the degree, he should be requested to assist the Senate in deciding whether the student is requested to make:

- i) Substantial revisions involving rewriting of one or more chapters without, however, doing any further research work.
- ii) Completely rewrite, if the thesis, though not acceptable in the present form, reveals sufficient quality and quantity of work to warrant the student being given an opportunity for further research work and/or reinterpretation of results.

R.9.5:

a) The copies of the referee's report will be made available to the supervisor/co-supervisor and the internal examiner. They may submit their report for consideration and approval by the PGAPEC ensuring that all the corrections including minor modifications, revision suggested by the external referees have been/will be incorporated. They may also recommend whether the presence of an external examiner is required during the Ph.D. defence. (amended as resolved in 136th Senate meeting held on 27.11.1996)

b) On the basis of the referee's report, the comments of the Supervisor(s) and Internal examiner(s) thereon, the PGAPEC shall, recommend to the Chairman, Senate whether the thesis be accepted for the viva-voce examination or be rejected or be referred again to a new referee.

c) A thesis may be considered acceptable for holding the viva-voce examination if both the referees give positive recommendation. If one of them accepts and the other rejects the thesis, as it shall be referred to a third referee chosen from the panel of examiners be the Senate Chairman.

d) Whenever a thesis is referred to a third referee, the comments of the supervisor point by point for the queries by the first two referees should also be reported to the Senate. (3.1 (4) 168th meeting of the Senate)

e) The Senate shall, however be the final authority in deciding whether the thesis be accepted for the award of degree.

R.9.6:

a) If the referee(s) recommend acceptance of the thesis subject to major modifications only, the thesis can be resubmitted only once after incorporating the modifications, within a period of three* months. The thesis so resubmitted shall be examined by the same referee(s). (* Ref. 171st Meeting of the Senate). However, the permissible period of three months is extendable on case-to-case basis for maximum period of six months.

b) A thesis rejected by two referees may be resubmitted after revision, not earlier than one year and not later than two years from the date of such intimation to the student by the PGAPEC. The thesis so resubmitted may be examined by the same referees or by new referees.

c) Rejection of the thesis so resubmitted will disqualify the student from further consideration for the award of the Ph.D. degree, in the topic of research chosen by him.

R.9.7:

a) A student, whose thesis has been accepted for the award of the Ph.D. degree, shall be required to defend his/her work at an open viva-voce examination conducted by a Board of Examiners at the Institute.

b) The Board of Examiners shall be appointed by the Chairman, Senate and it shall consist of:

i) A professor of the Institute, outside the department as Chairman;

ii) The research supervisor(s);

- iii) **A faculty member of the Institute conversant with the subject to act as an internal examiner; and**
- iv) **One of the referees, failing which an examiner from the approved panel.**

c) The Board of Examiners shall submit its report in the prescribed form to the Senate.

R.9.8:

a) On satisfactory completion of the viva-voce examination, the degree may be conferred upon the student after approval by the Senate.

b) If a thesis has been accepted but the student fails at the viva-voce examination, he/she may be permitted by the Senate Chairman to re-appear for viva-voce examination again at a later date. The recommendations of the Board of Examiners conducting the viva-voce examination shall be considered in taking a decision in this respect.

c) After successful completion of the viva-voce examination, the student shall submit to the Academic Office the first and second copies of his/her approved thesis, duly bound, together with the application for submission of the same in the prescribed format (R.9.3.a).

10. Teaching Assistantship

R.10.1:

The Institute research scholars will be paid scholarship at a rate in accordance with the directives from the appropriate authorities.

R.10.2:

Institute research scholars are eligible to receive Assistantship for a maximum period of four/five years according to their qualifying degree, as communicated by the MHRD.

R.10.3

a) All Institute research scholars shall apply for enhancement of Assistantship two weeks before completion of two years from the date of joining. They shall submit five typed copies of summary of their work described in five to six pages, to the Convener,

DPGC through their respective supervisor(s). A special committee either for each research scholar or for a group of them as may be found convenient, consisting of three or four members, including the Supervisor(s) shall be constituted by the DPGC/IDPC/PGC for this purpose. Each research scholar concerned shall give a seminar before this committee will assess the candidates' work, progress and make suitable recommendations. The recommendations of the committee along with the application for enhancement of scholarship of the research scholar should be forwarded by the DPGC/IDPC/PGC (comments, if any) to the PGAPEC within two weeks after completion of two years.

b) Subject to satisfactory assessment, the candidates will be eligible for enhanced Assistantship from the completion of two years from the date of joining.

c) If in the opinion of the committee the enhanced Assistantship cannot be recommended, the committee may stipulate a period of time, not less than three months, for the candidate to re-appear before the committee for the consideration of enhanced Assistantship.

11. LEAVE RULES

1) All Research Scholars under TA/RA/SF are entitled for leave for a maximum of **thirty days per year** in addition to Public Holidays. Also **10 days leave** on medical reasons. The leave due can be carried over to the next year and accumulated **upto 90 days**.

2) Women Scholars are entitled for **maternity leave** at full rate for a period of not exceeding 135 days, once during the tenure of their award. This should be supported by medical certificate.

3) Male Scholars are entitled for 15 days **paternity leave** once during the tenure of their award. This should be supported by the medical certificate.

Head of Department is authorized to sanction the above leave.

4) No vacation in Summer/Winter is admissible.

5) Special Leave to attend Seminars/Conferences in India/abroad to present paper with the permission of **Dean of Academic Programmes**.

6) Research Scholars under CSIR/UGC and other categories are governed by their own rules.

June 2007