

R23 M. Tech.

Academic Regulations



Anil Neerukonda Institute of Technology & Sciences
(Autonomous)

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VISION AND MISSION OF ANITS

Vision

ANITS envisions to emerge as a world-class technical institution whose products represent a good blend of technological excellence and the best of human values.

Mission

To train young men and women into competent and confident engineers with excellent communicational skills, to face the challenges of future technology changes, by imparting holistic technical education using the best of infrastructure, outstanding technical and teaching expertise and an exemplary work culture, besides molding them into good citizens.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- PEO -1 To enable the students to address the challenges faced in mechanical and other allied streams with a solid foundation on the principles of mechanical engineering, mathematics, sciences and with good knowledge in modern computational, analytical and simulation tools and techniques.
- PEO -2 To educate the students to design, construct, manage and develop mechanical engineering systems with a research orientation, in a way such that the systems are strong technically, viable economically and accepted socially to enhance quality of life.
- PEO -3 To enable the students to communicate effectively to excel in their profession, pursue life-long learning, good at teamwork and adhere to ethics to achieve their career and organizational goals.

PROGRAM OUTCOMES (POs)

- PO-1 An ability to independently carry out research /investigation and development work to solve practical problems.
- PO-2 An ability to write and present a substantial technical report/document.
- PO-3 Students should be able 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.

ACADEMIC REGULATIONS FOR M.TECH PROGRAMME

W.E.F.THE ADMITTED BATCH OF 2023-24

I. Admissions:

Admissions into first year of M.Tech Programme of the Institute will be as per the norms stipulated by Andhra University & Andhra Pradesh State Council for Higher Education (APSCHE), Govt. of Andhra Pradesh.

II. Programmes Offered:

The following are the M.Tech Programmes offered by the Institute:

01. Food Processing Technology - Chemical Engineering Department
02. Soil Mechanics - Civil Engineering Department
03. Data Science - CSE (AI&ML) Department
04. AI&ML - CSE (AI&ML, DS) Department
05. VLSI & Embedded Systems – ECE Department
06. Control Systems –EEE Department
07. Machine Design–Mechanical Engineering Department

III. Structure of the M.Tech Programme:

The normal duration of the course is 2 academic years for M.Tech Degree. Candidates should pursue a regular course of study, as detailed below, for not less than two academic years which consists of 4 semesters and should fulfill the academic requirements and pass all the prescribed examinations for the award of the degree.

The curriculum of M.Tech programme is designed to have a total of about 68 credits to get the degree awarded. However, the credits which a student can forego will be in accordance with the mandatory courses and electives offered by the individual departments.

R-23 MODEL COURSE STRUCTURE
M.TECH (Machine Design)
DEPT. OF MECHANICAL ENGINEERING: ANITS

I Year – I Semester

Course Code	Title of the Course	Category	Periods per week			Max. marks		Total Marks	Credits
			L	T	P	Sess.	End Exam		
23MD111	Theory Subject – I	PC	3	0	0	40	60	100	3
23MD112	Theory Subject – II	PC	3	0	0	40	60	100	3
23MD113	Professional Elective – I	PE	3	0	0	40	60	100	3
23MD114	Professional Elective – II	PE	3	0	0	40	60	100	3
23MD115	Research Methodology & IPR	MC	3	0	0	40	60	100	2
23MD116	Laboratory – I	PC	0	0	4	50	—	50	2
23MD117	Laboratory – II	PC	0	0	4	50	—	50	2
23MD118	Constitution of India	Audit	2	0	0	50	—	50	0
Total			17	0	8	350	300	650	18

