M. Tech. 2022

Guidelines Curriculum and Regulations

APJ Abdul Kalam Technological University

Published by

APJ Abdul Kalam Technological University

For private circulation only

CONTENTS

DEFINITIONS

'Act'	means APJ Abdul Kalam Technological University Act, 2015 (17 of 2015)
'Academic Calendar'	means the schedule of commencement and culmination of classes and events for M. Tech programme started every academic year and declared by the University by order issued from time to time.
'Academic Year'	means the academic year consisting of two consecutive (one odd + one even) semesters.
'AICTE'	means the All India Council for Technical Education constituted under the All India Council for Technical Education ACT 1987.
'BoG'	means the Board of Governors of the University.
'BoS'	means the Board of Studies constituted by the University in accordance with Act and First Statutes of the University.
'CGPA'	means Cumulative Grade Point Average.
'CIA'	means Continuous Internal Assessment which is assessed for every student for every course during the semester.
'Course'	means a theory / dissertation / miniproject / practical subject that is normally studied included in the curriculum.
'Discipline'	means the branch of M. Tech Degree Programme or the broad branch of engineering. Example: Civil Engineering, Mechanical Engineering etc.
'**ESE'**	means the End Semester Examination which is conducted by the University/Institute at the End of the Semester for all the courses of that semester as per the curriculum.

'First Statutes' means the APJ Abdul Kalam Technological University First Statues, 2020

'Grade Card' means the certificate issued to each candidate generally containing course type, course code, course title, grade, credit values and grade points along with SGPA of that semester/CGPA of the Programme.

'Private Candidate' means a student who has not completed the M. Tech programme within the stipulated duration of the programme but permitted to appear in the End Semester Examination of the programme.

'Programme' means the combination of courses and/or requirements to be completed that lead to a degree or certificate. Example, M.Tech in Information Security, M.Tech in Construction Management etc.

'M. Tech Degree Programme' means a programme leading to the award of a Masters Degree by the University.

'SGPA' means the Semester Grade Point Average.

'Stream' means two or more similar M.Tech Programmes.

'Supervisor' means the person who supervises the work and mentors/advises the student in his Dissertation/Research Project work.

'UGC' means the University Grants Commission constituted under the University Grants Commission Act 1956.

'University' means the APJ Abdul Kalam Technological University (APJAKTU) established by the Act.

1. PREAMBLE

R1.1 These regulations are applicable to all M.Tech (Regular) Degree Programmes conducted in colleges affiliated to the APJAKTU from the Academic Year 2022-23 onwards.

R1.2 The provisions contained in these regulations shall govern the policies and procedures on the admission and registration of students, imparting instructions of course, conduct of the examination, evaluation, certification of students performance leading to the award of M. Tech Degree Programme(s).

R1.3 These regulations for the M.Tech Degree Programmes along with all the amendments thereto, and shall be binding on all students undergoing the said M.Tech Degree Programme(s) conducted in colleges affiliated to the APJAKTU from the Academic Year 2022-23 onwards.

R1.4 These regulations, as amended from time to time shall be binding on all parties concerned, including the Students, Faculty, Staff, affiliated colleges and the University.

R1.5 In all matters related to the interpretation of the provisions in these Regulations, the decision of the BoG of the University shall be final.

2. ELIGIBILITY OF ADMISSION

R2.1 The candidates shall be an Indian National.

R2.2 The candidate should have B.Tech. Degree in the appropriate branch of APJ Abdul Kalam Technological University or bachelor's degree in Engineering from another University approved by AICTE/UGC approved Deemed Universities in India and recognized to be eligible for higher studies by APJAKTU.

R2.3 In case of candidates who have an Under Graduate Degree in Engineering from foreign universities, an eligibility certificate from APJ Abdul Kalam Technological University is to be produced.

R2.4 The candidate should have a minimum CGPA of 6.0 in a 10 point scale in the Engineering Degree Examination. For SEBC (OBC) students, the minimum CGPA requirement is 5.5 in a 10 point scale. Wherever the credit system is/was followed, only CGPA will be considered for selection. If the candidate has obtained the bachelor's degree in Engineering from a University where credit system is/was not followed, he/she should have a minimum of 60% aggregate marks (For SEBC /OBC students, a minimum of 55% aggregate marks in the Engineering Degree examination is mandatory). For SC/ST candidates a pass in the Engineering Degree Programme is sufficient.

R2.5 In case the CGPA by any University is mentioned on a scale other than 10 point, then the corresponding CGPA will be proportionally scaled to 10 point scale.

R2.6 Candidates, who have passed AMIE / AMIETE Examinations and satisfying the following conditions, are also eligible for admission. i) They must have valid GATE score. ii) A minimum of 55% marks for section B in AMIE/AMIETE examination.

R2.7 Sponsored candidates from Industries, R&D organizations, National Laboratories as well as Educational Institutions, with a bachelor's degree in Engineering are eligible for admission to the M.Tech Programme.

R2.8 Candidate for sponsored quota must have a minimum experience of three years in the relevant field and must be sponsored by University or Industry/Teaching/Research Organizations of Centre/State Government/Private or by Private Engineering Colleges approved by AICTE. A special fee will be levied on the sponsored candidates. Such candidates may opt for admission into a programme recommended by the sponsoring institute/organization.

R2.9 Admission shall normally be restricted to those with valid GATE score. However, this stipulation is relaxed in the case of sponsored candidates. In case seats remain vacant due to lack of candidates with valid GATE score, candidates without valid GATE score shall be considered. Admission to such seats will be made on the basis of their CGPA/% marks scored in their Engineering Degree.

R2.10 The reservation policy of the Government of Kerala shall be followed in admission to the M. Tech. programme.

R2.11 Notwithstanding all that is stated above; the admission policy may be modified from time to time by the University, particularly to confirm to the directions from the Government of Kerala/Government of India/AICTE as the case may be.

R2.12 The maximum number of seats under various categories (regular, sponsored candidates and SC/ST) shall be as per the intake as approved by the AICTE, State Government and APJAKTU.

R2.13 If at any time after admission, a candidate is found not fulfilled any of the requirements stipulated by the University or the statutory body concerned, the University may revoke the admission of the candidate and report the matter to the BoG for ratification.

3.0 STRUCTURE OF THE M. TECH PROGRAMME

R3.1 All the M. Tech programmes will be structured on a credit based system following the semester pattern having continuous evaluation.

R3.2 Every M.Tech Programme shall have a curriculum and syllabi approved by the Academic Council. Syllabus for any course can be modified/updated by the Academic Council upon the recommendations of the Board of Studies. All revisions shall be only based on the recommendations of the Board of Studies.

R3.3 The programme shall span four semesters. First and second semester shall have a minimum of 75 instruction days followed by the end semester examination. Third semester shall have a minimum of 60 instruction days followed by the end semester examination. Fourth semester shall have a minimum of 90 instruction days followed by the end semester examination. The total contact hours shall normally be 29 hours per week including teaching assistance.

R3.4 Duration of the Programme: The minimum duration of M. Tech programme will normally be two years consisting of four semesters. The maximum

duration which a student can take to complete a programme shall be as follows:

Maximum duration = N+2 years, where N stands for the minimum duration (In Years) prescribed for completion of the programme. Under exceptional circumstance, a further extension of one more year may be granted subject to approval of the Syndicate for the requisition made by the student. The request made by the student for duration extension shall be recommended by the Principal with valid justification. During the extended period (beyond maximum duration) the student shall be considered as a private candidate and not eligible for first class.

R3.5 The academic work in each semester shall consist of course work, miniproject, lab and/or dissertation work as specified for each programme. The curriculum is so drawn up that the minimum number of credits for successful completion of the M. Tech programme of any specialisation is 68. Each programme will consist of

- Core courses (Discipline core courses and Programme core courses)
- Elective courses (Programme electives and Interdisciplinary electives)
- Audit course
- Research Methodology & IPR
- Miniproject
- Laboratory work
- Dissertation/Research work

R3.6 Every Course comprises of specific Lecture-Tutorial–Practical (L-T-P) schedule. The course credits are fixed based on the following norms: (i) Lectures/Tutorials: 1 hour per week is assigned one credit (ii) Practical/Project: 2 hour per week is assigned one credit (iii) Dissertation/Research Project: 1.5 hour per week is assigned one credit. The distribution of credits for the course work is given in Table 1.

