

**Academic Regulations (R21)**  
**COURSE STRUCTURE & DETAILED SYLLABUS**  
(CHOICE BASED CREDIT SYSTEM (CBCS))

**BACHELOR OF TECHNOLOGY**  
**(B.Tech)**

For

**B. Tech. - Regular Four Year Under Graduate Degree Programme**  
*(Applicable for the batches admitted from 2021 - 2022)*



**Balaji Institute of Technology & Science**  
*(UGC - Autonomous)*

Approved by AICTE, New Delhi, Affiliated to JNTUH  
Accredited by NAAC with A+ Grade and NBA  
Laknepally (V), Narsampet (M), Warangal District - 506331, Telangana

E-mail: [principal@bitswgl.ac.in](mailto:principal@bitswgl.ac.in)

Web: [www.bitswgl.ac.in](http://www.bitswgl.ac.in)

## FOREWORD

Balaji Institute of Technology & Science, established in the year 2001 is Approved by AICTE, New Delhi, Affiliated to JNTUH and Accredited by NBA and NAAC 'A+' Grade with 3.37 CGPA in April 2021. The institution has commenced functioning independently within the set norms prescribed by UGC and AICTE.

The performance of any reputed institution manifests the confidence that the prestigious monitoring body, in terms of upholding its spirit and sustenance of the expected standards of functioning on its own consequently facilitating the award of degrees for its students. Thus, an autonomous institution is provided with the necessary freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Balaji Institute of Technology & Science takes pride for having won the confidence of such distinguished academic bodies meant for monitoring the quality in technology education. Besides, the institution is delighted to sustain the same spirit of discharging the responsibilities that it has been conveying more than a decade to attain the current academic excellence. Consequently, statutory bodies such as the Academic Council and the Boards of Studies have been constituted under the supervision of the Governing Body of the College and with the recommendations of the JNTUH, Kukatpally, Hyderabad, to frame the regulations, course structure and syllabi for autonomous status.

The autonomous regulations, course structure and syllabi have been framed in accordance with the vision and mission of the institution along with certain valuable suggestions from professionals of various ancillary fields such as the academics, the industry, the research and all those with a noble vision to impart quality technical education and contribute in presenting full-fledged engineering and management graduates to the society.

All the faculty members, the parents and the students are requested to study all the rules and regulations carefully and approach the Principal to seek any clarifications, if needed, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments.

The cooperation of all the stakeholders is sought for the successful implementation of the autonomous system in the larger interests of the institution and for brightening the career of the students and other stakeholders.

## **BALAJI INSTITUTE OF TECHNOLOGY & SCIENCE**

### **Vision**

To be a centre for excellence in preparing the graduates professionally committed, intellectually adept and ethically balanced with high standards by imparting quality education with international standards to excel in their career to meet the challenges of the modern world and adapt to the technologically changing environment.

### **Mission**

- M1:** To strive hard to produce technically trained human resources to serve the present and future global needs by providing quality education
- M2:** To provide value based training in technological advancements and employment opportunities to students by strengthening institute's interaction with industries.
- M3:** To disseminate knowledge of need based technical education, innovative learning and research & development with holistic approach.

### **Quality Policy:**

We are committed to excellence in everything we do and strive to deliver value to the college community. We adhere to ethical standards. By our work, we demonstrate a commitment to high quality for academic, co-curricular and extracurricular areas.

