Post Graduate Manual

M.Tech. Programme

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY, BANGALORE

Document Control

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1.0	March 2008	Initial baseline. Created from the printed version dated March 2008
1.1	July 15, 2009	a) Inclusion of new curriculum structure b) Corrections to some sections Approved by Senate in its 19th Meeting held on 25th June 2010
1.2	Dec 03, 2012	Incorporation of changes suggested in 30th Meeting of the Senate of IIITB, held on October 10, 2012
1.3	May 09, 2013	Incorporation of changes from the M.Tech. Curriculum Review Committee 2012 report as approved by the senate. Approved by Senate in the 34th Meeting held on 26th June, 2013
2.0	February 26, 2016	Incorporation of changes suggested by M.Tech. Curriculum Review Committee 2015 report. The report was approved in the 49th Meeting of the Senate on February 15, 2016.

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1 INTRODUCTION

The goal of post graduate programmes at IIIT-B is to develop professionals of high quality to cater to the needs of industry and academia. Such education will be 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 programmes 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 programmes

1. Integrated M.Tech. (iMTech)
2. Master of Technology (M.Tech.)
3. Master of Science by Research (M.S. Research)
4. Master of Science (Digital Society)
5. Doctor of Philosophy (Ph.D.)
6. Other programmes as may be approved by the Senate from time to time

Since 2014, two M.Tech. degrees are being offered – M.Tech (Information Technology) and M.Tech (Electronics System Design). This manual provides details about the Master of Technology (M.Tech.) programme as applicable to both the degrees.

M.Tech. programme is a four semester programme. The first three semesters of the programme constitute academic course work. During the fourth semester, a student can either take up an industry internship or academic research at the Institute and continue to write a thesis. The details of the programme are provided next.

2 Admission

2.1 Academic Session

The academic sessions of the Institute is divided into six parts: a preparatory term, four regular semesters, a summer term. Following is the broad session calendar:

Preparatory term	July 2nd Week	3 weeks
First semester	August - November	16 weeks
Second semester	January – April	16 weeks
Third semester	August - November	16 weeks
Fourth semester	January - June	26 weeks

2.2 Calendar

1. The Calendar for admissions for a particular year will be notified by the institute at the beginning of the previous academic year.
2. Admissions to the M.Tech. programme are generally made in the first semester.

2.3 Eligibility for Admission

The eligibility conditions will be decided by the Senate and announced in the website prior to each year's admission.

2.4 Admission to Part-time Programmes

At this time the institute does not offer any part-time M.Tech. programme.

2.5 Admission Procedure

2.5.1 Eligibility

The minimum qualification for admission to the M.Tech. programme at IIITB is a first-class four-year bachelor's degree in engineering (i.e. B.E., B.Tech., or equivalent). First class degree holders in 3-year undergraduate programmes followed by Masters Degree with first class in any of the physical sciences, or an MCA degree with first class, can also apply. Final-year students expecting to graduate by the year of admission may also apply. First class or equivalent is required in 12th (or equivalent) grade as well.

2.5.2 Selection Procedure

Admissions to the M.Tech. programme is on the basis of performance in the GATE examination. GATE scores from the following disciplines will be considered for admission to M.Tech. (IT):

- CS - Computer Science and IT
- EC - Electronics and Communication Engineering
- EE - Electrical Engineering

For M.Tech (ESD), GATE scores from the following disciplines will be considered for admission:

- EC - Electronics and Communication Engineering
- IN – Instrumentation Engineering

2.5.3 International Students

Foreign nationals (FNs) and non-resident Indians (NRIs) are welcome to apply for the M.Tech. programme. Such applicants can apply with valid GRE and TOEFL scores. Only those students whose undergraduate education was in an Anglophone country (i.e. Australia, Canada, New Zealand, Singapore, UK, and the US) are exempt from TOEFL. Shortlisted FNs and NRIs applicants have to go through an online interview.

2.5.4 Working Professionals

Working professionals applying for the M.Tech. programme must get leave for the duration of the M.Tech. programme. Such applicants have to submit a letter, during the admission, from a supervisor or other authorized representative of the employer stating that there is no objection to the applicant's joining IIITB as a student. Working students will also need sponsorship from the employer, or obtain support

from other sources to meet their costs, as scholarships and other financial support are not available to working students.

3 REGISTRATION

3.1 Regular Registration

1. Every student is required to register each semester for the courses that he/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
2. A new entrant to the postgraduate programme who is awaiting the results of the qualifying examination will be allowed to register "provisionally". Provisional candidates are required to complete all the requirements for graduation to the qualifying degree 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 the following semester till they finish their programmes, or submit their thesis in the case of students registered for Thesis. In the latter case, a student who is likely to submit his/her thesis within two weeks from the commencement of classes need not register in that semester. This period will not be extended in any case.
4. In special cases, students who have completed all work related to thesis and are on sanctioned leave may be allowed to submit their thesis without registration during the leave period.