Table 1: Distribution of credits among the Semesters

Sem	Course work content	Total credits allotted	Credits allotted semester-wise
I	Core courses: 3 nos	3x3 = 9	18
	Programme electives: 2 nos	2x3 = 6	
	Laboratory: 1 no	1x1 = 1	
	Research Methodology & IPR: 1 no	1x2 = 2	
II	Core courses: 3 nos	3x3 = 9	18
	Programme electives: 2 nos	2x3 = 6	
	Laboratory: 1 no	1x1 = 1	
	Miniproject: 1 no	1x2 = 2	
III	MOOC: 1 no	1x2 = 2	16
	Internship: 1 no	1x3 = 3	
	Audit course: 1 no	No credit	
	Phase 1: Dissertation/Research Project: 1 no	1x11 = 11	
IV	Phase 2: Dissertation/Research Project: 1 no	1x16 = 16	16
Total credits in all four semesters			**68**

R3.7 Nomenclature of Programmes: The nomenclature and its abbreviation given below shall be used for the degree programmes under the University. Master of Technology shall be abbreviated as M.Tech. Examples:

- Postgraduate (PG) engineering degree academic programme in Structural Engineering shall be mentioned as Master of Technology (M.Tech.) in Structural Engineering (Discipline: Civil Engineering).
- Postgraduate (PG) engineering degree academic programme in Artificial Intelligence shall be mentioned as Master of Technology (M.Tech.) in Artificial Intelligence (Discipline: Electronics & Communication Engineering).

- Postgraduate (PG) engineering degree of (Interdisciplinary) academic programme in Translational Engineering shall be mentioned as Master of Technology (M.Tech.) in Translational Engineering (Interdisciplinary / Civil Engineering).

R3.8 The medium of instruction followed by APJAKTU shall be English.

4.0 LEAVE RULES FOR M.TECH STUDENTS

R4.1 M. Tech students are eligible for leave of 30 days in a year (15 days per semester). The intervening holidays will be treated as part of leave with provision of suffixing and prefixing holidays. In no way the leave rules would relax the attendance requirements for the students mentioned in R6.9.

R4.2 M. Tech students would apply to the HoD concerned for leave stating the specific reasons.

R4.3 M. Tech students shall be eligible to leave station for visiting other places preferably after completion of their course work or during vacations when there is no teaching work scheduled based on the recommendation by the supervisor(s) and approval by the HoD. The permission will be granted for library consultation, meeting experts, presentation of research papers/participation in the conferences/short term courses/symposiums etc., getting samples tested from other laboratories, using the lab facilities elsewhere, interaction with the External supervisor, and any other similar purpose. For these purposes, he/she shall be permitted for 30 days per year. The leave as mentioned at Clause 4.1 shall be in addition to this.

5.0 COURSE REGISTRATION AND ENROLMENT

R5.1 It is mandatory for students to register for the courses they intend to attend in a semester. For the first semester every student has to enrol and register for the courses he/she intends to undergo on a specified date notified to the students by the University. Similarly the students need to register for second, third and fourth semesters.

R5.2 The dates for registration and enrolment will be given in the academic calendar.

R5.3 A student will become eligible for enrolment only if he/she has registered for all the courses listed in the curriculum of the previous semester. In addition

he/she has to clear all dues to the Institute up to the end of the previous semester and also he/she and should not have any pending disciplinary proceedings. Besides, a student should have fulfilled the credit requirement as given in Table 2 for registering to higher semesters.

Table 2: Minimum Cumulative Credit Requirements for Registering to Higher Semesters

Semester	Allotted credits	Cumulative credits	Minimum credits required
1	18	18	Not Applicable
2	18	36	Not Insisted
3	16	52	12 credits from S_1
4	16	68	Not Insisted

R5.4 The maximum number of credits a student can register (course registration) in a semester is limited to 6 credits in excess of the total credits allotted in the curriculum for that semester.

R5.5 In extraordinary circumstances like medical grounds, a student may be permitted to withdraw from a semester completely. Normally a student will be permitted to withdraw from the programme for a maximum continuous period of two semesters only.

6.0 ASSESSMENT PROCEDURE

R6.1 In the first, second and the third semesters, all the courses to be credited are evaluated through continuous internal assessment and end semester examinations. For all lecture based courses (except the Programme Electives and Research Methodology & IPR in the first semester) and for all lecture based courses (except the Programme Electives and Industry/Interdisciplinary Elective in the second semester), the end semester examination will be conducted by the University. For Programme Electives, Industry/Interdisciplinary Elective, Research Methodology & IPR, laboratory Part I and II, Miniproject, Open Elective and dissertation/research project Part I, the end semester examination will be conducted by the respective Colleges. Dissertation/research project Part II will be evaluated through continuous internal assessment and external assessment.

R6.2 The maximum marks allotted for all lecture based courses for continuous internal assessment is fixed as 40 and for the end semester examination as 60, unless otherwise specified in the curriculum**.** The assessment marks for all courses are listed in the curriculum.

R6.3 Students registered for a course have to attend the course regularly, meet the attendance requirements and undergo the entire evaluation procedure for the completion of the course. Credits for the courses are deemed to be earned only on getting a P grade (Pass) in the composite evaluation.

R6.4 Continuous Internal Assessment (CIA): The marks awarded for the continuous internal assessment shall be on the basis of the day-to-day work, micro project, course based project/task, seminar, data collection/interpretation, preparation of review articles, quizzes, periodic tests, etc. The faculty member (s) concerned shall carry out the continuous assessment for the course allotted to him/her. The CIA marks for individual courses shall be computed by giving weightage to the parameters as specified in the curriculum.

R6.5 The CIA marks obtained by the student for all courses in a semester are to be published in the department notice board as stipulated in the academic calendar. Anomalies if any shall be rectified by the Institution. A copy of the CIA marks uploaded to the University shall be kept in the department for scrutiny and reference.

R6.6 The marks obtained for the ESE for a programme elective course shall not exceed 20% over the average ESE mark % for the core courses. ESE marks awarded to a student for each programme elective course shall be normalized accordingly. For example if the average end semester mark % for a core course is 40, then the maximum eligible mark % for a programme elective course is 40+20 = 60 %. The normalisation shall not be applicable for Research Methodology & IPR, Industry/Interdisciplinary Elective and Audit Course.

R6.7 CIA mark percentage for a course shall not exceed 30% over the End Semester Examination mark % of that course. CIA marks awarded to a student for each course shall be normalized accordingly. For example if the end semester mark % for a course is 40, then the maximum eligible CIE mark % for that course is 40+30 = 70 %. The normalisation will not be done in the cases of internship and dissertation/research project phase 2.

R6.8 The end semester examinations shall be held twice in a year: April/May session (for even semesters) and November/December session (for odd semesters). However, the end semester examinations of the third/fourth semester shall be conducted in both the sessions.

R6.9 The eligibility criteria for registering to the end semester examination are attendance in the course and no pending disciplinary action. The minimum attendance for appearing for the end semester examination for any course is 75%. Students who get scholarships from the Central or State Governments or any other agencies are expected to have 100 % attendance. However, under unavoidable circumstances students are permitted to take leave as per clause number 4. Leave of absence for all these activities is limited to 25 % of the academic contact hours for the course. Students who do not meet these eligibility criteria are ineligible (identified by FE grade) to appear for the ESE.

R6.10 On medical ground the Principal can relax the minimum attendance requirement to 65%, to register for the end semester examination. This is permitted for one or more courses registered in the semester. The Principal shall keep all records which led to the decision on attendance, for verification by the Academic Auditor. However this concession is applicable to any one semester during the entire programme.

R6.11 The Principal of the Institution is authorized to grant attendance relaxation (duty leave) to the students for organizing extra/co-curricular activities, up to a maximum of 5%. Students should produce required documents countersigned by the University Sports Coordinator/ the Director of Physical Education in the case of sports activities or the Faculty Advisor in the case of other extra/co-curricular activities, as the case may be, within ten days of the event, for awarding the relaxation. The documents thus produced shall be forwarded to the Principal with due recommendation of the Head of the Department. Under any circumstances, the principal shall not consider the documents, if the overall attendance of the candidate is less than 65%. Late applications received shall not be considered.