### **PROGRAMME OUTCOMES (POs)**

- PO1: Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

- PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5: Modern tool usage:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Academic Regulations (R21)**  
**B.Tech. - Regular Four Year Degree Programme**  
 (For batches admitted from the academic year 2021 -22)  
 &  
**B.Tech. - Lateral Entry Scheme**  
 (For batches admitted from the academic year 2022 - 23)

**1. UNDER GRADUATE PROGRAMS OFFERED IN ENGINEERING & TECHNOLOGY**

Balaji Institute of Technology & Science, affiliated to JNTUH, offers 4 Year (8 Semesters) B.Tech. Degree Programme in the following Branches of Engineering:

S. No.	Branch Code	Branch
1	01	Civil Engineering (CE)
2	02	Electrical & Electronics Engineering (EEE)
3	03	Mechanical Engineering (ME)
4	04	Electronics and Communication Engineering (ECE)
5	05	Computer Science and Engineering (CSE)
6	56	Computer Engineering (Software Engineering)
7	66	CSE (Artificial Intelligence & Machine Learning)
8	69	CSE (Internet of Things)

**2. ADMISSION CRITERIA AND MEDIUM OF INSTRUCTIONS**

**2.1. Admission into first year of four year B.Tech. (Regular) Degree Programme:**

**2.1.1. Eligibility: A candidate seeking admission into the first year of four year B. Tech. Degree Programme should have:**

Passed Intermediate Public Examination (IPE) conducted by the Board of Intermediate Education, Telangana, with Mathematics, Physics and Chemistry as optional subjects or any equivalent examination recognized by Board of Intermediate Education, Telangana & Secured a rank in the Telangana State – Engineering, Agriculture & Medical Common Entrance Test (TS EAMCET) examination conducted by Telangana State Council for Higher Education (TSCHE) for allotment of a seat by the Convener, TSEAMCET.

**2.1.2. Admission Procedure:** Admissions are made into the first year of four year B.Tech. Degree Programme as per the stipulations of the TSCHE. (a) Category A: 70% of the seats are filled through TSEAMCET counseling. (b) Category B: 30% of the seats are filled by the Management.

## **2.2. Admission into the second year of four year B. Tech. (Regular) Degree Programme under Lateral Entry Scheme.**

**2.2.1 Eligibility:** A candidate seeking admission into the II Year i.e into III Semester B. Tech. Regular Degree Programme under Lateral Entry Scheme (LES) should have passed the qualifying examination (B.Sc. Mathematics or Diploma in concerned course) and have secured a rank at Engineering Common Entrance Test TSECET (FDH). Admissions are made in accordance with the instructions received from the Convener, TSECET and Government of Telangana State.

**2.2.2 Admission Procedure:** Admissions are made into the II year of four year B.Tech. (Regular) Degree Programme through Convenor, TSECET (FDH) against the sanctioned intake in each Programme of study as lateral entry student.

**2.3. Branch Transfers:** There shall be no Branch transfers after the completion of Admission Process.

**2.4. Medium of Instructions:** The Medium of Instructions and Examinations for the entire B.Tech. Programme will be in English only.

## **3. B.TECH. PROGRAMME STRUCTURE**

### **3.1 Admitted under Four year B. Tech. (Regular) Degree Programme:**

**3.1.1** A student after securing admission shall pursue the under graduate programme in B.Tech. for a minimum period of four academic years (8 semesters), and a maximum period of eight academic years (16 semesters) starting from the date of commencement of first year first semester, failing which, students shall forfeit their seat in B.Tech course.

**3.1.2** As per AICTE guidelines, a 3-week 'Mandatory Induction Programme' shall be offered to I-B.Tech. students to acquaint the newly admitted students with the professional environment and prepare them for the academic schedules ahead.

**3.1.3** The entire B.Tech. Programme is structured for a total of 160 credits. Distribution of credits Semester-wise is available in the respective course structure.

**3.1.4** Each student shall register and secure 160 credits (with CGPA  $\geq 5$ ) for the completion of the under graduate programme and award of the B.Tech. Degree.

### **3.2 Admitted under Lateral Entry Scheme (LES) into B. Tech. degree Programme:**

**3.2.1** After securing admission into II year B.Tech. i.e into III Semester, the LES students shall pursue a course of study for not less than three academic years (6 Semesters) and not more than six academic years (12 Semesters), failing which students shall forfeit their seat in B.Tech. Programme.

