

CHAPTER XXXVI(F)
MASTER OF TECHNOLOGY (M.TECH.)
EFFECTIVE FROM SESSION 2019-20

1. Introduction

- (a) The Faculty of Engineering & Technology, Aligarh Muslim University offers full-time program leading to the Master of Technology (M. Tech.) degree in Chemical Engineering, Civil Engineering, Computer Science and Engineering, Electrical Engineering, Electronics Engineering, Mechanical Engineering, Petroleum Processing and Petrochemical Engineering, and Nanotechnology, with further specializations, if any.
- (b) The medium of instruction in M. Tech. Program is English.

2. Eligibility

A candidate will be eligible for admission to M. Tech. program if he/she has obtained the Bachelor of Technology degree or its equivalent recognized by the University in the relevant branch of engineering with not less than 60% marks in the aggregate or its equivalent CPI/CGPA/NAG etc. For M. Tech. program in Nanotechnology, candidates who have obtained B.Tech. or its equivalent degree in any branch of Engineering or Master of Science degree in Physics/Chemistry/Life with not less than 60% marks in the aggregate or its equivalent CPI/CGPA/NAG etc. will also be eligible. All eligibility requirements are subject to such other conditions as laid down by the University from time to time.

3. Admission

- (a) The admissions to the M. Tech. programs will be made normally in the beginning of an academic session as per the admission policy approved by the Academic Council of the University from time to time. The admission of each student will be made in a particular **specialization**.
- (b) The admission of a candidate will be made either as a full-time student or as a part-time student.
- (c) Local professionally employed personnel in Govt./Semi_Govt./ Public Sector undertaking may be admitted as part-time students to the M. Tech. program in the relevant branch. Such admissions will be over and above the sanctioned intake.
- (d) Sponsored candidates from Govt./Semi_Govt./Public Sector undertaking may be admitted as full-time students over and above the sanctioned intake. Such students shall have to pay additional development charges as decided by the university from time to time.

4. Academic Session

The academic session is divided into two regular semesters - Odd and Even, each of which shall be of approximately 20 weeks duration. The Odd semester will normally commence in the month of July/August every year, and the Even in the month of December/January. In the beginning of every session the Dean, in consultation with the Chairmen of the departments concerned, shall notify a detailed academic calendar indicating the schedule of teaching, examination, and other activities.

5. Duration of the Program

5.1 Minimum Duration

The minimum duration of the program for a full-time student shall be four consecutive semesters after admission. The minimum duration of the program for a part-time student shall be six consecutive semesters after admission.

5.2 Maximum Duration

The maximum duration of the program for a full-time student shall be eight consecutive semesters after admission. The maximum duration of the program for a part-time student shall be ten consecutive semesters after admission.

5.3 Minimum and Maximum Duration in case of change of student status

A full-time student can convert his/her admission to part-time subject to fulfilling the eligibility conditions as provided in these ordinances for part-time students by applying to the Dean of the Faculty through the Chairman of the concerned department. Such conversion will be allowed at the end of a semester only and not in the middle of the semester. The minimum and maximum durations for such a student shall remain same as those for full-time students if such conversion is done after spending two semesters after admission to the program. However, if such conversion is done before spending two semesters after admission, the minimum and maximum durations shall become as specified for part-time students.

6. Curriculum and Credit System

6.1 Credit System

Each M. Tech. program will have a curriculum in which every course will be assigned certain credits reflecting its weight and contact periods per week, as given below:

- 1 Lecture period (L) per week = 1 Credit
- 1 Practical period (P) per week = 1/2 Credit
- 1 General/Tutorial period (T) per week = 1 Credit

In addition to theory and laboratory courses there may be other courses such as seminar, colloquium, project, dissertation etc., which will be assigned credits as per their contribution in the program without regard to contact periods. The general period may be used for lecture, presentation, field work, literature search, discussions, software development, or for such other purposes as may be decided by the teacher(s) concerned.

6.2 Course Categories

The curriculum for each **specialization** will contain courses in the following categories having credits in the ranges given below in such a way that the total of all credits will be equal to that required for the award of degree as specified elsewhere in these ordinances.