I Year – II Semester

Course Code	Title of the Course	Category	Periods per week			Max. marks		Total Marks	Credits
			L	T	P	Sess.	End Exam		
23MD121	Theory Subject – III	PC	3	0	0	40	60	100	3
23MD122	Theory Subject – IV	PC	3	0	0	40	60	100	3
23MD123	Professional Elective – III	PE	3	0	0	40	60	100	3
23MD124	Professional Elective – IV	PE	3	0	0	40	60	100	3
23MD125	Laboratory – III	PC	0	0	4	50	—	50	2
23MD126	Laboratory – IV	PC	0	0	4	50	—	50	2
23MD127	Seminar-I	SC	0	0	2	50	—	50	2
23MD128	English for Research Paper Writing	Audit	2	0	0	50	—	50	0
Total			14	0	10	360	240	600	18

Professional Elective–I: A. Integrated Computer Aided Design
 B. Pressure Vessel Design
 C. Fatigue, Creep & Fracture Mechanics
 D. Design Engineering

Professional Elective–II: A. Robotics
 B. Computational Methods in Engg.
 C. Advanced Optimization Techniques
 D. Vehicle Dynamics

Professional Elective–III: A. Advanced Mechanics of Solids
 B. Mechatronics
 C. Computational Fluid Dynamics
 D. Tribology

Professional Elective – IV: A. Gear Engineering
 B. Reliability Engineering
 C. Condition Monitoring & Signal analysis
 D. Composite Materials

II Year – I Semester

Course Code	Title of the Course	Category	Periods per week			Total	Max. marks		Total Marks	Credits
			L	T	P		Sess.	End Exam		
			23MD211	MOOCs-I	OE		0	0		
23MD212	MOOCs-II	OE	0	0	0	0	100	—	100	3
23MD213	Dissertation Phase-I	PR	0	0	20	20	100	—	100	10
Total			0	0	20	20	300	—	300	16

II Year – II Semester

Course Code	Title of the course	Category	Periods per week			Total	Max. Marks		Total Marks	Credits
			L	T	P		Sess.	End Exam		
			23MD221	Dissertation Phase-II	PR		0	0		
Total			0	0	32	32	100	100	200	16

The prerequisite for submission of the M Tech thesis is that one should communicate his/her work to any referred journal or Publication in a conference/journal.

IV. Duration of the Programme:

The duration of the programme is 2 academic years consisting of 2 semesters in each academic year. A student is permitted to complete the Programme in a stipulated timeframe of 4 consecutive academic years from the date of initial admission and if fails will forfeit this seat in M. Tech Programme.

V. Medium of Instruction:

The medium of instruction and examination is English.

VI. Minimum Instruction Days:

Each semester normally consists of a minimum of 16weeks of instruction.

VII. Academic Calendar:

The dates of all important events, such as commencement of class work, examinations, vacations, etc., during the academic year will be specified in the Academic Calendar of the Institute, as approved by the Academic Council.

VIII. Examinations & Evaluation Process:

The performance of a student in each semester shall be evaluated course-wise with a maximum of 100 marks each for theory and practical courses.

(a) Theory Course:

For all lecture based theory courses, the assessment shall be for 40 marks through internal evaluation and 60 marks through external semester-end examination of three hours duration.

The sessional marks shall be awarded through internal evaluation by the teachers concerned based on the continuous assessment which includes class tests, quiz, viva-voce, assignments, student regularity, two mid-examinations etc., according to a scheme notified by the department at the beginning of the semester.

Out of the 40 internal evaluation marks, 20 marks are assigned for 2 internal- mid exams, 10 marks are assigned for assignments, 5 marks are assigned for projects/case studies/quiz/tests and 5 marks are assigned for attendance. The average of 2 internal-mid exams is considered for 20 marks.

Under any circumstances, no re examination shall be conducted for the internal mid examinations.

External evaluation:

The question paper shall be set externally and the answer scripts are valued through a double valuation system.

The average of the two valuations will be taken for award of marks. In case, the difference of the marks obtained in the two valuations is more than 20% then a third examiner shall value the script. Out of the three valuations, the average of marks obtained in third valuation and the marks obtained nearer to third valuation out of first two valuations shall be considered. No revaluation for any subject/course shall be entertained as already double valuation system is in existence. However, recounting is allowed on the request of the candidate on payment of specified fee. Challenge valuation shall also be entertained on payment of specified ee.