3.2 Late Registration

1. If for any compelling reason like illness, a student is unable to register on the day of registration, he/she will 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 will 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.

3.3 Academic Advising

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

3.4 Semester Load Requirements

For a full time student the minimum semester load is 12 units and the maximum semester load is 20 units.

3.5 Summer Term Registration

Students may optionally register in the summer term for up to a maximum of 9 units.

3.6 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 for core courses.
2. A student may be required to drop a course at any stage if it is determined that he/she does not fulfill 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.

3.7 Change of Registration from M.Tech. Programme to Ph.D. Programme

1. Students registered for the M.Tech programme may be allowed at the beginning of the second/third semester to change their registration to the Ph.D. programme on the recommendation of the Senate.
2. The student must submit his/her Ph.D. thesis within 7 years counted from the date of his/her first registration in the Ph.D. programme.

4 LEAVE RULES

Students may be granted leave on application as per the Senate approved leave rules.

5 PERMISSION TO PROCEED FOR ACADEMIC WORK OUTSIDE IIITB

5.1 Permission to Proceed to Other Academic Institutions as Non-Degree Students

In order to help-students broaden their horizons and enrich their cultural and academic experience, provision to proceed to other academic and research institutions in India or abroad as non degree students is available. Rules and procedures to be followed for availing this provision are as follows:

An M.Tech. student who satisfies the minimum conditions as laid down may proceed to another academic institution in India or abroad with prior permission of the Senate.

6 ACADEMIC REQUIREMENTS

6.1 Minimum Residence, Maximum Duration and Academic Requirements

The following table lists the minimum residence and the maximum duration allowed in the M.Tech. Programme and credit requirements for graduation:

"Course Work" includes only postgraduate course units unless otherwise stated. To satisfy the "Minimum Residence" requirements, registration must be over consecutive semesters; exception will 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) will be calculated on the basis of all courses taken by the student.

Programme	Minimum Total Units	Units Through Course Work (Minimum)	Units Through Research/Internship (Minimum)	Minimum Residence	Maximum Duration
M.Tech.	64	48	16	2 Years	4 Years

- Courses under preparatory term (‘Prep-term’) are mandatory for all the students.

- Core courses are comprised of 16 credits of which 8 credits are as per the list of courses that will be approved by the Senate from time to time. The remaining 8 credits can be acquired by choosing from a larger set of approved courses (please refer to the M.Tech. Curriculum Document for exact list of courses
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- The total number of credits that can be accumulated through electives is 32 credits. Each elective will be associated with one or more area of specializations with the exception of elective courses from the Information Technology and Society area of specialization, which will be offered as open electives.
- If at least five of the eight electives is from a particular specialization, say Data Science, then M.Tech (IT) with specialization in DS is awarded. The name of the specialization (if any) is noted in the transcript. If these five electives are drawn from various specializations, then MTech (IT) is awarded without any mention of specialization.
- In addition to regular courses, students may take up Project Elective (PE) or Reading Elective (RE) courses. Students may opt for at most three PE or RE during the course of the programme. More information regarding PE/RE is available in Appendix A.
- Industry internship / Research Thesis is mandatory.
- Refer to the M.Tech. Curriculumn Document for the current areas of specializations
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- The overall programme structure will be as per the Course Manual approved by the Senate and being in force on the date of first registration.

6.2 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

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. (Explanation: For example an instructor may choose to use only A, B, C, D and F , and not make use of A-, B+, B-, C+).

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 an F grade must either be repeated or substituted with another course as suggested by the Senate.
4. Grade Improvement Process
    a. 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.

b. They can, improve their grades in courses where they have obtained 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 will be substituted and the new CGPA calculated. The earlier grade obtained will be indicated in the grade sheet, with a remark that this course was repeated and grade improved.

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

d. In case the course instructor is not available, the Senate Chairman, upon a specific written application from the student, can 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 area of specialization ("Area Elective").

e. 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.

f. If the grade thus obtained by the student is better than the grade obtained in the earlier course, the course will be substituted and grade obtained will be indicated and the new CGPA calculated. The earlier course and the grade obtained will 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 can not be substituted.

g. This facility for improving grades will 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 four courses in all and for no more than two courses in any one semester.

h. 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

5. The grade S or X will be awarded for M.Tech. internship/project / thesis:

6.2.1 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 G1, G2, etc in courses with corresponding units U1, U2, etc, the SGPA is given by

SGPA = (U1G1 + U2G2 + ...) / (U1 + U2 +…)

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.

