Post Graduate Manual

iMTech Programme

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY, BANGALORE

Document Control

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1 INTRODUCTION

The goal of post graduate programs at IIITB is to develop professionals of the high quality to cater to the needs of industry and academia. Such education is based on a broad grasp of the fundamental principles of the sciences and scientific methods, a deep understanding of specific area of specialization, an ability to solve new problems, and a capacity to learn continually and interact with multidisciplinary groups. Above all, IIITB aims at developing in its students a capacity for free and objective enquiry, courage and integrity, and awareness and sensitivity to the needs and aspirations of society.

The postgraduate programs are designed with the above goals in view. They include courses of study, seminars, project work, internships, and research leading to a thesis.

The procedures documented in this manual embody the philosophy of the postgraduate education and ensure a high standard of performance at the Institute. Within this general framework, and subject to the approval of the Academic Senate, hereinafter called the Senate, additional requirements may be stipulated.

The Institute offers the following post graduate programs

1. Integrated Master of Technology - dual degree (M.Tech. and B.Tech)

2. Master of Technology

3. Master of Science by Research (MS)

4. Doctor of Philosophy (PhD)

5. Other programs as may be approved by the Senate from time to time

This manual provides details about the Integrated Master of Technology (iMTech) program. The iMTech is a ten semester program. The first eight semesters of the program constitute academic course work. During the ninth and tenth semester, a student takes up academic research at the Institute or at a designated research centre as may be decided by the faculty supervisor to write a thesis. Internship with Industries is arranged during summer vacation at the end of sixth semester. The details of the program are provided next.

2 Academic Session and Registration

2.1 Academic Session

The academic session of the Institute is divided into three parts: two regular semesters and a summer term. The first semester will usually commence in the first week of August every year and ends in the first week of December, and the second semester commences in the first week of January and ends in the first week of May. The summer term will run during May and July. The exact calendar for each year will be announced at the beginning of that year.

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3.1 Regular Registration

1. Every student is required to register at the beginning of each semester for the courses that he or she intends to pursue in that semester. The registration process involves:

    a. Payment of fees for that semester and clearance of any outstanding dues, and

    b.   Signing the registration (including the online process) roll.

2. A new entrant to the iMTech program who is awaiting the results of the qualifying examination may be allowed to register "provisionally". Provisional candidates are required to complete all the requirements for graduation to the qualifying certificate no later than the end of the first semester, failing which their admission may be cancelled.

3. All students who are not on authorized leave must continue to register in every semester till they finish their program.

4. Late Registration

   1. If for any compelling reason like serious illness, a student is unable to register on the day of registration, he/she may be allowed to register on the day of late registration specified in the academic calendar (which is about one week from the date of registration). Any student registering late shall be required to pay the specified late registration fee. No late registration is permitted for the summer term.

   2. In exceptional cases, the Senate may consider registration beyond the date of late registration.

3.2 Thesis Advising

A student registering for thesis credits must have a thesis supervisor assigned to him /her.

3.3 Semester Load Requirements

For a full time student a semester load shall be 20 credits. Credits for each course is calculated based on the number of instructions hours, and hours spent in the laboratory per week and is notified in the course manual. However the Senate may permit a student to register for a maximum of 24 credits or a minimum of 12 credits. This stipulation does not apply to summer term where every student is expected to register for all the courses specified for that summer term.

3.4 Summer Term Registration

Students may register in the summer term for up to a maximum of 9 credits. Registration during the summer term is optional except during the summer term at the end of 3rd year of study when registration of 4 units is required towards mandatory Industry Internship.

3.5 Adding/Dropping of Courses and Withdrawing from Courses

1. Adding and dropping of courses after registration is permitted and the last dates are specified in the calendar. No adding or dropping of courses is permitted in the summer term.

2. A student may be required to drop a course at any stage if it is determined by the Senate or Senate sub Committee that he/she does not fulfil the prerequisites for the course, or if a timetable clash exists which does not permit him/her to attend all the meetings of the course, or any rule in this manual which forbids him/her to take the course(s) that he/she has registered for.

3. LEAVE RULES

Students may be granted leave on application to the Registrar, as per the leave rules approved by the Senate. Leave rules as approved by the senate is at annexure 1.