R6.12 The students with courses having FE grade shall register for the courses again during the succeeding semesters in which the courses are offered. However, for the third semester students having FE grades can register for the courses in the next immediate chance, if offered by their institute.

R6.13 Students, who have completed a course but could not write the end semester examination, shall be awarded 'AB' Grade, provided they meet other eligibility criteria (R6.8). They shall register (exam registration) and appear for the end semester examination at the next available opportunity and earn credits without having to register (course registration) for the course again.

R6.14 A student should obtain a minimum of 45% marks in the end semester examination and a minimum of 50 % of the total mark (CIA marks + ESE marks) (See Table 3) to be eligible for grading a course as Pass. The students who have not scored minimum of 45% marks in the end semester examination and minimum of 50 % of the total mark (CIA marks + ESE marks) will be considered to have failed in the course and an F grade will be awarded.

Table 3 Weightage of the CIA and ESE for various categories of the courses

Sl. No	Category	CIA Weightage	ESE Weightage	Pass Minimum
1	Discipline Core Courses	40%	60%	45% for ESE and 50% for (CIA and ESE) put together
2	Programme Core Courses	40%	60%	45% for ESE and 50% for (CIA and ESE) put together
3	Programme Elective Courses	40%	60%	45% for ESE and 50% for (CIA and ESE) put together
4	Lab Courses/ Mini-project	100%	---	50% for CIA
5	MOOC	----	----	As stipulated by the agency conducting MOOC
6	Audit Course	40%	60%	45% for ESE and 50% for (CIA and ESE) put together
7	Internship	50%	50%	45% for ESE and 50% for (CIA and ESE) put together

Sl. No	Category	CIA Weightage	ESE Weightage	Pass Minimum
8	Dissertation/ Research Project Phase 1	100%	---	50% for CIA
9	Dissertation/ Research Project Phase 2	50%	50%	45% for ESE and 50% for (CIA and ESE) put together

R6.15 For the courses with no end semester examination, Letter grade 'F' will be awarded if CIA mark is below 50%.

R6.16 Candidates who received F grade in a course shall have to appear the end semester examination at the next available opportunity and earn the credits. Grades awarded in the supplementary examination will be considered as the grades in these courses.

R6.17 A student shall be eligible for the award of M. Tech Degree of the University on satisfying the following requirements:

- Fulfilled all the curriculum requirements within the maximum duration permitted for the programme
- No pending disciplinary action.

R6.18 Grading is based on the % marks obtained by the student for a course. Semester grade card shall contain the grade for each registered course, Semester Grade Point Average (SGPA) for the semester as well as Cumulative Grade Point Average (CGPA) up to that semester.

Grades and Grade Points are assigned as follows:

Grades	Grade Point	% of Total Marks obtained in the course
S	10	90% and above
A+	9	85% and above but less than 90%
A	8.5	80% and above but less than 85%
B+	8	75% and above but less than 80%
B	7.5	70% and above but less than 75%
C+	7	65% and above but less than 70%

C	6.5	60% and above but less than 65%
D	6	55% and above but less than 60%
P (Pass)	5.5	50% and above but less than 55%
F(Fail)	0	Below 50% (CIA + ESE) or Below 45% for ESE
FE	0	Failed due to lack of eligibility criteria
AB	0	Could not appear for the end semester Examination but fulfils the eligibility criteria.

Calculation of SGPA/CGPA

Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA) are calculated as follows:

SGPA = Σ(Ci×GPi)/ΣCi , where 'Ci' is the credit assigned for a course i and 'GPi' is the grade point for that course. Summation is done for all courses registered by the student in the semester. The failed and incomplete courses shall also be considered in the calculation.

CGPA = Σ(Ci×GPi)/ΣCi , where 'Ci' is the credit assigned for a course i and 'GPi' is the grade point for that course.Summation is done for all courses specified in the curriculum up to that semester for which the 'CGPA' is needed. Here the failed courses shall also be accounted. CGPA for the M. Tech programme is arrived at by considering all course credits that are needed for the degree and their respective grade points.

Note: Students whoever successfully completed MOOC Course, GPi will be taken as 10 for both SGPA and CGPA calculation.

R6.19 Classification of M.Tech Degree

First Class with Distinction:	CGPA 8.0 and above
First Class:	CGPA 6 and above
Equivalent percentage marks:	10 * CGPA – 2.5

R6.20 Grade cards shall be made available in the student login for the registered courses, in every semester. On earning the required credits for the degree, the University will issue the Degree Certificate and Consolidated Grade Card.

R6.21 Valuation: Answer papers of theory examinations, for which end semester examinations are conducted by the University, shall be valued by two examiners. These two examiners shall preferably be from two different colleges. If the difference between the marks awarded by the two Examiners is not more than 15 per cent of the maximum marks for ESE for the course, the marks awarded to the candidate shall be the average of two evaluations. If the difference in marks obtained in two valuations exceeds 15% of the maximum marks for the course, the answer script will be evaluated by a third examiner. The average of the closest two marks shall be considered as the marks secured by the candidate. However, if one of the three marks falls exactly midway between the other two, then the highest two marks shall be taken for averaging.

R6.22 Review: Option for revaluation is not available to the M.Tech programme. However, answer scripts of the courses for which examinations have been conducted by the University can be reviewed as per request by the student. Outcome of the review shall be for improvement of marks and improvement of grade. In this case, the marks obtained in the 1st valuation, 2nd valuation and review shall be considered. The average of the two closest marks of the above three shall be considered as the marks obtained after review. In case of a tie of the closest marks, the average of all three above i.e. 1st valuation, 2nd valuation and review shall be considered as the marks obtained after review. Detailed procedure is given in the examination manual.

R6.23 Malpractices in Examinations: Any act of violation of the directions of the University, indiscipline, misbehaviour, unfair practice in examinations from the part of students, faculty/staff members, institution, management or any other source and malpractices in examinations observed or reported by faculty member, invigilator, any official appointed by the University or anybody shall be dealt with promptly as per the prescribed norms in the examination manual.

Note: Notwithstanding the above regulations related to examinations, assessments and malpractices, the details provided in the Examination Manual shall be taken as reference and final.

7.0 ACADEMIC MONITORING AND STUDENT SUPPORT

R7.1 The implementation and monitoring of academic activities relating to the PG programme will be entrusted with the College Level Academic Committee

(CLAC) for the institutions and with the Department Level Academic Committee (DLAC) for each department.

CLAC comprises following members:

- Principal - Chairman
- PG Dean - Secretary
- Heads of Departments/PG Coordinators of the Department having M.Tech Programme - Members
- UG Dean - ember
- Dean Research - Member

Functions of CLAC: CLAC shall conduct at least two meetings in each semester. The minutes of the meeting along with the action taken report shall be maintained with the counter sign of the Principal in the PG Dean's Office. All these documents will be verified by the external auditor during academic auditing. Agenda of the meeting shall include the following points:

- Review of the progress of course coverage against the academic calendar and the course plan and suggestions for improvement
- Academic standard and excellence of various programmes
- Performance appraisal of Faculty handling the course as reported by DLAC
- Matters related to the postgraduate programme of various departments
- Any responsibility or function assigned by the University

DLAC comprises the following members:

- Head of the Department - Chairman
- PG Coordinator of the Department - Secretary
- Programme Coordinators of all M.Tech Programmes in the Department - Members
- Department Coordinator for UG - Member
- Two Faculty Members handling PG Classes - Members

Functions of DLAC: DLACshall conduct at least three meetings in each semester. Minutes of the meeting along with the action taken report (with the counter sign of the HoD) shall be maintained by the PG coordinator. The relevant points of the meeting shall be communicated to the Principal/PG Dean for reporting in the CLAC. All these documents will be verified by the external auditor during academic auditing. The following points shall be discussed in the meeting:

- Academic standard and excellence of the courses offered by the department.
- To verify whether the course progress in alignment with Academic calendar.
- To oversee the continuous internal evaluation of the students in a class, for each course.
- Performance appraisal of Faculty handling the courses
- Any matter related to the M.Tech programme of the department.
- Any appropriate responsibility or function assigned by the University or the Principal.