6.3 Academic Performance Requirement

1. The minimum CGPA requirement for continuing in the M Tech programme or for graduation is 2.4.
2. 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 per the Grade Improvement Process.
3. A student must repeat the current academic year if his / her CGPA is below 2.0 at any time during their study.

7 INTERNSHIP, THESIS AND THESIS EXAMINATION

7.1 Internship

A student may opt either for carrying out a project work as an intern or carry out thesis work. The students can do internship in an organization (either industry or an academic institution), approved for this purpose by the Senate. In case the student wishes to carry out a thesis work, it must be under the supervision of a faculty of the Institute. 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, twice during the internship period. 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.

7.2 Appointment of Thesis Supervisors

1. An M.Tech. student who opts for research work 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 M Tech 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 programme 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.

7.3 M.Tech Thesis / Project Oral Examination Committee

1. There should be an M.Tech. thesis committee comprising of the supervisor and at least two more faculty members.
2. Members of this thesis committee will serve as thesis and oral examiners for each student pursuing thesis.

3. The thesis supervisor/programme coordinator will act as the Convener of the Committee.

7.4 Submission of Thesis

After the oral examination committee has been constituted, unbound copies of the thesis or project report, 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***, will be submitted at least a week before the probable date of oral examination. Two copies of the abstract (approximately 250 words) should also be submitted along with the thesis report.

7.5 Processing of Thesis

7.5.1 Oral Examination

1. Oral examination will 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 programme would be deemed to have been terminated. Request for reinstatement in the programme 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 fulfill for the award of the degree.
2. The thesis supervisor/programme 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 will be considered to have been accepted if all members of the oral examination committee recommend its acceptance. A thesis, which is not accepted, will 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 will 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 will be reported to the Senate for appropriate action.
6. Acceptance of thesis will be reported to the Senate for approval.

8 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 or his/her thesis has been accepted by the oral examination committee
- Satisfied all the requirements specified by the Senate and the Ordinances

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

9 APPENDIX I – Special Course Types

Project Elective

Course Code	XX 290 / XX 390
Course Name	Project Elective
Course Description	Students can register for Project Elective for working on a focused software development or a research project with specific deliverables under the supervision of a faculty member.
Grading Scheme	4-point scale (A, A-, B+, B, B-, C+, C, D, F)
Credits	• 4 units during Term I and Term II • 3 units during Summer
Remarks	• XX 290 will be used for M.Tech, • This course is NOT available for MS by Research / PhD students • Students may take not more than ONE project elective course per semester within the permissible semester load requirements. • Depending upon the nature of the project, XX to be replaced with one of (CS, DS, NCE, SE). A prefix of IT may be used if the project elective does not fit into any of the existing areas of specialization as determined by the faculty supervisor.

Reading Elective

Course Code	XX 295 / XX 395
Course Name	Supervised Reading
Course Description	Students can register for Reading for carrying out focused reading on a give topic under the supervision of a faculty member.
Grading Scheme	4-point scale (A, A-, B+, B, B-, C+, C, D, F)
Credits	• 4 units during Term I and Term II • 3 units during Summer
Remarks	• XX 295 will be used for M.Tech, • XX 395 will be used for MS / PhD students • Students may take not more than ONE reading elective course per semester within the permissible semester load requirements. • Depending upon the subject on which the reading is prescribed, XX to be replaced with one of (CS,DS,NCE,SE). A prefix of IT may be used if the reading does not fit into any of the existing areas of specialization as determined by the faculty supervisor.

Thesis

Course Code	IT 299 / IT 399
Course Name	Thesis
Course Description	This course is intended for M.Tech. thesis students and MS/PhD students who have to earn the requisite number of research units in addition to course work. Students need not have begun writing their thesis for registering in this course.
Grading Scheme	S (Satisfactory) or X (Unsatisfactory) A single letter grade for the entire set of registered units for a term instead of SSSS, SSSX, etc. as currently mentioned in the manual.
Credits	• Multiples of 4 units during Term I and Term II • Multiples of 3 units during Summer
Remarks	• IT 299 will be used for M.Tech. students • IT 399 will be used for MS by Research and PhD students • Semester load requirements determine the number of units a student can register for in a given term.

Internship

Course Code	IT 298
Course Name	Internship
Course Description	Students register in this course at the time of doing internship
Grading Scheme	S (Satisfactory) or X (Unsatisfactory)
Credits	• Multiple of 4 units • Multiple of 3 units during Summer • Semester load requirements determine the number of units a student can register for in a given term. M.Tech. students require total of16 units to graduate.
Remarks	• Intended for M.Tech. students only