**3.2.2** The student shall register and secure 122 credits (with CGPA  $\geq 5$ ) from II year to IV year B.Tech. Programme (LES) for the award of B.Tech. Degree

**3.3** The Course Structure is designed based on the AICTE Model Curriculum (Jan-2018) for Under-Graduate Degree Courses in Engineering & Technology. UGC / AICTE specified definitions / descriptions are adopted appropriately for various terms and abbreviations used in these Academic Regulations / Norms, which are listed below

**3.3.1 Semester Scheme:** Each B.Tech. (Regular) Programme is of 4 Academic Years (8 Semesters) and B.Tech. (LES) Programme is of 3 Academic Years (6 Semesters), with the academic year being divided into two semesters of 22 weeks ( $\geq 90$  Instructional days per semester) each, each Semester having - ‘Continuous Internal Evaluation (CIE)’ and ‘Semester End Examination (SEE)’, Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated by UGC and Curriculum / Course Structure as suggested by AICTE are followed.

### 3.3.2 Credit Courses:

a) All Subjects / Courses are to be registered by a student in a Semester to earn Credits. Credits shall be assigned to each Subject / Course in a L: T: P: C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) Structure based on the following pattern:

Theory		Practical	
1 Hr. Lecture (L) per week	1 credit	1 Hr. Practical (P) per week	0.5 credit
1 Hr. Tutorial (T) per week	1 credit	2 Hrs Practical (Lab) per week	1.0 credit

All Mandatory Courses, Study Tour, Guest Lecture, etc., will not carry any Credits.

b) **Contact Hours:** Weekly contact hours – maximum of 30 hours per week (i.e. 1 hour = 60 Minutes) including credit and non-credit courses.

**3.3.3 Subject / Course Classification and Nomenclature:** BITS has followed the guidelines specified by AICTE / UGC / JNTUH. The subjects / courses offered in B.Tech. programme are broadly classified as mentioned below.

S. No.	Category	Breakup of Credits	
		AICTE	BITS
1	Humanities and Social Sciences including Management courses (HS)	12*	10
2	Basic Science Courses (BS)	25*	25
3	Engineering Science courses including Workshop, Drawing, basics of Electrical / Mechanical / Computer etc. (ES)	24*	24
4	Professional core courses (PCC)	48*	60
5	Professional Elective courses relevant to chosen specialization / branch (PE)	18*	18
6	Open subjects – Electives from other technical and /or emerging subjects (OE)	18*	09

7	Project work, seminar and internship in industry or appropriate work place / academic and research institutions in India / abroad (PRJ)	15*	14
8	Mandatory Courses: (Environmental Sciences, Induction program, Indian Constitution, Essence of Indian Traditional Knowledge, etc) (MC)	(Non - Credit)	(Non-Credit)

**\* Minor variation is allowed as per need of the respective disciplines.**

#### **4. COURSE REGISTRATION**

- 4.1** A ‘faculty advisor or counselor’ shall be assigned to each student to advise the student about the B.Tech. Programme, course structure and curriculum, choice / option for subjects / courses, based on his/her competence, progress, pre-requisites and interest.
- 4.2** The academic section of the college invites ‘registration forms’ from students before the beginning of the semester through online submission, ensuring ‘date and time stamping’.
- The online registration requests for any ‘current semester’ shall be completed before the commencement of SEEs (Semester End Examinations) of the ‘preceding semester’.
- 4.3** A student can apply for online registration, only after obtaining the ‘written approval’ from his/her faculty advisor or counselor, which should be submitted to the college academic section through the Head of the Department. A copy of it shall be retained with Head of the Department, faculty advisor and the student.
- 4.4** A student has to register for all subjects/courses in a semester as specified in the course structure and may be permitted to register one additional theory subject / course limited to 3 credits, based on the student’s progress and SGPA / CGPA, and completion of the ‘prerequisites’ as indicated for various subjects/courses, in the department course structure and syllabus contents.
- 4.5** If the student submits ambiguous choices or multiple options or erroneous (incorrect) entries during online registration for the subject(s) / course(s) under a given / specified course group / category as listed in the course structure, only the first mentioned subject / course in that category will be taken into consideration.
- 4.6** Subject / course options exercised through online registration are final and cannot be changed or inter- changed; further, alternate choices will not be considered. However, if the subject / course that has already been listed for registration by Head of the Department in a semester could not be offered due to any unforeseen or unexpected reasons, then the student shall be allowed to have alternate choice - either for a new subject (subject to offering of such a subject), or for another existing subject (subject to availability of seats), which may be considered. Such alternate arrangements will be made by Head of the Department, with due notification and time-framed schedule, within the first week from the commencement of class-work for that semester.



