



ACADEMIC REGULATIONS
GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
For all Postgraduate Programmes (M.Tech)
GR15 REGULATIONS

Gokaraju Rangaraju Institute of Engineering & Technology-2015 Regulations (GR 15 Regulations) are given hereunder. These regulations govern all the Post Graduate programmes offered by various departments of Engineering with effect from the students admitted to the programmes from 2015-16 academic year.

1. **Programme Offered:** The Post Graduate programme offered by the department is M.Tech, a two-year regular programme in that discipline.
2. **Medium of Instruction:** The medium of instruction (including examinations and reports) is English.
3. **Admissions:** Admission into the M.Tech Programme in any discipline shall be made subject to the eligibility and qualifications prescribed by the University from time to time. Admissions shall be made either on the basis of the merit rank obtained by the student in PGCET conducted by the APSCHE for M. Tech Programmes or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time.
4. **Programme Pattern:**
 - a) A student is introduced to "Choice Based Credit System (CBCS)" for which he/she has to register for the courses at the beginning of each semesters as per the procedure.
 - b) Each Academic year of study is divided into two semesters.
 - c) Minimum number of instruction days in each semester is 90.
 - d) The total credits for the Programme is 88.
 - e) Grade points, based on percentage of marks awarded for each course will form the basis for calculation of SGPA (Semester Grade Point Average) and CGPA (Cumulative Grade Point Average).
 - f) A student has a choice of registering for credits from the courses offered in the programme.
 - g) All the registered credits will be considered for the calculation of final CGPA.
5. **Award of M.TechDegree:** A student will be declared eligible for the award of the M. Tech Degree if he/she fulfills the following academic requirements:
 - a) A student shall be declared eligible for the award of M.Tech degree, if he/she pursues the course of study and completes it successfully in not less than two academic years and not more than four academic years.



- B) A Student, who fails to fulfill all the academic requirements for the award of the degree within four academic years from the date of admission, shall forfeit his/her seat in M.Tech courses.
- c) The Degree of M.Tech shall be conferred by Jawaharlal Nehru Technological University Hyderabad (JNTUH), Hyderabad, on the students who are admitted to the programme and fulfill all the requirements for the award of the degree.

6. Attendance Requirements

- a) A student shall be eligible to appear for the semester end examinations if he/she puts in a minimum of 75% of attendance in aggregate in all the courses concerned in the semester.
- b) Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester may be granted. A committee headed by Dean (Academic Affairs) shall be the deciding authority for granting the condonation.
- c) Students who have been granted condonation shall pay a fee as decided by the Academic Council.
- d) A candidate shall get minimum required attendance at least in three theory subjects in the semester to get promoted to the next semester. In order to qualify for the award of M.Tech. Degree, the candidate shall complete all the academic requirements of the subjects, as per the course structure.
- E) Students whose shortage of attendance is not condoned in any semester are detained and are not eligible to take their end examinations of that semester. They may seek re-registration for that semester when offered next with the academic regulations of the batch into which he/she gets re-registered.

7. Paper Setting, Evaluation of Answer Scripts, Marks and Assessment

- a) Paper setting and Evaluation of the Answer Scripts shall be done as per the procedures laid down by the Academic Council of the College from time to time.
- b) The following is the division of marks between internal and external evaluations.

S.no	Particulars	Internal	External	Total
1	Theory	30	70	100
2	Practical	30	70	100
3	Comprehensive Viva	-	100	100
4	Seminar	30	70	100
5	Project work	30	70	100

- c) The marks for internal evaluation per semester per theory course are divided as follows:
- For Mid written examinations: 20 Marks**
 - For Assignment: 5 Marks**
 - For Attendance: 5 Marks**
 - Total: 30Marks**
- d) **Mid-Term Written Examination:** There shall be two mid-term written examinations during a semester. The first mid-term written examination shall be conducted from the first



50 per cent of the syllabus and the second mid-term written examination shall be conducted from the remaining 50 per cent of the syllabus. The mid-term written examinations shall be evaluated for **20 marks** and average of the marks scored in the two mid-term written examinations shall be taken as the marks scored by each student in the mid-term written examination for that semester.