R7.2 PG Coordinator: Each Department will have a Professor as the PG Coordinator. The responsibilities of the PG Coordinator are:

- To supervise and coordinate the activities of the PG courses.
- To guide and advice the students in all academic matters.
- To keep a record of the academic activities of students registered for all M Tech programmes in that department.
- To maintain the attendance of the students on a daily basis (FN & AN).

R7.3 Programme Coordinators: In the departments where more than one M.Tech programmes are offered, one senior faculty assigned by HoD will act as the programme coordinator for coordinating the academic activities in the department for that PG programme. Programme coordinator will be having the role of Faculty Adviser (FA) of that programme. If the department has only one M.Tech programme, PG coordinator may serve as the programme coordinator.

The responsibilities of the programme coordinators are:

- To supervise and coordinate the activities of the particular programme.
- To guide and advice the students in all academic matters.
- To keep a record of the academic and non-academic activities of students registered for the particular M Tech programme
- Regular communication with the parents of students in respect of progress in academic and other general matters.
- Keep custody of the minutes and action taken reports of the meetings conducted with the students.

R7.4 The internal marks and attendance shall be uploaded in the University portal by the respective faculty members after displaying the same in the department notice board as stipulated in the academic calendar. If any anomalies are raised by the students, it shall be rectified by the Institution. A copy of the CIA marks uploaded to the University shall be kept in the department for scrutiny and reference.

8.0 BREAK OF STUDY

R8.1 Students are permitted to avail break of study for a maximum duration of two semesters. Availing break of study could extend the duration of the programme up to eight semesters, the maximum permitted duration by the regulation. The student can avail the break of study only with the prior approval of the University. The Principal, along with his/her recommendations, shall upload the request of the student with all relevant documents to the University portal for the approval. Students shall have to re-join at the commencement of the incomplete semester where he/she had started availing the break of study.

Students are permitted to avail break of study:

- In case of accident or serious illness needing prolonged hospitalization and rest.
- In case of any personal reasons that need a break in study.
- For taking up an employment.

R8.2 For break of study due to illness, student shall submit all necessary medical reports together with the recommendation of the doctor treating him giving

definite reasons for break of study and its duration. Before joining back, the student should submit the fitness certificate from the doctor who treated him.

R8.3 Students who require a break in study due to personal reasons shall get the approval from the Principal on the genuineness of the need for it by providing authentic evidences for the same.

R8.4 Students who require break of study for 'taking up a job' shall produce the offer letter obtained from the employer concerned. The principal shall verify the authenticity of the offer and submit his recommendation to the University sufficiently in advance for approval.

9.0 ACADEMIC AUDITING

R9.1 There shall be academic auditing in each affiliated college at stipulated intervals. The internal academic auditing shall be conducted by Internal Quality Assurance Cell (IQAC) functioning within the college and the external academic auditing by auditor/auditors appointed by the University. The IQAC in each college shall oversee and monitor all the academic activities including all internal evaluations and examinations. This cell shall prepare academic audit statements in formats prescribed by the University for each semester at regular intervals. These reports shall be presented to the external academic auditor/auditors, who shall use it as reference for independent auditing. The external auditors shall submit the final audit report to the University in the prescribed format through University portal.

Academic auditing shall cover the activities mentioned in the audit manual and in the regulations. Important aspects to be covered are the following:

- Course delivery, adherence to the academic calendar regarding meetings of various committees and series tests, syllabus coverage, quality of question papers used for internal examinations, internal evaluation, maintenance of laboratory experimental set ups and equipment, mini projects, seminar and project evaluation, innovative teaching methods, and conduct of practical classes and their evaluation.
    - Facility for Co-curricular and Extra-curricular activities available for the students.
    - Academic functioning of the college encompassing students, faculty and college administration covering punctuality, attendance, discipline,

academic environment, learning ecosystem, academic accountability, academic achievements and benchmarking.

10.0 MIGRATION FROM OTHER UNIVERSITIES

R10.1 Migration to the University from other Universities shall be permitted only if the other University is approved by the UGC/AICTE/AIU and subject to the recommendation by the respective BoS.

R10.2 The student shall be permitted to migrate only if he/she fulfils the University eligibility criteria for admission to the course applied for migration. The student shall be permitted to migrate only if he/she has passed all the previous semester(s) in the parent University.

R10.3 The migration shall be permitted only up to the third semester of the M. Tech program.

R10.4 The admission shall be offered on migration basis through lateral transfer of credits.

R10.5 The students shall be allowed to migrate to the University subject to satisfying the rules and regulations of the University as regards to the programme such as maximum number of backlogs, grade points, minimum credit requirement for promotion to higher semesters, etc.

R10.6 The student shall be offered admission in any of the affiliated colleges/institutions of the University subject to availability of seats. The student shall produce no objection certificate from the concerned college/institute in this regard.

R10.7 The students offered admission shall register for the transitory/additional courses of the previous semesters to satisfy the program requirement as recommended by the concerned Board of Studies.

R10.8 The students offered admission shall produce a migration certificate from the parent University at the time of admission.

R10.9 The student offered admission shall produce a character and conduct certificate from the parent institute/University at the time of admission.

R10.10 Regulations, Scheme and Syllabus of the respective specialization attested by the Registrar of the parent University or equivalent authority shall be submitted to the University along with the application seeking migration to the University.

R10.11 Attested copies of all certificates and mark lists from 10th onwards shall be submitted along with the application for migration (Original certificates and mark lists shall be produced as and when demanded by the University).

R10.12 The students offered admission shall pay the migration fees and the University fees as prescribed by the University. The application processing fee (University fee) shall be Rs 5000/- (Rupees five thousand only) and the migration fees shall be Rs 20000/-(Rupees twenty thousand only). The processing fee shall be paid along with the application, and the migration fee shall be paid to the University at the time of offering admission. The fee once paid shall not be refunded under any circumstances. The students in any of the Engineering colleges/institutions, which, before the commencement of APJAKTU Act remained affiliated to Universities except Deemed Universities in the State of Kerala, are exempted from paying the processing fee and the migration fee.

R10.13 The migrated students shall follow the rules and regulations of the University.

11.0 GRACE MARKS FOR SPORTS /ARTS COMPETITIONS

R11.1 Only bona fide, regular students are eligible for the award of Grace Marks.

R11.2 The grace marks will be awarded to the students for representing the University in official level competitions/championships/ tournaments when called upon to do so. The student shall get official prior permission from the University for representing the University.

R11.3 The maximum grace marks that can be awarded to a candidate in a particular semester for all events participated during that semester shall be 5% of the aggregate maximum of the End Semester Examination marks of all theory courses for which the University conducts End Semester Examinations.

R11.4 The maximum grace marks that can be awarded to a student for a theory course in a particular semester for all events participated during that

semester shall not exceed 10% of the maximum aggregate marks of the End Semester Examination of that course.

R11.5 The Grace Marks shall not be awarded for Programme Electives/ Research Methodology & IPR/ Laboratory Courses/ Industry Elective/ Interdisciplinary Elective / Miniproject / Audit Course/ Dissertation/ Research Project etc even though she/he fails for the same.

R11.6 Eligible Grace Marks shall be distributed equally on all theory papers/courses of end semester examination of the semester concerned. However, redistribution of Grace Marks shall be allowed only in the case of those courses of an examination for which the candidate has passed. Redistribution is possible from passed courses to failed courses only. Redistribution of Grace Marks is not permissible from failed courses to other courses for a pass.

R11.7 The Grace Marks shall be awarded for all theory papers/courses in a semester.

R11.8 Redistribution shall be done only for enabling a candidate to obtain the minimum marks required for a pass.

R11.09 Grace Marks shall not be redistributed from one semester to another semester.

R11.10 If the candidate does not secure the minimum marks required for a pass even after effecting redistribution, eligible moderation fixed by the respective pass board if any, shall be awarded to that candidate in addition to the Grace Marks for a pass

R11.11 Eligible Grace Marks shall be awarded for the regular examination of the performing semester only. Grace Marks shall not be awarded for supplementary examinations.

R11.12 The performing semester shall generally be considered from 1st July to 31st December (Odd semester) and 1st January to 30th June (Even Semester) for the purpose of awarding grace marks.