- 4.7** Dropping of additional registered subject / course (refer 4.4) may be permitted only after obtaining prior approval from the faculty advisor / counselor, 'within a period of 15 days' from the commencement of that semester.
- 4.8** **Open Electives:** Students have to choose one open elective wherever offered from the list of open electives given for their stream. Students should opt for open electives offered by other departments / branches only.
- 4.9** **Professional Electives:** The students have to choose six professional electives (PE-I to VI) from the list of professional electives given.
- 4.10** **Mandatory Courses (Non-Credit):** All mandatory courses wherever offered require prior registration.

## **5. SUBJECTS / COURSES TO BE OFFERED**

- 5.1** A typical Section (or Class) Strength for each Semester shall be 60. A subject / course may be offered to the students, if only a minimum 1/3 of students register to the course. The Maximum Strength of a Section is limited to 80 (60 + 1/3 of the Section Strength).
- i) More than one faculty member may offer the same subject (lab / practicals may be included with the corresponding theory subject in the same semester) in any semester. However, selection choice for students will be based on 'first come first served basis and CGPA criterion' (i.e. the first focus shall be on early on-line entry from the student for registration in that semester, and the second focus, if needed, will be on CGPA of the student).
- ii) If more entries for registration of a subject come into picture, then the concerned Head of the Department shall take necessary decision, whether or not to offer such a subject / course for two (or multiple) sections.

## **6. ATTENDANCE REQUIREMENTS**

- 6.1** A student shall be eligible to appear for the semester end examinations, if the student acquires a minimum 75% of attendance in aggregate (excluding the days of midterm examinations) for all the subjects / courses, excluding attendance in mandatory courses in that semester.
- 6.2** Condoning of shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each semester may be granted by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.
- 6.3** A stipulated fee shall be payable towards condoning of shortage of attendance.
- 6.4** Shortage of attendance below 65% in aggregate shall in no case be condoned.

**6.5** Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester. They get detained and their registration for that semester shall stand cancelled. They will not be promoted to the next semester. They may seek re-registration for all those subjects registered in that semester in which student was detained, by seeking re-admission into that semester as and when offered; in case if there are any professional electives and / or open electives, the same may also be re-registered, if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the same set of elective subjects offered under that category.

**6.6** A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same class.

**7. ACADEMIC REQUIREMENTS**

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no. 6.

**7.1** A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course, if student secures not less than 35% marks (25 out of 70 marks) in the semester end examination (SEE), and a minimum of 40% of marks in the sum total of the Continuous Internal Evaluation (CIE) and Semester, End Examination (SEE) taken together; in terms of letter grades, this implies securing C grade or above in that subject / course.

**7.2** A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to summer internship and Project courses, if student secures not less than 40% of the total marks in each of them. The student would be treated as failed, if student does not submit a report on his/her project(s), or does not make a presentation of the same before the evaluation committee as per the schedule. Student may reappear once for each of the above evaluations, when they are scheduled again; if he/she fails in such ‘one re-appearance’ evaluation also, student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

**7.3 Promotion Rules**

S. No.	Promotion	Conditions to be fulfilled
1	First Semester to Second Semester	Regular course of study of first semester.
2	Second Semester to Third Semester	(i). Regular course of study of second semester.  (ii). Must have secured at least 19 credits out of 38 credits i.e., 50% credits up to second semester from all the relevant regular and supplementary examinations whether the student takes those examinations or not.