- e) **Assignment:** Assignments are to be given to the students and marks not exceeding 5 (5%) per semester per paper are to be awarded by the teacher concerned.
- f) **Attendance:** A maximum of 5 marks (5%) per semester per course are to be awarded on the basis of attendance one puts in. Course-wise attendance is taken for this purpose.
- g) **For Internal Evaluation in Practical/Lab Subjects:** The marks for internal evaluation are 30. Internal Evaluation is done by the teacher concerned with the help of the other staff member nominated by Head of the Department. Marks Distribution is as follows:
 - i. **Writing the program/Procedure:** 10 Marks
 - ii. **Executing the program/Procedure:** 10 Marks
 - iii. **Viva:** 05 Marks
 - iv. **Attendance:** 05 Marks
 - v. **Total:** 30Marks
- h) **For External Evaluation in Practical/Lab Subjects:** The Semester end examination shall be conducted by an external examiner and a staff member of the Department nominated by Head of the Department. Marks distribution is as follows:
 - i. **Writing the program/Procedure:** 20 Marks
 - ii. **Executing the program/Procedure:** 20 Marks
 - iii. **Viva:** 15 Marks
 - iv. **Lab Record:** 15 Marks
 - v. **Total:** 70 Marks
- i) **Evaluation of Main Project Work:** A Project Review Committee (PRC) is to be constituted by the Principal/Director with Head of the Department as the Chairman and two other senior faculty members of the department.
 - i. **Registration for Project work:** A candidate is permitted to register for the project work after satisfying the attendance requirements of all the courses (theory and practical courses) up to III Semester.
 - ii. After satisfying the registration requirements, a candidate is permitted to register for the project work after satisfying, the title, objectives and plan of action of his project work to the Project Review Committee for its approval. Only after obtaining the approval of Project Review Committee of the Department, the student can initiate the project work. Any changes thereafter in the project are to be approved by PRC. The student has to work under the guidance of both internal guide (one faculty member of the department) and external guide (from Industry not below the rank of an officer). Internal guide is allotted by the Head of the Department or Coordinator of the Project Work whereas external guide is allotted by the industrial organization in which the project is undertaken.
 - iii. The candidate shall submit status of the report in two stages at least with a gap of 20 days between them.



- iv. The work on the project shall be initiated in the beginning of the fourth semester and the duration is one semester. A candidate is permitted to submit project report only after successful completion of theory and practical courses with the approval of PRC and not earlier than 40 days from the date of registration of the project work. For the approval of PRC the candidate shall submit the draft copy of the thesis to the Head/Coordinator (through internal research guide) and shall make an oral presentation before the PRC.
- v. Two hardcopies and one soft copy of the project work (dissertation) certified by the research supervisors shall be submitted to the College/Institute.
- vi. The thesis shall be adjudicated by one external examiner selected by the Institute out of 5-member panel, submitted by the department.
- vii. The marks allotted for project work review are 100, out of which 30 are for internal and 70 for external. Internal evaluation marks are awarded by the PRC on the basis of the student's performance in the three pre-submission reviews and the external evaluation is done by the external examiner.
- viii. The marks allotted for project work and dissertation are 100, out of which 30 are for internal and 70 for external. Internal evaluation marks are awarded by the PRC on the basis of the student's performance in the three pre-submission reviews and the external evaluation is done by the external examiner. In both internal and external evaluations the student shall score at least 40% marks and an aggregate of 50% marks to pass in the project work. If the report of the examiner is favorable, Viva-voce examination shall be conducted by a Board consisting of the Supervisor, Head and the External Examiner who adjudicated the project work. The Board shall jointly evaluate the student's performance in the project work.
- ix. In case the student doesn't pass through the project work, he has to reappear for the viva-voce examination, as per the recommendations of the Board. If he fails to succeed at the second Viva-voce examination also, he will not be eligible for the award of the degree, unless he is asked to revise and resubmit the Project by the Board. Head of the Department and Project coordinator shall coordinate and make arrangements for the conduct of viva-voce examination. When one does get the required minimum marks both in internal and external evaluations the candidate has to revise and resubmit the dissertation in the time frame prescribed by the PRC. If the report of the examiner is unfavorable again, the project shall be summarily rejected.
- x. If the report of the viva-voce is not satisfactory, the candidate will retake the viva-voce examination after three months. If he fails to get a satisfactory report at the second viva-voce examination, he will not be eligible for the award of the degree, unless the candidate is asked to revise and resubmit.