R11.13 The request for Grace Marks shall be submitted to the Controller of Examinations through the principal along with all relevant documents, within

the time limit prescribed by the University. The request for Grace Marks received after the time limit shall not be entertained on any account.

R11.14 Only a single highest achievement during the period of a semester shall be considered for awarding the grace marks.

R11.15 Notwithstanding the above in R11, the guidelines given in the Examination manual and orders issued by the University from time-to-time will be followed. The R11.1 to R11.14 shall be taken as general information.

12.0 GRACE MARKS TO DIFFERENTLY ABLED CANDIDATES

R12.1 A person with disability (PWD) is a student of the University suffering from not less than 40% of any disability, as certified by the District Medical Board. To be eligible for the Grace marks, certificate of disability specifying the percentage of disability shall be produced before the Principal at the time of admission.

R12.2 The Grace marks that can be awarded for PWD shall be 25% of the marks, scored by the candidate in each course, at the time of finalization of the results.

R12.3 Transfer of marks from one paper to another shall not be permitted. Fractions of marks if any, while computing the Grace marks, shall be rounded off to the next higher integer.

R12.4 PWD who are eligible for Grace marks shall be awarded Grace marks, for regular and supplementary chances until they pass the whole examination.

R12.5 Grace marks shall be awarded only for the marks of the End Semester examinations conducted by the University.

R12.6 The request for Grace marks shall be submitted to the Controller of Examinations, through the Principal, along with all relevant documents, within the time limit prescribed by the University. The request for Grace marks received after the time limit shall not be entertained on any account.

M.TECH CURRICULUM

PROGRAM OUTCOMES - PO

Outcomes are the attributes that are to be demonstrated by a graduate after completing the course.

PO1: An ability to independently carry out research/investigation and development work in engineering and allied streams

PO2: An ability to communicate effectively, write and present technical reports on complex engineering activities by interacting with the engineering fraternity and with society at large.

PO3: An ability to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

PO4: An ability to apply stream knowledge to design or develop solutions for real world problems by following the standards

PO5: An ability to identify, select and apply appropriate techniques, resources and state-of-the-art tool to model, analyse and solve practical engineering problems.

PO6: An ability to engage in life-long learning for the design and development related to the stream related problems taking into consideration sustainability, societal, ethical and environmental aspects

PO7: An ability to develop cognitive load management skills related to project management and finance which focus on Entrepreneurship and Industry relevance.

The departments conducting the M. Tech course shall define their own PSOs, if required, and assessment shall also be done for the same.

SEMESTER I

Slot	Courses	Marks		L-T-P	Hours	Credit
		CIA	ESE			
A	Discipline Core 1	40	60	3-0-0	3	3
B	Program Core 1	40	60	3-0-0	3	3
C	Program Core 2	40	60	3-0-0	3	3
D	Program Elective 1	40	60	3-0-0	3	3
E	Program Elective 2	40	60	3-0-0	3	3
S	Research Methodology & IPR	40	60	2-0-0	2	2
T	Laboratory 1	100	--	0-0-2	2	1
Total		**340**	**360**		**19**	**18**

Teaching Assistance: 6 hours

SEMESTER II

Slot	Courses	Marks		L-T-P	Hours	Credit
		CIA	ESE			
A	Discipline Core 2	40	60	3-0-0	3	3
B	Program Core 3	40	60	3-0-0	3	3
C	Program Elective 3	40	60	3-0-0	3	3
D	Program Elective 4	40	60	3-0-0	3	3
E	Industry/Interdisciplinary Elective	40	60	3-0-0	3	3
S	Mini project	100	--	0-0-4	4	2
T	Laboratory 2	100	--	0-0-2	2	1
TOTAL		**400**	**300**		**21**	**18**

Teaching Assistance: 6 hours

A few recommended Discipline Core Courses

- Advanced Computational Mathematics
- Linear Algebra
- Advanced Numerical Methods
- Optimization Techniques
- Probability, Statistics & Stochastic Processes
- Quantitative Methods for Artificial Intelligence
- Big Data Technologies
- Machine Learning with Python
- Automata & Languages
- Deep Learning & Neural Networks
- Computer Vision
- Natural Language Processing
- Advanced Machine Learning
- Internet of Things

SEMESTER III

Slot	Courses	Marks		L-T-P	Hours	Credit
		CIE	ESE			
TRACK 1						
A*	MOOC	To be completed successfully		--	--	2
B	Audit Course	40	60	3-0-0	3	-
C	Internship	50	50	--	--	3
D	Dissertation Phase 1	100	--	0-0-17	17	11
TRACK 2						
A*	MOOC	To be completed successfully		--	--	2
B	Audit Course	40	60	3-0-0	3	-
C	Internship	50	50	---	--	3
D	Research Project Phase 1	100	--	0-0-17	17	11
TOTAL		**190**	**110**		**20**	**16**

Teaching Assistance: 6 hours

*MOOC Course to be successfully completed before the commencement of fourth semester (starting from semester 1).

Sample Audit Courses

- English for Research Paper Writing
- Business Communication and Presentation Skills
- Ethics & Human Values
- Pedagogy Studies
- Cost Management of Engineering Projects
- Personality Development through Life Enlightenment Skills
- Operations Research
- Composite Materials
- Energy from Waste
- Entrepreneurship Development
- Principles of Automation

SEMESTER IV

Slot	Courses	Marks		L-T-P	Hours	Credit
		CIA	ESE			
TRACK 1						
A	Dissertation Phase II	100	100	0-0-24	24	16
TRACK 2						
A	Research Project Phase II	100	100	0-0-24	24	16
TOTAL		**100**	**100**		**24**	**16**

Teaching Assistance: 5 hours

TRACK 1 / TRACK 2

In second year, the students can choose either of the two tracks: TRACK 1 or TRACK 2. Track 1 is conventional M.Tech programme and Track 2 is M.Tech programme designed for students with scientific vigor for research and scientific knowledge. An aspirant in track 2 needs to have a flavour for research and passion for the topic. The candidates should also be good with performing in-depth research and colluding the conclusions of research led by them. Such students are expected to have the following skills: Technical Skills, Research Skills, Communication Skills, Critical Thinking Skills, and Problem Solving Skills.

The eligibility for Track 2:

- Shall have qualified in the GATE or have a SGPA above 8.5 during the first semester, and
- Qualify an interview during the end of second semester by an expert committee constituted by the respective Institutions

In research project track, the research work shall be accepted or published in a journal (indexed in SCI/Unpaid SCOPUS).

COURSE NUMBERING SCHEME

The course number consists of digits/alphabets. The pattern to be followed is **YYCDDSNN**. It is illustrated below:

YY: Last two digits of year of regulation

C: Course Type

0 - Discipline Core
1 - Programme Core
2 - Programme Elective
3 - Interdisciplinary Elective
4 - External (Industry Elective, MOOC, Internship etc.)
5 - General Course (Research Methodology, Audit Course etc.)
6 - Laboratory Course
7 - Project (Dissertation, Research Project etc.)
8 - Audit Course

DD: Department offering the course

Sl.No	Department	Course Prefix
01	AE & Instrumentation	AE
02	Biomedical Engg	BM
03	Biotechnology	BT
04	Chemical Engg	CH
05	Civil Engg	CE
06	Computer Science	CS
07	Electrical & Electronics	EE

Sl.No	Department	Course Prefix
08	Electronics & Communication	EC
09	General	GE
10	Information Technology	IT
11	Instrumentation & Control	IC
12	Mechanical Engg	ME
13	Production Engg	PE
14		

S: Semester of study

1 - Semester 1
2 - Semester 2
3 - Semester 3
4 - Semester 4

NN: Course sequence number

Examples:

- 221CE202 is a programme core offered by the Civil department in semester 2
- 228ME301 is an audit course offered by the ME dept in semester 3
- 225GE101 is the code for Research Methodology for all programmes offered in semester 1

ASSESSMENT PATTERN

(i) CORE COURSES

Evaluation shall only be based on application, analysis or design based questions (for both internal and end semester examinations).