3	Third Semester to Fourth Semester	Regular course of study of third semester.
4	Fourth Semester to Fifth Semester	(i).Regular course of study of fourth semester.  (ii) Must have secured at least 48 credits out of 80 credits i.e., 60% credits up to fourth semester, 21 credits out of 42 credits i.e., 50% up to fourth semester in case of LES from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fifth Semester to Sixth Semester	Regular course of study of fifth semester.
6	Sixth Semester to Seventh Semester	(i).Regular course of study of sixth semester.  (ii).Must have secured at least 72 credits out of 120 credits (49 credits out of 82 credits in case of LES) i.e., 60% credits up to sixth semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7	Seventh Semester to Eighth semester	Regular course of study of seventh semester.

- 7.4** A student has to register for all subjects covering 160 credits (122 credits in case of LES) as specified and listed (with the relevant course / subject classifications as mentioned) in the course structure, fulfill all the attendance and academic requirements for 160 credits (122 credits in case of LES) securing a minimum of ‘C’ grade or above in each subject, and earn all 160 credits (122 credits in case of LES) securing  $SGPA \geq 5.0$  (in each semester) and  $CGPA$  (at the end of each successive semester)  $\geq 5.0$  to successfully complete the under graduate programme.
- 7.5** If a student registers for ‘additional subjects’ (in the parent department or other departments / branches of engineering) other than those listed subjects totaling to 160 credits (122 credits in case of LES) as specified in the course structure of parent department, the performances in those ‘additional subjects’ (although evaluated and graded using the same procedure as that of the required 160 credits (122 credits in case of LES)) will not be taken into account while calculating the  $SGPA$  and  $CGPA$ . For such ‘additional subjects’ registered, % of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in regulations 6 and 7.1 to 7.4 above.
- 7.6** A student eligible to appear in the semester end examination for any subject / course, but absent from it or failed (thereby failing to secure ‘C’ grade or above) may reappear for that subject / course in the supplementary examination as and when conducted. In such cases, internal marks (CIE) assessed earlier for that subject / course will be carried over, and added to the marks to be obtained in the SEE supplementary examination for evaluating performance in that subject.

- 7.7 A student absent or failed (thereby failing to secure 'C' grade or above) may reappear in the Internal Exam (exam consists of only internal marks) for that subject / course in the supplementary examination as and when conducted.
- 7.8 A student detained in a semester due to shortage of attendance may be re-admitted when the same semester is offered in the next academic year for fulfillment of academic requirements. The academic regulations under which student has been readmitted shall be applicable. However, no grade allotments or SGPA / CGPA calculations will be done for the entire semester in which student has been detained.
- 7.9 A student detained due to lack of credits, shall be promoted to the next academic year only after acquiring the required academic credits. The academic regulations under which student has been readmitted shall be applicable.

## 8. EVALUATION - DISTRIBUTION AND WEIGHTAGE OF MARKS

- 8.1 The performance of a student in each semester shall be evaluated subject-wise / course-wise (irrespective of credits assigned) with a maximum of **100 marks**. These evaluations shall be based on **30 marks** allotted for CIE (Continuous Internal Evaluation) and **70 marks** for SEE (Semester End Examination), and a letter grade corresponding to the percentage of marks obtained shall be given.
- 8.2 Evaluation of Theory Subjects / Courses

### A) Continuous Internal Evaluation:

For theory subjects, during a semester, there shall be two mid-term examinations, two unit tests and two class assessments. Each mid-term examination of 1 hour 20 minutes consists of **Part-A**(objective type may be with Fill-in the Blanks and Multiple Choice type of questions 20\*0.5) for 10 marks and **Part-B**(subjective paper) for 10 marks. Part-B shall contain 3 questions out of which, the student has to answer 2 questions, each carrying 5 marks. The first mid-term examination shall be conducted for the first 50% of the syllabus, and the second mid-term examination shall be conducted for the remaining 50% of the syllabus.