4 PERMISSION TO PROCEED FOR ACADEMIC WORK OUTSIDE IIITB

Provision to proceed to other academic and research institutions in India or abroad as visiting students is available. An iMTech student who has completed two years and who has obtained a minimum CGPA of 2.4 and who have not obtained 'X' or 'F' grade in any subject may proceed to another academic institution in India or abroad with prior permission of the Senate. In case the student would like the work carried out by him in the other institution be counted towards his/her credit requirement, he may submit a written application to the Senate, giving complete details of the work carried out, and assessment reports if any. The decision of the Senate is final and binding.

5 ACADEMIC REQUIREMENTS

5.1 Minimum Residence, Maximum Duration and Academic Requirements

The following table lists the minimum residence and the maximum duration allowed in the iMTech Program and credit requirements for graduation:

To satisfy the "Minimum Residence" requirements, registration must be over consecutive semesters; exception shall be made only if the student is on authorized leave. "Maximum Duration" is counted from the student's first registration date. SGPA (Semester Grade Point Average) / CGPA (Cumulative Grade Point Average) shall be calculated on the basis of all courses taken by the student.

Program	Minimum Total Credits	Credits Through Course Work (Minimum)	Credits Through Research/Internship (Minimum)	Minimum Residence	Maximum Duration
iMTech	204	168	32 (research) / 4 (internship)	10 Semesters	7 Years

Table 5.1.1

• All the courses declared as "core courses" by the Senate are mandatory

• Every student must choose a specialization stream (referred to as 'area of specialization') at end of the fifth semester. The maximum number of students who can be admitted to an area of specialization will be determined and notified by the Senate. In case the number of students opting for a particular area of specialization is more than the specified number, allotment will be made based on the CGPA obtained by the student at the end of the fifth semester. If any student wishes to change his/her area of specialization at a later date, his application for such a change shall be examined by a subcommittee of the Senate constituted by the Senate Chairman. The recommendation of the subcommittee shall be placed before the Senate for final decision.

• A student must take a minimum of eighteen courses, from the pool of courses declared as elective courses by the Senate spanning both IT and non-IT subjects. Elective courses belonging to a given area of specialization is called 'stream elective'. A minimum of seven elective courses taken must belong to the student's area of specialization, a

minimum of three electives must be taken from the other area of specialization and a minimum of four electives must be taken from the area of Humanities, Social Sciences and Management. The minimum requirements and overall requirements are shown in Table 5.1.2 and Table 5.1.3, respectively.

S. No.	Requirement	Minimum number of courses
1	Stream electives (IT)	7 (28 credits)
2	Non-stream electives (IT)	3 (12 credits)
3	Humanities, Social Sciences and Management (HSS/M)	4 (16 credits)

Table 5.1.2

S. No.	Category	# Credits
1	IT core	46
2	IT electives	44
3	IT Thesis	32
4	IT Summer Internship	4
5	Mathematics + Physics + Chemistry/Introductory Bioscience	28
6	HSS / Management	16
7	Basic Engineering Sciences / Skills	20
8	Application of IT to Domains	8
9	Introduction to Profession + Technical Communication + English + Physical Education	6
	Total	204

Table 5.1.3

- When a student fails a course, whether from their chosen area of specialization or from another, (s) he must make it up by taking the same course again or replacing it with another course in the same category a course from the same area of specialization (even if it is not the same course).

- Industry internship and Research Thesis is mandatory

- Area of specializations

    At the present time there are two area of specializations. Area of specializations 1 and 2 have sub disciplines as defined below:

Area of specialization 1 (Electronics & Communication Engineering)

- Networking and Communication systems

- Embedded System Design

- Signal processing

- Information Technology and Society,

Area of specialization 2 (Computer Science and Information Systems)

- Computer Science

 – Software engineering

 – Database and Information systems,

 – Information Technology and Society

- The overall programme structure shall be as per the Course Manual approved by the Senate and being in force on the date of first registration.

5.2 Grades, Semester and Cumulative Performance Index

1. The Institute follows a 4-point System. A student is awarded a letter grade in each course he/she is registered for, indicating his/her overall performance in that course. There are twelve letter grades: A, A-, B+, B, B-, C+, C, D, F, S, X and I. The correspondence between grades and points (on a 4-point scale) is given below:

Letter Grade	A	A-	B+	B	B-	C+	C	D	F
Grade Points	4.0	3.7	3.4	3.0	2.7	2.4	2.0	1.0	0.0
Description in transcript	Excellent		Good			Satisfactory		Poor	Failure

The grades S, X and I do not carry any grade points and are interpreted as follows:
S: Satisfactory X: Unsatisfactory I: Incomplete

However, an instructor / supervisor need not use all the available letter grades while grading and may choose a sub set of letter grades. Thus three grading systems are in use. , i.e., (i) 9-letter grades: A,A-,B+,B,B-,C+,C,D,F; (ii) 5-letter grades: A,B,C,D,F; (iii) 2-letter grades: S,X..