Continuous Internal Evaluation: 40 marks

Micro project/Course based project	:	20 marks
Course based task/Seminar/Quiz	:	10 marks
Test paper, 1 no.	:	10 marks

The project shall be done individually. Group projects not permitted. Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The end semester examination will be conducted by the University. There will be two parts; Part A and Part B. Part A contain 5 numerical questions (such questions shall be useful in the testing of knowledge, skills, comprehension, application, analysis, synthesis, evaluation and understanding of the students), with 1 question from each module, having 5 marks for each question. Students shall answer all questions. Part B contains 7 questions (such questions shall be useful in the testing of overall achievement and maturity of the students in a course, through long answer questions relating to theoretical/practical knowledge, derivations, problem solving

and quantitative evaluation), with minimum one question from each module of which student shall answer any five. Each question can carry 7 marks. Total duration of the examination will be 150 minutes.

(ii) ELECTIVE COURSES

Evaluation shall only be based on application, analysis or design based questions (for both internal and end semester examinations).

Continuous Internal Evaluation: 40 marks

Preparing a review article based on peer reviewed

Original publications (minimum 10 publications shall be referred)	:	15 marks
Course based task/Seminar/Data collection and interpretation	:	15 marks
Test paper, 1 no.	:	10 marks

Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The end semester examination will be conducted by the respective College. There will be two parts; Part A and Part B. Part A will contain 5 numerical/short answer questions with 1 question from each module, having 5 marks for each question (such questions shall be useful in the testing of knowledge, skills, comprehension, application, analysis, synthesis, evaluation and understanding of the students). Students should answer all questions. Part B will contain 7 questions (such questions shall be useful in the testing of overall achievement and maturity of the students in a course, through long answer questions relating to theoretical/practical knowledge, derivations, problem solving and quantitative evaluation), with minimum one question from each module of which student should answer any five. Each question can carry 7 marks.

Note: The marks obtained for the ESE for an elective course shall not exceed 20% over the average ESE mark % for the core courses. ESE marks awarded to a student for each elective course shall be normalized accordingly. For example if the average end semester mark % for a core course is 40, then the maximum eligible mark % for an elective course is 40+20 = 60 %.

(iii) RESEARCH METHODOLOGY & IPR/AUDIT COURSE

Continuous Internal Evaluation: 40 marks

Course based task	:	15 marks
Seminar/Quiz	:	15 marks
Test paper, 1 no.	:	10 marks

Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The examination will be conducted by the respective College. The examination will be for 150 minutes and will contain 7 questions, with minimum one question from each module of which student should answer any five. Each question can carry 12 marks.

(iv) INTERNSHIP

Internships are educational and career development opportunities, providing practical experience in a field or discipline. They are structured, short-term, supervised placements often focused around particular tasks or projects with defined timescales. An internship may be compensated or non-compensated by the organization providing the internship. The internship has to be meaningful and mutually beneficial to the intern and the organization. It is important that the objectives and the activities of the internship program are clearly defined and understood. The internship offers the students an opportunity to gain hands-on industrial or organizational exposure; to integrate the knowledge and skills acquired through the coursework; interact with professionals and other interns; and to improve their presentation, writing, and communication skills. Internship often acts as a gateway for final placement for many students.

A student shall opt for carrying out the Internship at an Industry/Research Organization or at another institute of higher learning and repute (Academia). The organization for Internship shall be selected/decided by the students on their own with prior approval from the faculty advisor/respective PG Programme Coordinator/Guide/Supervisor. Every student shall be assigned an internship Supervisor/Guide at the beginning of the Internship. The training shall be related to their specialisation after the second semester for a minimum duration of six to eight weeks. On completion of the course, the student is expected to be able to develop skills in facing and solving the problems experiencing in the related field.

Objectives

- Exposure to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry.
- Provide possible opportunities to learn understand and sharpen the real time technical / managerial skills required at the job.
- Exposure to the current technological developments relevant to the subject area of training.
- Create conducive conditions with quest for knowledge and its applicability on the job.
- Understand the social, environmental, economic and administrative considerations that influence the working environment.
- Expose students to the engineer's responsibilities and ethics.

Benefits of Internship

Benefits to Students

- An opportunity to get hired by the Industry/ organization.
- Practical experience in an organizational setting & Industry environment.
- Excellent opportunity to see how the theoretical aspects learned in classes are integrated into the practical world. On-floor experience provides much more professional experience which is often worth more than classroom teaching.
- Helps them decide if the industry and the profession is the best career option to pursue.
- Opportunity to learn new skills and supplement knowledge.
- Opportunity to practice communication and teamwork skills.
- Opportunity to learn strategies like time management, multi-tasking etc in an industrial setup.
- Makes a valuable addition to their resume.
- Enhances their candidacy for higher education/placement.
- Creating network and social circle and developing relationships with industry people.

- Provides opportunity to evaluate the organization before committing to a full time position.

Benefits to the Institute

- Build industry academia relations.
- Makes the placement process easier.
- Improve institutional credibility & branding.
- Helps in retention of the students.
- Curriculum revision can be made based on feedback from Industry/ students.
- Improvement in teaching learning process.

Benefits to the Industry

- Availability of ready to contribute candidates for employment.
- Year round source of highly motivated pre-professionals.
- Students bring new perspectives to problem solving.
- Visibility of the organization is increased on campus.
- Quality candidate's availability for temporary or seasonal positions and projects.
- Freedom for industrial staff to pursue more creative projects.
- Availability of flexible, cost-effective workforce not requiring a long-term employer commitment.
- Proven, cost-effective way to recruit and evaluate potential employees.
- Enhancement of employer's image in the community by contributing to the educational enterprise.

Types of Internships

- Industry Internship with/without Stipend
- Govt / PSU Internship (BARC/Railway/ISRO etc)
- Internship with prominent education/research Institutes
- Internship with Incubation centres /Start-ups

Guidelines

- All the students need to go for internship for minimum duration of 6 to 8 weeks.
- Students can take mini projects, assignments, case studies by discussing it with concerned authority from industry and can work on it during internship.
- All students should compulsorily follow the rules and regulations as laid by industry.
- Every student should take prior permissions from concerned industrial authority if they want to use any drawings, photographs or any other document from industry.
- Student should follow all ethical practices and SOP of industry.
- Students have to take necessary health and safety precautions as laid by the industry.
- Student should contact his /her Guide/Supervisor from college on weekly basis to communicate the progress.
- Each student has to maintain a diary/log book
- After completion of internship, students are required to submit
    - Report of work done
    - Internship certificate copy
    - Feedback from employer / internship mentor
    - Stipend proof (in case of paid internship).

Total Marks 100: The marks awarded for the Internship will be on the basis of (i) Evaluation done by the Industry (ii) Students diary (iii) Internship Report and (iv) Comprehensive Viva Voce.

Continuous Internal Evaluation: 50 marks

Student's diary	-	25 Marks
Evaluation done by the Industry	-	25 Marks

Student's Diary/ Daily Log: The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily training diary the day to day account of the observations,

impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students. The daily training diary should be signed after every day by the supervisor/ in charge of the section where the student has been working. The diary should also be shown to the Faculty Mentor visiting the industry from time to time and got ratified on the day of his visit. Student's diary will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the diary
- Adequacy & quality of information recorded
- Drawings, design, sketches and data recorded
- Thought process and recording techniques used
- Organization of the information.

The format of student's diary

Name of the Organization/Section:

Name and Address of the Section Head:

Name and Address of the Supervisor:

Name and address of the student:

Internship Duration: From ..... To .....

Brief description about the nature of internship:

Day	Brief write up about the Activities carried out: Such as design, sketches, result observed, issues identified, data recorded, etc.
1	
2	
3	

Signature of Industry Supervisor *Signature of Section Head/HR Manager*

Office Seal

Attendance Sheet

Name of the Organization/Section:

Name and Address of the Section Head:

Name and Address of the Supervisor:

Name and address of the student:

Internship Duration: From ..... To .....

Month & Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	...
Month & Year																					
Month & Year																					

Signature of Industry Supervisor *Signature of Section Head/HR Manager*

Office Seal

Note:

- Student's Diary shall be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.
- Attendance Sheet should remain affixed in daily training diary. Do not remove or tear it off.
- Student shall sign in the attendance column. Do not mark 'P'.
- Holidays should be marked in red ink in the attendance column. Absent should be marked as 'A' in red ink.