- (i) The first unit test (will be on Unit-I & First 50% of Unit –II) and class assessment (assignments/Seminars, etc.) carrying 5 marks each should be conducted before the commencement of first mid-term examinations and submit the marks along with the first mid-I award list, the second unit test (will be on second 50% of Unit –III & Unit –IV) and class assessment (assignments/Seminars, etc.) carrying 5 marks each should be conducted before the commencement Second mid-term examinations and submit the marks along with the Second mid-II award list. Each Unit Test of 1 hour consists of 3 questions out of which, the student has to answer 2 questions, each carrying 2.5 marks.
- (ii) The total marks secured by the student in each mid-term examination are evaluated for 30 marks, final marks secured by each student in Continuous Internal Evaluation =

(70% of the better scored marks of MID-I / MID-II) + (30% of less scored marks of MID-I / MID-II).

Ex: A student secured following marks

MID-I marks = 10 out of 30

MID-II marks = 20 out of 30

The MID marks awarded will be = (70% of 20) + (30% of 10) = 14 + 3 = 17

(iii) There shall be an optional third midterm examination for absentees of any / both mid examinations:

Students who failed to attend any mid examinations only can register by paying prescribed registration fee for third mid examination which covers entire semester syllabus carrying 30 marks. Optional third mid-term examination consists of descriptive paper, shall be for 30 marks with a duration of 1 hour 30 minutes. The paper consists of 5 descriptive questions. The student has to answer all questions, each carrying 6 marks.

(iv) For evaluation of final internal marks = (70% of the better scored marks of MID-I / MID-II/MID-III) + (30% of less scored marks of MID-I / MID-II/MID-III).

#### **B) Semester End Examinations (SEE):**

The duration of SEE is 3 hours. The details of the question paper pattern are as follows:

The semester end examinations will be conducted for 70 marks consisting of two parts viz. i) Part- A for 20 marks, ii) Part - B for 50 marks.

**Part-A** is compulsory question (numbered with 1), which consists of ten sub questions (two from each unit) carrying 2 marks each.

**Part-B** consists of five questions (number starts with 2) carrying 10 marks each. Each of the question, there will be an either or choice (i.e., there will be two questions from each unit and student will answer any one of the question of their own choice)

#### **C) For subjects like Engineering Graphics/Engineering Drawing:**

The SEE shall consist of five questions carrying 14 marks each. For each question there will be an “either” “or” choice, which means that there will be two questions from each unit and the student should answer either of the two questions. There shall be no Part – A, and Part – B system.

- 8.3** Evaluation of Practical / Design / Drawing Subjects /Courses: In any semester, a student has to complete a minimum of 10 experiments / exercises in each laboratory course and get the record certified by the concerned Head of the Department to be eligible for Semester End Examination. For practical subjects, there shall be a Continuous Internal Evaluation (CIE) during the Semester for 30 internal marks and 70 marks for Semester End Examination (SEE).

**A) Continuous Internal Evaluation (CIE):**

For practical subjects there shall be a continuous internal evaluation during the semester for 30 marks and 70 marks for semester end examination. Out of the 30 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 20 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. For subjects like Engineering Graphics/Engineering Drawing internal examination of 1 hour consists of 3 questions out of which, the student has to answer 2 questions, each carrying 5 marks.

**B) Semester End Examination (SEE):**

The SEE for practical subject / course shall be conducted at the end of the semester with duration of 3 hours by one internal and one external examiner appointed by the Head of the Institution as per the recommendation of the concerned Head of the Department.

**8.4. Evaluation of Summer Internship:**

There shall be Summer Internship, in collaboration with an industry of their specialization. Students will register for Summer Internship-I& Summer Internship-II immediately after II year II semester& III year II semester examinations respectively and pursue them during summer vacations. Summer Internship-I& Summer Internship-II shall be submitted in a report form and presented before the committee in III year I semester& IV year I semester respectively. It shall be evaluated for 100 external marks. The committee consists of an external examiner; Head of the Department, supervisor of the Summer Internship and a senior faculty member of the department. There shall be no internal marks for Summer Internship.