8. **Recounting of Marks in the End Examination Answer Books:** A student can request for re-counting of his/her answer book on payment of a prescribed fee.
9. **Re-evaluation of the End Examination Answer Books:** A student can request for re-evaluation of his/her answer book on payment of a prescribed fee.
10. **Supplementary Examinations:** A student who has failed in an end semester examination can appear for a supplementary examination, as per the schedule announced by the College/Institute.



11. Malpractices in Examinations: Disciplinary action shall be taken in case of malpractices during Mid/ End-examinations as per the rules framed by the Academic Council.

12. Academic Requirements

- a) A student shall be deemed to have secured the minimum academic requirement in a subject if he / she secures a minimum of 40% of marks in the Semester-end Examination and a minimum aggregate of 50% of the total marks in the Semester-end examination and Internal Evaluation taken together.
- b) A student shall be promoted to the next semester only when he/she satisfies the requirements of all the previous semesters.
- c) In order to qualify for the award of M.Tech Degree, the student shall complete the academic requirements of passing in all the Courses as per the course structure including Seminars and Project if any.
- d) In case a Student does not secure the minimum academic requirement in any course, he/she has to reappear for the Semester-end Examination in the course, or re-register for the same course when next offered or re-register for any other specified course, as may be required. However, one more additional chance may be provided for each student, for improving the internal marks provided the internal marks secured by a student are less than 50% and he/she failed finally in the course concerned. In the event of taking another chance for re-registration, the internal marks obtained in the previous attempt are nullified. In case of re-registration, the student has to pay the re-registration fee for each course, as specified by the College.

E) Grade Points: A 10- point grading system with corresponding letter grades and percentage of marks, as given below, is followed

Letter Grade	Grade Point	Percentage of Marks
O (Outstanding)	10	Marks \geq 80 and Marks \leq 100
A+ (Excellent)	9	Marks \geq 70 and Marks $<$ 80
A (Very Good)	8	Marks \geq 60 and Marks $<$ 70
B+ (Good)	7	Marks \geq 55 and Marks $<$ 60
B (Above Average)	6	Marks \geq 50 and Marks $<$ 55
F (Fail)	0	Marks $<$ 50
Ab (Absent)	0	

Earning of Credit:

A student shall be considered to have completed a course successfully and earned the credits if he/she secures an acceptable letter grade in the range O-P. Letter grade 'F' in any Course implies failure of the student in that course and no credits earned.

Computation of SGPA and CGPA:

The UGC recommends the following procedure to compute the Semester Grade Point



Average (SGPA) and Cumulative Grade Point Average (CGPA):

- i) Sk the SGPA of kth semester (1 to 4) is the ratio of sum of the product of the number of credits and grade points to the total credits of all courses registered by a student,

$$SGPA (S_k) = \sum_{i=1}^n (C_i * G_i) / \sum_{i=1}^n C_i$$

Where C_i is the number of credits of the i th course and G_i is the grade point scored by the student in the i th course and n is the number of courses registered in that semester.

- ii) The CGPA is calculated in the same manner taking into account all the courses m , registered by a student over all the semesters of a programme, i.e., upto and inclusive of S_k , where $k \geq 2$.

$$CGPA = \sum_{i=1}^m (C_i * G_i) / \sum_{i=1}^m C_i$$

- iii) The SGPA and CGPA shall be rounded off to 2 decimal points.

- 13. Award of Class:** After a student satisfies all the requirements prescribed for the completion of the Degree and becomes eligible for the award of M. Tech Degree by JNTUH, he/she shall be placed in one of the following four classes:

Class Awarded		CGPA Secured
3.1	First class with distinction	CGPA > 7.75
3.2	First Class	CGPA > 6.75 and CGPA < 7.75
3.3	Second Class	CGPA \geq 6.00 and CGPA < 6.75

- 14. Withholding of Results:** If the student has not paid dues to the Institute/ University, or if any case of indiscipline is pending against him, the result of the student (for that Semester) may be withheld and he will not be allowed to go into the next Semester. The award or issue of the Degree may also be withheld in such cases.
- 15. Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities:** Transfer of students from the Constituent Colleges of JNTUH or from other Colleges/ Universities shall be considered only on case-to-case basis by the Academic Council of the Institute.
- 16. Transitory Regulations:** Students who have discontinued or have been detained for want of attendance, or who have failed after having undergone the Degree Programme, may be considered eligible for readmission to the same or equivalent subjects as and when they are offered.
- 17. General Rules**
- The academic regulations should be read as a whole for the purpose of any interpretation.
 - In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.
 - In case of any error in the above rules and regulations, the decision of the Academic Council is final.
 - The college may change or amend the academic regulations or syllabi at any time and the



changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.



GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

M.Tech (ES) PROGRAMME STRUCTURE

M.Tech (ES)

I Year-I Semester

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5072	PC	Embedded System Design	4	0	4	30	70	100
GR15D5073	PC	Microcontrollers for Embedded system Design	4	0	4	30	70	100
GR15D5074	PC	Embedded Real Time Operating Systems	4	0	4	30	70	100
	OE-I	Open Elective – I	4	0	4	30	70	100
	Elective I							
GR15D5075	PE	Software Defined Radio	4	0	4	30	70	100
GR15D5077	PE	VLSI Technology and Design						
GR15D5078	PE	Embedded Computing						
	Elective II							
GR15D5079	PE	Digital System Design	4	0	4	30	70	100
GR15D5080	PE	Soft Computing Techniques						
GR15D5081	PE	Advanced Operating Systems						
GR15D5082	Lab	Embedded C Lab	0	4	2	30	70	100
GR15D5173	SPW	Seminar – I	-	4	2	30	70	100
		Total Credits	28	8	28	240	560	800

M.Tech (ES)

I Year-II Semester

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5084	PC	Digital Signal Processors & Architectures	4	0	4	30	70	100
GR15D5085	PC	Embedded Networking	4	0	4	30	70	100
GR15D5086	PC	CPLD & FPGA Architectures and Applications	4	0	4	30	70	100
	OE – II	Open Elective – II	4	0	4	30	70	100
	Elective III							
GR15D5087	PE	Sensor and Actuators	4	0	4	30	70	100
GR15D5088	PE	Wireless Communications and Networks						
GR15D5089	PE	Network Security & Cryptography						
	Elective IV							
GR15D5090	PE	Multimedia Signal Coding	4	0	4	30	70	100
GR15D5091	PE	System on Chip Architecture						
GR15D5092	PE	Wireless LANs and PANs						
GR15D5093	Lab	Embedded System Lab	0	4	2	30	70	100
GR15D5174	SPW	Seminar – II	-	4	2	30	70	100
		Total	24	8	28	240	560	800



II Year-I Semester

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5175	SPW	Comprehensive Viva-voce	-	-	4	0	100	100
GR15D5176	SPW	Project work Review	-	-	12	30	70	100
Total			-	-	16	30	170	200

II Year-II Semester

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5177	SPW	Project work and Dissertation	-	-	16	30	70	100
Total					16	30	70	100

A student has a choice to select one Open Elective Pool I in I Semester and one Open Elective Pool II in II Semester.

Open Elective Pool-I

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5178	OE-I	E- Commerce and Applications (CSE)	4	0	4	30	70	100
GR15D5179		Enterprise Resource Planning (IT)	4	0	4	30	70	100
GR15D5180		Modern Control Theory (EEE)	4	0	4	30	70	100
GR15D5181		Computer - Oriented Numerical Methods in Engineering (CE)	4	0	4	30	70	100
GR15D5182		Advanced Computer Architecture (ECE)	4	0	4	30	70	100
GR15D5183		Operations Research (ME)	4	0	4	30	70	100

Open Elective Pool-II

Sub-Code	Group	Subject	L	P	C	Int.	Ext.	Total
GR15D5184	OE-II	Human Computer Interaction (CSE)	4	0	4	30	70	100
GR15D5185		Big Data and Analytics (IT)	4	0	4	30	70	100
GR15D5186		Neural and Fuzzy Systems (EEE)	4	0	4	30	70	100
GR15D5187		Project Management (CE)	4	0	4	30	70	100
GR15D5188		Hardware Software Co-Design(ECE)	4	0	4	30	70	100
GR15D5189		Non-Conventional Energy Resources(ME)	4	0	4	30	70	100