Evaluation done by the Industry (Marks 25)

Format for Supervisor Evaluation of Intern

Student Name :_____Date:_____

Supervisor Name :_____Designation:_____

Company/Organization :_____

Internship Address: _____

Dates of Internship: From_____To _____

Please evaluate intern by indicating the frequency with which you observed the following parameters:

Parameters / **Marks**	Needs improvement (0 – 0.25 mark)	Satisfactory (0.25 – 0.50 mark)	Good (0.75 mark)	Excellent (1 mark)
Behavior				
Performs in a dependable Manner				
Cooperates with coworkers and supervisor				
Shows interest in work				
Learns quickly				
Shows initiative				
Produces high quality work				
Accepts responsibility				
Accepts criticism				
Demonstrates organizational skills				
Uses technical knowledge and expertise				
Shows good judgment				
Demonstrates creativity/originality				
Analyzes problems effectively				
Is self-reliant				
Communicates well				
Writes effectively				
Has a professional attitude				
Gives a professional appearance				
Is punctual				
Uses time effectively				

Overall performance of student

Intern (Tick one) : Needs improvement (0 - 0.50 mark) / Satisfactory (0.50 – 1.0 mark) / Good (1.5 mark) / Excellent (2.0 mark)

Additional comments, if any (2 marks):

Signature of Industry Supervisor *Signature of Section Head/HR Manager*

Office Seal

End Semester Evaluation (External Evaluation): 50 Marks

Internship Report	-	25 Marks
Viva Voce	-	25 Marks

Internship Report: After completion of the internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period and should be submitted to the faculty Supervisor. The student may contact Industrial Supervisor/ Faculty Mentor for assigning special topics and problems and should prepare the final report on the assigned topics. Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor, Programme Coordinator and Faculty Mentor.

The Internship report (25 Marks) will be evaluated on the basis of following criteria:

- Originality
- Adequacy and purposeful write-up
- Organization, format, drawings, sketches, style, language etc.
- Variety and relevance of learning experience
- Practical applications, relationships with basic theory and concepts taught in the course

Viva Voce (25 Marks) will be done by a committee comprising Faculty Supervisor, PG Programme Coordinator and an external expert (from Industry or research/academic Institute). This committee will be evaluating the internship report also.

(v) LABORATORY COURSES

The laboratory courses will be having only Continuous Internal Evaluation and carries 100 marks. Final assessment shall be done by two examiners; one examiner will be a senior faculty from the same department.

(vi) INDUSTRY BASED ELECTIVE/INTERDISCIPLINARY ELECTIVE

Engineering students frequently aspire to work in areas and domains that are key topics in the industry. There are concerns by recruiters that skill sets of engineering students did not match with the Industry requirements, especially in the field of latest topics. In response to their desires, the University has incorporated Industry/Interdisciplinary electives in the curriculum.

Interdisciplinary knowledge is critical for connecting students with current industry trends, where multitasking is the norm. Interdisciplinary knowledge aids in the bridge-building process between academic institutions and industry. It aids pupils in expanding their knowledge and innovating by allowing them to create something new. While core engineering courses provide students with a strong foundation, evolving technology necessitates new methods and approaches to progress, prosperity, and the inculcation of problem-solving techniques. Other courses' knowledge, on the other hand, can assist them to deal with any scenario more effectively. Interdisciplinary courses may be one approach to address such needs, as they can aid in the enhancement of engineering education and the integration of desirable specialised subjects into the current engineering education system. This will enable students to fulfil the current industry demands. Students with multidisciplinary knowledge and projects are more likely to be placed in top industries, according to the placement trend. The future of developing engineers will be influenced by their understanding of emerging technology and interdisciplinary approaches such as big data, machine learning, and 3-D printing.

Rapid technological advancements and the onset of the Fourth Industrial Revolution have resulted in a massive revival in the way engineering works in the industry. Projects necessitate the integration of knowledge and abilities from a diverse variety of engineering specialities, with the barriers between them becoming increasingly blurred.

Students can choose courses offered by other departments/nearby Industries that cover a wide range of highly relevant topics such as artificial intelligence, internet of things, big data, automation, and other software or other relatable courses.

The assessment pattern for Interdisciplinary electives is as follows:

Continuous Internal Evaluation: 40 marks

Preparing a review article based on peer reviewed

Original publications (minimum 10 publications shall be referred)	:	15 marks
Course based task/Seminar/Data collection and interpretation	:	15 marks
Test paper, 1 no.	:	10 marks

Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The end semester examination will be conducted by the respective College. There will be two parts; Part A and Part B. Part A will contain 5 numerical/short answer questions with 1 question from each module, having 5 marks for each question (such questions shall be useful in the testing of knowledge, skills, comprehension, application, analysis, synthesis, evaluation and understanding of the students). Students should answer all questions. Part B will contain 7 questions (such questions shall be useful in the testing of overall achievement and maturity of the students in a course, through long answer questions relating to theoretical/practical knowledge, derivations, problem solving and quantitative evaluation), with minimum one question from each module of which student should answer any five. Each question can carry 7 marks.

The assessment pattern for Industry based electives is as follows:

Continuous Internal Evaluation: 40 marks

The continuous internal evaluation will be done by the expert in the Industry handling the course.

Micro project/Course based project	:	20 marks
Course based task/Seminar/Quiz	:	10 marks
Test paper, 1 no.	:	10 marks

The project shall be done individually. Group projects not permitted. Test paper shall include minimum 80% of the syllabus.

End Semester Examination: 60 marks

The examination will be conducted by the respective College with the question paper provided by the Industry. The examination will be for 150 minutes and will contain 7 questions, with minimum one question from each module of which student should answer any five. Each question can carry 12 marks. The valuation of the answer scripts shall be done by the expert in the Industry handling the course.

(vii) MOOC COURSES

The MOOC course shall be considered only if it is conducted by the agencies namely AICTE/NPTEL/SWAYAM or NITTTR. The MOOC course should have a minimum duration of 8 weeks and the content of the syllabus shall be enough for at least 40 hours of teaching. The course should have a proctored/offline end semester examination. The students can do the MOOC according to their convenience, but

shall complete it by third semester. The list of MOOC courses will be provided by the concerned BoS if at least 70% of the course content match with the area/stream of study. The course shall not be considered if its content has more than 50% of overlap with a core/elective course in the concerned discipline or with an open elective.

MOOC Course to be successfully completed before the commencement of fourth semester (starting from semester 1). A credit of 2 will be awarded to all students whoever successfully completes the MOOC course as per the evaluation pattern of the respective agency conducting the MOOC.

(viii) MINIPROJECT

Total marks: 100, only CIA

Mini project can help to strengthen the understanding of student's fundamentals through application of theoretical concepts and to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. The introduction of mini projects ensures preparedness of students to undertake dissertation. Students should identify a topic of interest in consultation with PG Programme Coordinator that should lead to their dissertation/research project. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on three reviews, two interim reviews and a final review. A report is required at the end of the semester.

Interim evaluation: 40 (20 marks for each review), final evaluation by a Committee (will be evaluating the level of completion and demonstration of functionality/specifications, clarity of presentation, oral examination, work knowledge and involvement): 35, Report (the committee will be evaluating for the technical content, adequacy of references, templates followed and permitted plagiarism level is not more than 25%): 15, Supervisor/Guide: 10

(ix) RESEARCH PROJECT/DISSERTATION

Research Project: Students choosing track 2 shall carry out the research project in their parent Institution only under the guidance of a supervisor assigned by the DLAC.

Dissertation: All categories of students in track 1 are to carry out the dissertation in the Institute they are studying or can work either in any CSIR/Industrial R&D organization/any other reputed Institute which have facilities for dissertation work in the area proposed.