**8.5. Evaluation of Project work:**

Student(s) shall start the Project Work during the VII Semester as per the instructions of the Project Guide / Supervisor assigned by the Head of the Department. The topics for Summer Internship and Project Stage – I shall be different from one another.

- a) The Project Work shall be carried out in two stages: Project-I (Stage – I) during VII Semester and Project-II (Stage – II) during VIII Semester. The student has to prepare two independent Project Work Reports – one each during each stage. First Report shall include the Project Work carried out under Stage – I, and the Second Report (Final Report) shall include the Project Work carried out under Stage – I and Stage – II put together. Stage – I and Stage – II of the Project Work shall be evaluated for 100 marks each.
- b) Out of the total 100 marks allotted for each stage of the Project Work, 30 marks shall be for the Continuous Internal Evaluation (CIE), and 70 marks shall be for the End Semester Viva-voce Examination (SEE).

The marks earned under CIE for both the stages of the Project shall be awarded by the Project Guide / Supervisor (based on the continuous evaluation of student's

performance during the two Project Work stages); and the marks earned under SEE shall be awarded by the Project Viva-voce Committee (based on the work carried out, report prepared and the presentation made by the student at the time of Viva-voce Examination).

- c) For the Project Stage - I, the Viva-voce shall be conducted at the end of the VII Semester by the Department Evaluation Committee comprising of the Head of the Department, One Senior Faculty member and Supervisor. The Project Stage – II Viva-voce shall be conducted by the Committee comprising of an External Examiner appointed by the Head of the Institution, Head of the Department and Project Supervisor at the end of the VIII Semester.
- d) If a student does not appear (or fails) for any of the two Viva-voce examinations at the scheduled times as specified above, he/she may be permitted to reappear for Project Stage - I and/or Project Stage - II Viva-voce examinations, as and when they are scheduled again in that semester; if he fails in such ‘one reappearance’ evaluation also, he/she has to reappear for the same in the next subsequent semester(s), as and when they are scheduled, as supplementary candidate.

**8.6 Evaluation of Mandatory Non-Credit Courses:** A student has to fulfill minimum attendance requirement for successful completion of all mandatory (non-credit) courses. A student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in the continuous internal evaluation for passing the subject/course. Letter grades, will not be counted for SGPA / CGPA computations for the award of the degree. Any student who fails to obtain the required attendance has to reregister and repeat the course as and when offered for award of the degree as per guidelines.

## 9. GRADING PROCEDURE

**9.1** Marks will be awarded to indicate the performance of the student in each theory subject, lab / practical's/design/drawing practice, Summer Internship – I & Summer Internship – II and Project Stage-I & Project Stage-II based on the percentage of marks obtained in Continuous Internal Evaluation plus Semester End Examination, both taken together, as specified in item 8 above, a corresponding letter grade shall be given.

**9.2** As a measure of the student's performance, a 10-point Absolute Grading System using the following letter grades (UGC Guidelines) and corresponding percentage of marks shall be followed.

% of Marks Secured in a Subject/Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
Greater than or equal to 90%	O (Outstanding)	10
80 and less than 90%	A+(Excellent)	9
70 and less than 80%	A (Very Good)	8
60 and less than 70%	B+(Good)	7
50 and less than 60%	B (Average)	6
40 and less than 50%	C (Pass)	5
Below 40%	F (Fail)	0
Absent	AB	0