Course Categories	Credit Ranges
Engineering Sciences (ES) (Foundation and applied engineering courses that are used across many specializations)	3-8
Program Core (PC)	30-54
Program Electives (PE)	12-32
Open Electives (OE)	3-8
Audit Courses (AU) (Language, Social science, Management, value education, stress management etc.)	0

6.3 Coordinators and Curriculum Development Committee.

There shall be a Chief Coordinator, M.Tech. Programs to be nominated by the Dean, and a Coordinator, M.Tech. Program for each branch in each department, to be nominated by the Chairman of the department concerned. There shall be a Curriculum Development Committee (CDC) in each department and also a central CDC at the Faculty level. The departmental CDC will be constituted by the board of studies of the concerned department. The central CDC will comprise of the following:

1. Senior most Professor of Z.H. College of Engineering & Technology, next to Dean as Chairman
2. Chief Coordinator, M. Tech. Programs, as convener.
3. Chief Tabulator, Z.H. College of Engineering & Technology
4. Coordinators of CDC of each department, as member.
5. Three teachers of Z.H. College of Engineering & Technology, nominated by the Faculty, as member for a period of two years.

6.4 The Curriculum Structure

The curriculum for each specialization will contain a listing of all courses, with each course having a course category, course number, course title, number of contact periods per week, number of credits assigned, pre-requisite course(s) if any, and the marks assigned to various components of evaluation. It will also have a list of alternative courses in the new curriculum for the old curriculum courses and filler courses to compensate for the shortfall in credits earned by taking alternative courses in any category, if needed. It will also specify all other conditions required for the award of degree.

6.5 Approval of the Curriculum

The curriculum for each branch/specialization of M. Tech. program will be prepared by the department concerned and will be approved by the Board of Studies of the department. It will then be vetted by the CDC and will then be placed in the Faculty along with the recommendations of the CDC for approval. Once approved by the Faculty, the Curriculum will be implemented. The same procedure shall be used for any modification in the Curriculum.

7. Registration

- (a) Every student is required to register, for each semester, for the courses that he/she wants to pursue in that semester. The student will have to choose any of the following modes of registration:

Mode	Requirements
a	Fulfil class attendance requirement and appear in all components of evaluation.
b	Appear in all components of evaluation.
c	Appear in end semester exam only. Previous sessional marks will be considered.

Registration in modes 'b' and 'c' will be permissible only if the student had registered in mode 'a' and fulfilled attendance requirement in earlier semester. The registration schedule will be announced by the Dean for every semester. The registration procedure will be notified by the Chief Coordinator, M. Tech. Programs.

- (b) A student will normally register for higher semester courses only if he/she has also registered for un-cleared courses of previous semesters, especially in the case of un-cleared courses of first two semesters.
- (c) A student will have the option to add/delete/alter the courses in his/her registration within a week of the registration subject to such conditions as may be imposed by the department concerned from time to time.
- (d) A student can drop a course from his/her registration by submitting a request to his/her department coordinator up to a date specified on his/her registration card. A registered course will be counted as an attempt even if the student remains absent in the Examination(s).
- (e) No student will be allowed to register for more than 32 credits in a semester. A part-time student can register a maximum of 18 credits.
- (f) A student may be denied registration in a course due to reasons of paucity of staff or space or other facilities, especially in case the student is registering a course for improving the grade in a passed course.
- (g) If a student fails to register in two consecutive semesters without specific permission from the Dean, his/her name may be removed from the rolls of the faculty. Such a student may apply to the Dean for re-admission stating the reasons for not being able to register for two consecutive semesters and the Dean will take suitable decision on the merit of the case.

8. Attendance (In lieu of Chapter XVII of the Academic Ordinances)

Attendance in each course separately is compulsory at least once. Students who have put in 75% or more attendance in a course in a semester will be eligible to appear in the End-Semester Examination of that course. Students who have put in 65% or more but less than 75% attendance in a course may be considered for condonation of shortage of attendance in that course by the condonation committee. Students whose attendance in a course is less than 65% or whose shortage in attendance has not been condoned will not be eligible to appear in the End-Semester Examination of that course and will be awarded grade 'F' in that course and all marks obtained in any component of the course evaluation will stand cancelled. However, in case a student is repeating a course and the student has already fulfilled the attendance requirement in that course, he/she will not be detained due to shortage of attendance in that course during the repeating semester.