2. If a student does not complete all the requirements for a course for a genuine reason, the instructor may award the grade I (Incomplete). An I grade must be converted by the instructor to a regular letter grade by the last date for such conversion specified in the Academic Calendar, failing which it is automatically converted to an F grade.

3. A course with either a D or an F grade must either be repeated or substituted with another course as suggested by the SENATE.

4. Grade Improvement Process: Students who, at any point of time during their study at IIITB, have obtained CGPA less than 2.40 and thus determined to be deficient may be allowed to improve their CGPA, if they apply in writing within one week of the announcement of grades for the previous semester, in the following manner.

5. They can, improve their grades in courses where they have obtained F or D or C. The Course instructor will determine the assignments, examinations, laboratory work, projects or research papers that they have to undertake and the time period over which the deficient student have to complete the tasks as assigned by the course instructor. Based on the work and an examination of student's performance the course instructor will assign him/her a letter grade at the end of the study period. If the grade thus obtained by the student is better than the grade obtained earlier, the grade obtained shall be substituted and the new CGPA calculated. The earlier grade obtained shall be indicated in the grade sheet, with a remark that this course was repeated and grade improved.

6. In case the grade obtained is same or lower than the grade obtained earlier, the earlier grade will stand.

7. In case the course instructor is not available, the Senate Chairman, upon a specific written application from the student, allow the student with the concurrence of the new course instructor to undertake new courses from the list of courses approved by the senate, provided, where applicable, the new course must be from the student's chosen stream of specialization ("Stream Elective").The Course instructor will determine the assignments, examinations, laboratory work, projects or research papers that they have to undertake and the time period over which the deficient student have to complete the tasks as assigned by the course instructor. Based on the work and an examination of student's performance the course instructor will assign him/her a letter grade at the end of the study period. If the grade thus obtained by the student is better than the grade obtained in the earlier course, the course shall be substituted and grade obtained shall be indicated and the new CGPA calculated. The earlier course and the grade obtained shall be indicated in the grade sheet, with a remark that this course was substituted with another course and grade improved. The courses declared as core or mandatory cannot be substituted

8. This facility for improving grades shall be available only to those students whose CGPA is less than 2.40 at some time during their study, and may be availed for a maximum of twelve courses in all and for no more than two courses in any one semester.

9. The deficient students, who have improved their grades in the aforesaid manner, will not be considered for award of any medal, certificate, honour, or fellowship of institute

10. The grade S or X shall be awarded for iMTech internship/ thesis.

5.2.1 Computation of SGPA and CGPA

The **SGPA** (**Semester Grade Point Average)** is an indicator of the overall academic performance of a student in all the courses he/she has registered in during a given semester. It is computed as follows: If the grade points awarded to a student are G_1, G_2, etc in courses with corresponding credits U_1, U_2, etc, the SGPA is given by

$$SGPA = (U_1G_1 + U_2G_2 + ...) / (U_1 + U_2 + ...)$$

In the above computation, courses with S and X grades are ignored. Similarly, the **CGPA (Cumulative Grade Point Average)** indicates the cumulative academic performance in all the courses taken up to the time of computation.

5.3 Academic Performance Requirement

1. The minimum CGPA requirement for continuing in the iMTech program or for graduation is 2.4.

2. In the first two semesters in which the student registers, the minimum CGPA (SGPA) may be relaxed to 2.0 with the approval of the Senate.

3. If a student secures a CGPA less than 2.40 he/she may be allowed to continue in the following semester on the recommendation of the senate. When such permission is granted, he/she will have to improve his/her performance as indicated in section 6.2.5

4. A student will normally not be allowed to continue in the program if

   a. His/her CGPA is below 2.4.

b. He/she obtains Fs or Ds in six courses or three Fs and three D in the same or different semesters.

5. However the senate can permit a student to continue on probation for two more semesters and at the end of the probation period, if the student fails to obtain a CGPA of 2.4 or above, he/she will not be allowed to continue in the programme.