(b) Laboratory Course:

Each student will perform about 10 to 12 experiments in each laboratory course. Laboratory course will be evaluated for 100 marks, out of which 50 marks are for external examination and 50 marks are for internal evaluation. The internal marks are awarded based on continuous assessment, record work, and internal lab examination and student regularity. The external examination will be conducted by two examiners, one of them being laboratory class teacher as internal examiner (nominated by the Principal on recommendation of HOD) and an external examiner nominated by the Principal from the panel of experts recommended by the HOD.

A candidate shall be declared to have passed in any theory subject/course if he secures not less than 40% in external theory examination and also a minimum of 50% of total marks of that course which assures a minimum of 'E' grade.

A candidate shall be declared to have passed in any practical course if he secures not less than 50% of total marks of that course which assures a minimum of 'E' grade.

Any student appearing for the semester-end practical examination is eligible only if he submits the bona-fide record certified by the laboratory class teacher and the HOD.

(C) Thesis Work:

The thesis work shall be carried out in two semesters of one full academic year. The students will be allotted for thesis by the Department committee to various faculty members who act as guides. However, a student can carry-out his thesis work either in the Department or in any other industry / research institute. In any such request to carry out thesis work outside the college, the permission of the Principal and an internal guide is mandatory. Such students should report to the internal guide once in a week essentially through mail or other communication.

The progress report of such work is to be submitted by the guide/external guide every month to the HOD. If the work is not found satisfactory, the HOD has the right to call back the student with the permission of the Principal. In any case the time and conditions for submission of the thesis will be same as for the regular candidates working in the college.

The third semester work is evaluated internally by the committee nominated by the HOD consisting a minimum of four members (concerned in area of specialization) including the HOD. If the work is not satisfactory, the candidate has to improve to the satisfaction of the committee within one month from the end of the semester to carry on his fourth semester work. If he fails to satisfy the committee in the second attempt he has to get readmitted into the third semester as per college norms. The grades will be awarded just as in the case of laboratory work. An internal viva voce by a committee nominated by the HOD is a prerequisite for the submission of the thesis. The fourth semester evaluation will be done through the viva voce examination on the thesis by a board consisting of the following four examiners after submission of the thesis by the candidate duly certified by the Guide and the HOD.

1. The Head of the Department as Chairman
2. Senior Professor in the Department
3. Internal Guide and External Guide (if any)
4. External examiner nominated by the Principal from a panel recommended by the HOD.

The panel of the external subject experts shall be submitted to the Principal by the HOD in mutual consent with the guide and other subject experts of the Department.

The valuation of the thesis shall be as specified in the scheme of examination of the laboratory course.

If the candidate fails in the viva voce examination of the thesis he has to reappear for the viva-voce. The candidate has to bear the charges for re-conducting the viva-voce.

The prerequisite for submission of the M.Tech thesis is that one should have published a paper in reputed international journal/proceedings of an annual conference.

IX. Attendance Regulations:

Attendance of a student is computed by considering total number of periods conducted in all courses as the denominator and the total number of periods actually attended by the student in all courses, as the numerator. It is desirable for a student to put in 100% attendance in all the subjects. However, a candidate shall be permitted to appear for the semester end examination provided he/she maintains a minimum of 75% overall attendance in the semester.

The shortage of attendance on medical grounds can be condoned up to a maximum of 9% provided the student puts in at least 66% attendance and provided the Principal is satisfied with the genuineness of the reasons. The Medical Certificates are to be submitted to the Head of the Department when the candidate reports to the classes immediately after the leave. Certificates submitted afterwards shall not be entertained.

Condonation fee as fixed by the college for those who put in attendance between $\geq 66\%$ and $< 75\%$ shall be charged before the semester-end examinations.

In the case of students who participate in co-curricular, extra-curricular activities like student seminars, N.S.S, N.C.C, Inter-collegiate tournaments and any such other activities involving the representation of the Institute, with the prior approval of the Principal, the candidate may be deemed to have attended the classes during the actual period of such activity, solely for the purpose of attendance.