9. Examination and Evaluation

9.1 Components of Evaluation

Each course will be evaluated out of 100 marks. The courses will normally have the following components of evaluation:

- (a) Theory courses:

Course work	15 marks
Mid-Semester Examination	25 marks
End-Semester Examination	60 marks

- (b) Laboratory courses including Seminar, Colloquium, Project, dissertation etc.

Course work	60 marks
End-Semester Examination	40 marks

However, for special academic reasons, some courses may have different weight for different components of evaluation from that given above. Such special reasons will be spelt out clearly in the curriculum.

9.2 Grading System

The combined marks obtained by a student in various components of evaluation of a course shall be converted into regular letter grades with their equivalent grade points as specified below

Grade	Grade points	Description
A+	10	Outstanding
A	9	Excellent
B+	8	Very good
B	7	Good
C	6	Average
D	5	Satisfactory
E	0	Unsatisfactory (Fail)
F	0	Detained due to shortage of attendance
I	0	Incomplete/Absent in the End-Semester Examination
Z	0	Cancelled due to other reasons

The following marks ranges may ordinarily be used for the award of grades to the students in a theory course.

Range	Grade
81 and above	A+
71 and above but less than 81	A
61 and above but less than 71	B+
51 and above but less than 61	B
41 and above but less than 51	C
35 and above but less than 41	D (Minimum Pass Grade)
Less than 35	E

For a lab course the grade ranges will be as follows:

Range	Grade
81 and above	A+
71 and above but less than 81	A
61 and above but less than 71	B+
51 and above but less than 61	B (Minimum Pass Grade)
Less than 51	E

Two grace marks may be awarded by the examiner for passing a course and one grace mark may be awarded by the examiner to elevate the grade. Any fraction in any component of evaluation should be rounded off to the next whole number.

The examiner(s) may propose higher or lower grade ranges depending upon the nature of the course and general performance of the students in the course, but the final decision rests with the Result Moderation Committee. However, the minimum passing grade should never be awarded if a student secures below 35 marks (including 2 grace marks) in a theory course and 51 marks (including 2 grace marks) in a lab course.

9.3 Earned Credits (EC)

If a student obtains minimum pass grade in a course, he/she earns the credits assigned to that course.

9.4 Performance Indices

At the end of every semester a student's performance will be indicated by Earned Credits (EC), a Semester Performance Index (SPI), and a Cumulative Performance Index (CPI). The SPI is the credit-weighted average of grade points of all courses registered during a semester and is computed as follows:

$$SPI = (C_1G_1 + C_2G_2 + \dots) / (C_1 + C_2 + \dots)$$

Where C_1, C_2, \dots are the credits assigned to courses and G_1, G_2, \dots are the grade points earned in those courses.

The CPI is the credit-weighted average of grade points of all courses registered since admission. In case a student has registered a course more than once, the best grade will be considered for calculation of CPI.

9.5 Repetition of a Failed Course

If a student registers a course but fails to fulfil attendance requirement, he/she will be required to register the course (or its alternative) again in mode 'a'.

In case the student completes attendance requirement but fails to secure a pass grade in a course, he/she has option of registering the course again either in mode 'b' or in mode 'c'.

9.6 Repetition of a Passed Course

A student may repeat a course to try to improve his/her grade in that course only once, provided that he/she has passed that course in a single attempt. In such case the student will have to register the course again

either in mode 'b' or in mode 'c'. Requirements of mode 'b' and 'c' registrations are same as described in clause 7 (a). For the purpose of calculating the SPI the recently obtained grade will be considered while for CPI the better of the two grades will be counted.

9.7 Conduct of Examinations

- (a) The examiners for the End-Semester Examination of all theory courses will normally be the teacher(s) associated with the course. The Seminar, Colloquium courses will be examined by the teacher(s) associated with the course and one or more examiners from among the teachers of the department to be recommended by the BOS of the department concerned. The laboratory and project courses will be examined by the teachers(s) associated with the course and an external examiner not in the service of the university at the time of examination. In case the external examiner does not turn up for the examination, the Chairman of the department concerned, in consultation with the course incharge, shall call another person to act as the external examiner, even from within the University, if necessary.
- (b) The dissertation will be submitted after all other components of the M. Tech. Program are completed. The dissertation will be examined through an open defense and will be evaluated by the supervisor(s) and an external examiner not in the service of the university at the time of examination.