6 INTERNSHIP, THESIS AND THESIS EXAMINATION

6.1 Internship

A student is mandated to carry out a project work as an intern in an organization, approved for this purpose by the Senate, during the summer terms/terms specified for this purpose in the course manual. The organization hosting an intern, shall appoint a supervisor to supervise the work of the student. The supervisor will provide feedback on the progress of the student. The organization will provide a certificate, in a format as specified by the Senate, on the satisfactory completion of the internship. In addition the student will submit to the institute a report in a format specified by the senate.

A student is mandated to carry out a thesis work under the supervision of a faculty of the Institute during the ninth and tenth semesters of the programme.

6.2 Appointment of Thesis Supervisors

1. An iMTech student shall not normally have more than two supervisors at any given time.

2. Thesis supervisor(s) of a student will normally be appointed from amongst the faculty members at IIITB.

3. Under exceptional circumstances, experts from outside can be appointed as co-supervisors of students with the approval of the Senate. One such co-supervisor can be appointed to only one student at a time.

4. If a student's supervisor proceeds on long leave, the Senate shall appoint a supervisor or a co-supervisor in consultation with the supervisor and the student. In this case the number of supervisors may be more than two if an external supervisor already exists.

5. If all research work and related analysis is complete except writing of the thesis, and the supervisor proposes to go on leave, the SENATE may appoint a program coordinator

6. In case a supervisor resigns/retires or otherwise ceases to be a faculty member of the institute, the Senate will appoint a new supervisor or co-supervisor.

6.3 iMTech Thesis Oral Examination Committee

1. The thesis shall be examined by an oral examination committee formed by the thesis supervisor (s) / programme coordinator.

2. The committee shall consist of the thesis supervisor(s)/ program coordinator and two other members of the faculty. The thesis supervisor/program coordinator will act as the Convener of the Committee.

6.4 Submission of Thesis

After the oral examination committee has been constituted, unbound copies of the thesis, one for each examiner of the oral examination committee, prepared according to the format prescribed in the pamphlet entitled: ***Specification and Information Regarding the Preparation of Thesis***, shall be submitted at least two weeks before the probable date of oral examination. Two copies of the abstract (approximately 250 words) should also be submitted along with the thesis report.

6.5 Processing of Thesis

6.5.1 Oral Examination

1. Oral examination shall be conducted at the earliest but not later than one month from the date of submission of the thesis. If a student does not appear in the oral examination within this time period, his/her program would be deemed to have been terminated. Request for reinstatement in the program by such a student should be addressed to the Chairman, Senate. The request may be considered by the Senate and in case the Senate grants the request it shall specify the requirements that the student must fulfil for the award of the degree.

2. The thesis supervisor/program coordinator will intimate the date of the oral examination.

3. The oral examination committee will evaluate the thesis, conduct the oral examination and send a report of the examination to the Chairman of Senate.

4. A thesis shall be considered to have been accepted if all members of the oral examination committee recommend its acceptance. A thesis, which is not accepted, shall be considered to have been rejected.

5. If a thesis is rejected along with a recommendation for resubmission after incorporating any modification/correction suggested by the oral examination committee, oral examination of the re-submitted thesis shall be conducted by the original committee unless a different committee is approved by the Chairman, Senate. If the re-submitted thesis is rejected, the matter shall be reported to the Senate for appropriate action.

6. Acceptance of thesis shall be reported to the Senate for approval.

7   GRADUATION REQUIREMENTS

A student shall be deemed to have completed the graduation requirements, if the student has

- passed all the prescribed courses

- attained the minimum required CGPA

- Satisfied the minimum academic and residence requirements

- Completed internship with a satisfactory grade

- His/her thesis has been accepted by the oral examination committee

- Satisfied all the requirements specified by the Senate and the Ordinances

- Satisfied the attendance requirements as specified by the Senate.

In addition, the student should have paid all the dues to the Institute and, should have no pending case of indiscipline.

8 Award of Degrees

The names of the students who have completed all the graduation requirements shall be submitted to a Senate Meeting to be held preceding to the Convocation. The Senate will recommend to the Governing Body of the Institute admission of such students who have been found suitable to the degrees of Bachelor of Technology (Information Technology) and Master of Technology (Information Technology) of the Institute. On such recommendation the Institute will issue provisional certificates to the student, mentioning admission of the student to the respective degrees. The student shall be formally admitted to the degrees (B.Tech. and M.Tech.) at the Convocation to be held after the Senate meeting in which admission of the student to the said degrees was recommended.