A student, who could not satisfy the minimum attendance requirement of 66% in any semester, shall be declared 'Detained'. He/she is not eligible to appear for the semester end examinations. He will not be promoted to the next semester and shall have to repeat that semester with the next batch(es) of students. Such students, who are detained and seek readmission, should submit undertaking/declaration that they will abide by the regulations existing at the time of readmission.

X. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No. IX.

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory subject if only he secures not less than 40% marks in the semester-end examination and a minimum of 50% marks in the sum of the internal evaluation and semester-end examination taken together. In the labs/projects, the student should secure a minimum of 50% marks in the external examination and a minimum of 50% marks in the sum of internal evaluation and external examination evaluation taken together.
- ii. A student will be promoted to the next semester, if only he satisfies the minimum.
- iii. Students, who fail to complete their two year course study within four academic years from the year of their admission or fail to acquire the credits stipulated for the course shall forfeit their seat in M.Tech course and their admission shall stand cancelled.

XI. Award of Grades:

The absolute grading system is adopted as follows:

S.No.	Range of Marks { % }	Grade	Description	Grade Points
1	90-100	O	Outstanding	10
2	80-89	A	Excellent	9
3	70-79	B	Very Good	8
4	60-69	C	Good	7
5	55-59	D	Fair	6
6	50-54	E	Satisfactory	5
7	49 and below	F	Fail	0
8	The grade 'I' represents absent (Subsequently changed into pass or higher grades.)	I	Absent	0

The performance of a student at the end of the each semester is indicated in terms of Semester Grade Point Average (SGPA). The SGPA is calculated as below:

$$\text{SGPA} = \frac{\sum (\text{Credits of a course} \times \text{Grade points awarded for a course})}{\sum (\text{Credits of a course})}$$

SGPA is calculated for the candidates who have passed in all the courses in that semester.

Cumulative Grade Point Average (CGPA) will be calculated from II semester onwards upto the final semester and its calculation is similar to that of SGPA, considering all the courses offered from the first semester onwards.

CGPA is calculated for those who clear all the courses in all the previous semesters.

XII. Award of Class:

For the award of class, a total of best 68 credits are considered. A candidate, who becomes eligible for the award of M.Tech Degree, shall be placed in one of the following classes.

S.No.	Class	CGPA
1	First Class with Distinction	7.5 or more*
2	First Class	6.5 or more but less than 7.5
3	Second Class/Pass	5.0 or more but less than 6.5

***First class with Distinction will be awarded only to those students who clear all the subjects of the program in first attempt of regular examinations.**

The CGPA can be converted to aggregate percentage by multiplying CGPA with 10, in case of requirement by any other university or for any other purpose.

XIII. Eligibility for Award of M.Tech. Degree:

A student shall be eligible for the award of the M.Tech degree if he/she fulfils all the following conditions:

- 1) Registered and successfully completed all the components prescribed for eligibility in the programme of study to which he/she is admitted within the stipulated period,
- 2) Obtained CGPA greater than or equal to 5.0 (Minimum requirement for Pass),
- 3) No disciplinary action is pending against him/her and
- 4) Has no dues to the Institute including hostels.

XIV. Malpractices:

The Controller of Examinations/Dean of Examinations shall refer the cases of suspected malpractices in mid examinations and semester-end examinations to Malpractice Enquiry Committee constituted by the Institute. Such committee shall follow the approved scales of punishment. The Principal shall take necessary final action against the erring students based on the recommendations of the committee.

XV. Amendments to Regulations:

The Institute may, from time to time, revise, amend, or change the Regulations, Schemes of Examinations, and / or Syllabi and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the Institute.

XVI. General:

- (i) Where the words 'he', 'him', 'his', occur in the regulations, they include 'she', 'her', 'hers'.**
- (ii) The academic regulation should be read as a whole for the purpose of any interpretation.**
- (iii) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.**