9.8 Moderation Committees

(a) Question Paper Moderation Committee: There shall be a Moderation Committee of the concerned Department consisting of the following members to moderate the Question Papers of the End- Semester Examination.

- (i) Chairman of the Department concerned - (Convener)
- (ii) One senior teacher of the Department in each broad area of specialization (to be appointed by the BOS).

Note: The Paper Setter(s) may be invited, if necessary, to clarify the necessary details of the question paper.

(b) Result Moderation Committee: There shall be a Result Moderation Committee of the concerned Department consisting of the following members to moderate course-wise results of the End- Semester Examinations.

- (i) Chairman of the Department concerned (Convener).
- (ii) One senior teacher of the Department in each broad area of specialization (to be appointed by the BOS).
- (iii) Examiner(s) concerned.

The Result Moderation Committee will examine the result of each course and in case of an abnormal situation; it may take suitable corrective measures in consultation with the examiner(s).

10. Degree Requirement

- (a) A student who earns 72 credits and fulfills such other conditions as may be mentioned in the curriculum will be awarded the degree of Master of Technology. He/she must also pay all University dues as per rules. Moreover, there should be no case of indiscipline pending against him/her.
- (b) If a student earns more credits than the minimum required for the award of degree, his/her CPI will be calculated by considering the best grades subject to fulfilling the criteria of required credits as specified in the curriculum.

11. Promotion, Name Removal from the Rolls of the University and Mercy Appeal

11.1 Promotion and Name Removal

The earned credits (EC) of every student will be checked at the end of II semester. The difference between the credits that a student is required to earn by the end of a semester (as per the curriculum) and actual credits earned by the student will be counted as total uncleared credits. The student will be promoted to III semester if the total uncleared credits is less than or equal to 22, otherwise his/her result will be declared as "Fail". If a student gets "Fail" result more than twice, his/her admission to the M. Tech. program will be cancelled and his/her name will be removed from the rolls of the University.

11.2 Mercy Appeal

If the name of a student is removed from the rolls of the University as per provisions of clause 11.1 of these ordinances, he/she may appeal to the Vice-Chancellor stating the reasons for not being able to earn the required credits and the Vice-Chancellor, if he is satisfied with the reasons, may allow the continuation of admission of the student only once during the tenure of the program, extending the total duration of the program by one year, at the maximum, if required. Under any circumstances no full-time student will be allowed to complete the program after the lapse of 10 semesters after admission; and no part-time student will be allowed to complete the program after the lapse of 12 semesters after admission.

12. Result

- (a) If a student passes all the examinations and fulfils all the requirements for the award of degree his/her result will be shown as "Graduated".
- (b) The Division awarded to "Graduated" students will be based on CPI as given below:

First Division (Honours)	CPI \geq 8.5
First Division	$6.5 \leq$ CPI $<$ 8.5
Second Division	CPI $<$ 6.5
- (c) At the end of each semester the CPI obtained by the student can be converted into equivalent percentage of marks by the following formula:
Equivalent Percentage = 10*CPI
- (d) At the end of Odd semester examination, result of the students will be declared as "Continued". At the end of II semester the result will be as follows:
PASS- if the total uncleared credits is zero
PROMOTED-if total uncleared credits greater than zero but less than or equal to 22.
FAIL- if total uncleared credits is more than 22.
- (e) At the end of IV Semester, if the student fulfils all the conditions for graduation, his/her result will be declared as "GRADUATED", otherwise his/her result will be declared as "FAIL".
- (f) If the name of a student is removed from the rolls of the University as per provisions of clause 11.1 of these ordinances his/her result will be shown as "Name Removed".
- (g) Only full-time regular students admitted to a course of study fulfilling the following conditions will be eligible for ranks/positions:
 - (i) They do not have any break in their studies;
 - (ii) They have passed every scheduled paper in first attempt on time as per the curriculum;
 - (iii) They do not sit for improvement in any paper after passing it;
 - (iv) They complete all requirements for award of degree (including viva-voce of dissertation/project etc.) by a date determined as 14 days after start of the next academic session/semester.
 - (v) They have not been found guilty of any misconduct as per Student's Conduct and Discipline Rules of the University.

The students who violate any of the above conditions will not be awarded any rank/positions for the course of study.