Dissertation outside the Institute: For doing dissertation outside the Institution, the following conditions are to be met:

- They have completed successfully the course work prescribed in the approved curriculum up to the second semester.
- The student has to get prior approval from the DLAC and CLAC.
- Students availing this facility should continue as regular students of the parent institute itself.
- Facilities required for doing the dissertation shall be available in the Organization/Industry (A certificate stating the facilities available in the proposed organization and the time period for which the facilities shall be made available to the student, issued by a competent authority from the Organization/Industry shall be submitted by the student along with the application).
- They should have an external as well as an internal supervisor. The internal supervisor should belong to the parent institution and the external supervisor should be Scientists or Engineers from the Institution/Industry/ R&D organization with which the student is associated for doing the dissertation work. The external supervisor shall be with a minimum post graduate degree in the related area.
- The course work in the 3rd semester is to be completed as per the curriculum requirements (i) MOOC can be completed as per the norms mentioned earlier (ii) Audit course are to be carried out either in their parent Institution or by self-learning. However, for self-learning students, all assessments shall be carried out in their parent Institution as in the case of regular students.
- The student has to furnish his /her monthly progress as well as attendance report signed by the external guide and submit the same to the concerned Internal guide.
- The external guide is to be preferably present during all the stages of evaluation of the dissertation.

Internship leading to Dissertation: The M. Tech students who after completion of 6 to 8 weeks internship at some reputed organization are allowed to continue their work as dissertation for the third and fourth semester after getting approval from the DLAC. Such students shall make a brief presentation regarding the work they

propose to carry out before the DLAC for a detailed scrutiny and to resolve its suitability for accepting it as an M.Tech dissertation. These students will be continuing as regular students of the Institute in third semester for carrying out all academic requirements as per the curriculum/regulation. However, they will be permitted to complete their dissertation in the Industry/Organization (where they have successfully completed their internship) during fourth semester.

Dissertation as part of Employment: Students may be permitted to discontinue the programme and take up a job provided they have completed all the courses till second semester (FE status students are not permitted) prescribed in the approved curriculum. The dissertation work can be done during a later period either in the organization where they work if it has R & D facility, or in the Institute. Such students should submit application with details (copy of employment offer, plan of completion of their project etc.) to the Dean (PG) through HoD. The application shall be vetted by CLAC before granting the approval. When the students are planning to do the dissertation work in the organization with R & D facility where they are employed, they shall submit a separate application having following details:

- Name of R&D Organization/Industry
- Name and designation of an external supervisor from the proposed Organization/Industry (Scientists or Engineers with a minimum post graduate degree in the related area) and his/her profile with consent
- Name and designation of a faculty member of the Institute as internal supervisor with his/her consent
- Letter from the competent authority from the Organization/Industry granting permission to do the dissertation
- Details of the proposed work
- Work plan of completion of project

DLAC will scrutinize the proposal and forward to CLAC for approval.

When students are doing dissertation work along with the job in the organization (with R & D facility) where they are employed, the dissertation work shall be completed in four semesters normally (two semesters of dissertation work along with the job may be considered as equivalent to one semester of dissertation work at the Institute). Extensions may be granted based on requests from the student and recommendation of the supervisors such that he/she will complete the M. Tech programme within four years from the date of admission as per the regulation. Method of assessment and grading of the dissertation will be the same as in the case of

regular students. The course work in the 3rd semester for such students are to be completed as per the curriculum requirements (i) MOOC can be completed as per the norms mentioned earlier (ii) Audit course are to be carried out either in their parent Institution or by self learning. However, for self learning students, all assessments shall be carried out in their parent Institution as in the case of regular students.

Mark Distribution:

Phase 1: Total marks: 100, only CIA

Phase 2: Total marks: 200, CIA = 100 and ESE = 100 marks

(x) TEACHING ASSISTANCESHIP (TA)

All M.Tech students irrespective of their category of admission, shall undertake TA duties for a minimum duration as per the curriculum. Being a TA, the student will get an excellent opportunity to improve their expertise in the technical content of the course, enhance communication skills, obtain a hands-on experience in handling the experiments in the laboratory and improve peer interactions.

The possible TA responsibilities include the following: facilitate a discussion section or tutorial for a theory/ course, facilitate to assist the students for a laboratory course, serve as a mentor for students, and act as the course web-master. TAs may be required to attend the instructor's lecture regularly. A TA shall not be employed as a substitute instructor, where the effect is to relieve the instructor of his or her teaching responsibilities (specifically prohibited by University Policy).

For the tutorial session:

(i) Meet the teacher and understand your responsibilities well in advance, attend the lectures of the course for which you are a tutor, work out the solutions for all the tutorial problems yourself, approach the teacher if you find any discrepancy or if you need help in solving the tutorial problems, use reference text books, be innovative and express everything in English only.

(ii) Try to lead the students to the correct solutions by providing appropriate hints rather than solving the entire problem yourself, encourage questions from the students, lead the group to a discussion based on their questions, plan to ask them some questions be friendly and open with the students, simultaneously being firm with them.

(iii) Keep track of the progress of each student in your group, give a periodic feedback to the student about his/her progress, issue warnings if the student is

consistently under-performing, report to the faculty if you find that a particular student is consistently underperforming, pay special attention to slow-learners and be open to the feedback and comments from the students and faculty.

(iv) After the tutorial session you may be required to grade the tutorials/assignments/tests. Make sure that you work out the solutions to the questions yourself, and compare it with the answer key, think and work out possible alternate solutions to the same question, understand the marking scheme from the teacher. 3. Consult the teacher if are and make sure that you are not partial to some student/students while grading. Follow basic ethics.

Handling a laboratory Session:

(i) Meet the faculty – in- charge a few days in advance of the actual lab class and get the details of the experiment, get clarifications from him/her regarding all aspects of the experiment and the expectations, prepare by reading about the theoretical background of the experiment, know the physical concepts involved in the experiment, go to the laboratory and check out the condition of the equipment/instrumentation, perform the laboratory experiment at least once one or two days before the actual laboratory class, familiarize with safety/ security aspects of the experiment / equipment/laboratory, prepare an instruction sheet for the experiment in consultation with the faculty, and keep sufficient copies ready for distribution to students for their reference.

(ii) Verify condition of the equipment/set up about 30 minutes before the students arrive in the class and be ready with the hand outs, make brief introductory remarks about the experiment, its importance, its relevance to the theory they have studied in the class, ask the students suitable questions to know there level of preparation for the experiment, discuss how to interpret results, ask them comment on the results.

(iii) Correct/evaluate/grade the submitted reports after receiving suitable instructions from the faculty in charge, continue to interact with students if they have any clarifications regarding any aspect of the laboratory session, including of course grading, Carefully observe instrument and human safety in laboratory class, Preparing simple questions for short oral quizzing during explanation of experiments enables active participation of students, facilitate attention, provides feedback and formative assessment.

POINTS TO REMEMBER

1. Arrange an awareness programme to all M.Tech students on day 1 regarding the curriculum and the regulation.
2. Make them aware about two tracks and its distinct features.
3. The departments should prepare the list of MOOC courses suitable to their programmes and encourage the students to complete at the earliest.
4. Make a tie up with industries by the middle of semester for Industry Electives. While choosing the Industry and the Industry electives, it should be ensured that the programme is relevant and updated in that discipline. The Industry expert handling the elective shall be a postgraduate degree holder. The evaluation procedure shall also be clearly explained to them.
5. If nearby Industries are not available, encourage all departments to offer courses for other disciplines that enrich interdisciplinary research.
6. Each department offering M.Tech programme should be careful in selecting the miniproject in semester 2. The miniproject should lead to dissertation/research project.
7. The departments should invite the Industries/research organizations during first semester and inform them about the mandatory 6-8 weeks internship that the students should undergo after their second semester. The possibility of doing their dissertation at the Industry shall also be explored. They should also be made aware about the evaluation procedure of the Internships. They may also be informed that it is possible to continue internship provided if it leads to their dissertation. Proposals may be collected from them for allotting to students according to their fields of interest.
8. Make sure that all internal assessments and the end semester examinations to be conducted by the respective Institutions are carried out as per the assessment procedure listed in the curriculum. Any dilution from the prescribed procedure shall be viewed seriously.
9. Teaching assistance shall be assigned to all students as per the curriculum. However, a TA shall not be employed as a substitute instructor, where the effect is to relieve the instructor of his or her teaching responsibilities (strictly prohibited by University Policy).
10. The possible TA responsibilities include the following: facilitate a discussion section or tutorial for a theory/ course, facilitate to assist the students for a laboratory course, serve as a mentor for students, and act as the course web-master