13. Transitory Clause

Candidates admitted prior to the implementation of these Ordinances shall be governed by the Ordinances (Academic) under which they were admitted. Students who fail in the courses that are no more offered in these new ordinances and new curriculum will be allowed to pass the alternative courses, and in case there are no alternative courses, the old courses may be offered. For such candidates, any marks obtained earlier shall not be taken into account for passing the course(s) and they will have to obtain marks in all components of evaluation afresh. A student admitted previously may apply to the Dean through the Chairman concerned, to be governed by these ordinances. Such cases may be allowed on a case to case basis.

Regulations of Chapter XXXVI(F) of Ordinances (Academic)
Master of Technology (M.Tech.)
Effective from session 2019-20

1. Explanations

1.1 Course Number:

Every course will have a course number consisting of 7 characters. The first two characters will be alphabets indicating the department that offers or coordinates the course; the third character will be an alphabet indicating the course category, the fourth character will be a numerical digit indicating the year of offering the course in the program; the fifth to seventh characters will be numerical digits that describes the course.

(a) The first two alpha characters will mean the following:

AC = Department of Applied Chemistry

AM = Department of Applied Mathematics

AP = Department of Applied Physics

AR = Department of Architecture

CE = Department of Civil Engineering

CH = Department of Chemical Engineering

CO = Department of Computer Engineering

EE = Department of Electrical Engineering

EL = Department of Electronics Engineering

ME = Department of Mechanical Engineering

PK = Department of Petroleum Studies

EZ = Not belonging to any department Z.H. College of Engineering & Technology

(b) The third alpha characters will mean the following:

C: Program Core (PC); E: Program Elective (PE); O: Open Elective (OE); A: Audit courses (AU)

S: Engineering Sciences (ES)

(c) The fourth character 6 for First Year and 7 for Second Year of the M. Tech. program.

(d) The fifth and sixth characters will be interpreted as follows:

01 to 79 : Theory Courses

80-89: Courses such as Seminar, Colloquium, Field Work etc

90-99: Laboratory/Practical courses, Projects, and Dissertation.

(e) The seventh character will be a numerical digit between 0 and 9, indicating version of the course. It will be updated after every revision.

1.2 Faculty Number

Every student has a Faculty number consisting of 9 characters. The first two characters are numerical digits indicating the year of admission; the third and fourth characters are alphabets indicating the branch of the M. Tech. program; the fifth character is an alphabet indicating the specialization; the sixth character is always "M" indicating M. Tech. program; the seventh, eighth and ninth characters are numerical digits that are for identifying a student of a particular batch.

(a) The first two characters will be the right most two digits of the year of admission. Thus students admitted in 2018 will have the first two characters as 18.

(b) third and fourth characters will be interpreted as follows:

AP = Applied Physics

CE = Civil Engineering

EE = Electrical Engineering

CH = Chemical Engineering

EL = Electronics Engineering

ME = Mechanical Engineering

CO = Computer Engineering

PK = Petroleum Processing & Petrochemical Engineering

NT = Interdisciplinary Nanotechnology

1.3 Marks

- (a) The combined total marks obtained by a student in the course work and the mid-semester examination will be called Sessional Marks.
- (b) The marks obtained by a student in the end-semester examination will be called Examination Marks.

2. Curriculum

Curriculum of each M.Tech. programme will be based on the following guidelines:

- (a) Theory courses can be either of 3 or 4 credits.
- (b) Curriculum should have at least two laboratory courses, each of 2 credits within first two semesters.
- (c) Curriculum should contain one Audit course of two periods per week.
- (d) Second semester must have a project of 3-4 credits.
- (e) Third semester should have dissertation. It may also have few elective courses and an audit course.
- (f) Fourth semester should have only pre-dissertation seminar carrying 2 credits and dissertation.
- (g) Dissertation should have two phases; spread over third and fourth semesters. The total credits allocated to dissertation should be in the range of 20-24, out of which at least 65% weightage should be given to phase-II.
- (h) Dissertation work can be done in the concerned department and/or any other department/institute/industry permitted by the department on the recommendation of the supervisor.

3. Conduct of Teaching

3.1 Course In-charge

Every course will be taught by one or more teachers. The BOS of the concerned department will allocate the teaching load to the teacher(s) and will also designate a course in-charge for each course. If more than one department is involved in the teaching of the course, the course in-charge will be from the coordinating department. The course in-charge will coordinate all the work related to attendance, course work, examination and evaluation. It is necessary that the students are informed about the course in-charge so that they may contact him/her about any problems regarding the course.

3.2 Display of Attendance, Marks etc.

It is essential that the attendance should be displayed to the students twice in a semester, once in the middle and then at the end of a semester by the teacher(s) concerned. The mid-semester marks should be displayed to students normally within 15 days of the examination. The total Sessional marks should be displayed to the students before the beginning of the end-semester examinations. The course in-charge will ensure that the teachers associated with the course make such displays and, in case of complaints from the students in this regard, shall inform the Chairman of the concerned department about the problem.

3.3 Offering Courses

- (a) Courses will be offered by the department concerned as per the schedule given in the relevant Curriculum. Departments may also offer a course in both the semesters even though it may be shown in a particular semester.
- (b) Program Elective (PE) courses will be offered depending on the availability of the staff and other facilities and therefore any particular elective course may not be offered even though it may exist in the list of possible elective courses.
- (c) The advisement for Open Elective (OE) courses in various departments will be based on the guidelines approved by the respective Board of Studies.

3.4 Syllabus

Each course will have a syllabus and a teaching schedule which will be made available to the students. The syllabus should include course objectives, course outcomes and pre-requisite courses (if any). The teacher(s) concerned should ensure that some portion, beyond the syllabus, should also be covered in the class.

4. Correction of Errors

In case any error is detected in the marks recorded on the award list, the examiner(s) concerned shall make a request to correct the mistake to the Dean, Faculty of Engg. & Tech. through the Chairman of the

concerned department, and shall attach relevant documentary evidence. A committee consisting of the following members shall take suitable remedial measures depending upon the merit of the case.

1. Dean, Faculty of Engg. & Tech. (Chairman)
2. Principal, ZH College of Engg. & Tech.
3. Chairman of the concerned department.
4. One senior member of the Faculty to be nominated by the Dean.
5. Chief Tabulator, M. Tech. Program.

5. Examinations

5.1 Mid-Semester Examination

Mid-semester examination(s) of each theory course will be of one-hour duration and will be conducted as per norms and schedule notified by the office of the Dean in each semester. There will be no mid-semester examination of laboratory/seminar/field-work courses. However, there will be a mid-term evaluation of project and dissertation courses.

5.2 End-Semester Examination

End-semester examination(s) of each theory course shall be of two hours duration and will be conducted as per norms and schedule notified by the Controller of Examination of the University on the advice of the Dean. The end-semester examinations of laboratory/practical courses, and other courses such as seminar, colloquium, field work, project, dissertation etc. shall be conducted as notified by the Dean/Chairman concerned.

5.3 Make-up Test

Students who miss the Mid-Semester Examination in a course due to illness or some other extra-ordinary compelling situation may contact the teacher(s) concerned of the course with the request to conduct a make-up test. The teacher(s) shall follow the guidelines in this regard approved by the Faculty from time to time. There shall be no make-up test/examination for end-semester examinations.

6. Submission of Dissertation

A student can submit his/her dissertation only after he/she has obtained pass grades in all the other courses. Dissertation can be submitted at least 16 weeks after the beginning of semester in which the student has registered for dissertation and not later than 2 weeks after beginning of the next semester. If a student fails to submit his/her dissertation within aforementioned period his/her result will be declared as "Continued" and he/she will be required to register the dissertation again in the next semester. Following guidelines will be followed for submission of dissertation:

- (a) The dissertation/thesis shall be typed in English language using 12 font-size with 1.5-line spacing in 'New Times Roman' with the following margins: 1.5" on left side, 1" on right side and 1" each on top and bottom.
- (b) The dissertation/thesis should be printed on good quality A4 size paper on both sides.
- (c) The dissertation shall include the following:
 - i. Self-declaration certificate from the candidate and certificate from the supervisor and co-supervisor (if any)
 - ii. Details of the paper(s) published / accepted for publication/ communicated (if any).
- (d) The student shall submit required number of copies (one for each examiner, one for departmental seminar, one for University Library and one additional copy) of the Dissertation, duly forwarded by Supervisor and Co-supervisor, if any, along with the prescribed proforma in the office of the Chairman who shall forward it to the Controller of Exams through the Dean Faculty of Engineering & Technology.