- 9.3.** A student obtaining ‘F’ grade in any subject shall be considered ‘failed’ and will be required to reappear as ‘Supplementary Student’ in the Semester End Examination (SEE), as and when offered. In such cases, Continuous Internal Examination (CIE) in those subject(s) will remain same as those obtained earlier.
- 9.4.** A letter grade does not imply any specific % of marks.
- 9.5.** In general, a student shall not be permitted to repeat any subject/course (s) only for the sake of ‘grade improvement’ or ‘SGPA / CGPA improvement’. However, student has to repeat all the subjects / courses pertaining to that semester, if detained due to shortage of attendance.
- 9.6** A student earns grade point (GP) in each subject/ course, on the basis of the letter grade secured in that subject/ course. The corresponding ‘credit points’ (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

**Credit points (CP) = grade point (GP) x credits ... For a course**

- 9.7** A student passes the subject/ course only when **GP  $\geq$  5 (‘C’ grade or above)**
- 9.8** The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points ( $\sum$ CP) secured from all subjects/ courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to **two** decimal places. SGPA is thus computed as

$$\text{SGPA} = \{\sum_{i=1}^N C_i G_i\} / \{\sum_{i=1}^N C_i\} \dots \text{For each semester,}$$

where ‘i’ is the subject indicator index (takes into account all subjects in a semester), ‘N’ is the no. of subjects ‘**registered**’ for the semester (as specifically required and listed under the course structure of the parent department),  $C_i$  is the no. of credits allotted to the  $i^{\text{th}}$  subject, and  $G_i$  represents the grade points (GP) corresponding to the letter grade awarded for that  $i^{\text{th}}$  subject.

- 9.9** The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student in all semesters considered for registration. The CGPA is the ratio of the total credit points secured by a student in **all** registered courses in **all** semesters, and the total number of credits registered in **all** the semesters. CGPA is rounded off to **two** decimal places. CGPA is thus computed from the I year II semester onwards at the end of each semester as per the formula

$$\text{CGPA} = \{\sum_{j=1}^M C_j G_j\} / \{\sum_{j=1}^M C_j\} \dots \text{for all S semesters registered}$$

**(i.e., up to and inclusive of S semesters,  $S \geq 2$ ),**

where ‘M’ is the **total** no. of subjects (as specifically required and listed under the course structure of the parent department) the student has ‘**registered**’ i.e., from the 1<sup>st</sup> semester onwards up to and inclusive of the 8<sup>th</sup> semester, ‘j’ is the subject



indicator index (takes into account all subjects from 1 to 8 semesters),  $C_j$  is the no. of credits allotted to the  $j^{\text{th}}$  subject, and  $G_j$  represents the grade points (GP) corresponding to the letter grade awarded for that  $j^{\text{th}}$  subject. After registration and completion of I year I semester, the SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

**Illustration of calculation of SGPA:**

Course/Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	$4 \times 8 = 32$
Course 2	4	O	10	$4 \times 10 = 40$
Course 3	4	C	5	$4 \times 5 = 20$
Course 4	3	B	6	$3 \times 6 = 18$
Course 5	3	A+	9	$3 \times 9 = 27$
Course 6	3	C	5	$3 \times 5 = 15$
	21			152

$$\text{SGPA} = 152/21 = 7.24$$

**Illustration of calculation of CGPA up to 3<sup>rd</sup> semester:**

Semester	Course/Subject Title	Credits Allotted	Letter Grade Secured	Corresponding Grade Point (GP)	Credit Points (CP)
I	Course 1	3	A	8	24
I	Course 2	3	O	10	30
I	Course 3	3	B	6	18
I	Course 4	4	A	8	32
I	Course 5	3	A+	9	27
I	Course 6	4	C	5	20
II	Course 7	4	B	6	24
II	Course 8	4	A	8	32
II	Course 9	3	C	5	15
II	Course 10	3	O	10	30
II	Course 11	3	B+	7	21
II	Course 12	4	B	6	24
II	Course 13	4	A	8	32
II	Course 14	3	O	10	30
III	Course 15	2	A	8	16
III	Course 16	1	C	5	5
III	Course 17	4	O	10	40
III	Course 18	3	B+	7	21
III	Course 19	4	B	6	24
III	Course 20	4	A	8	32
III	Course 21	3	B+	7	21
	Total Credits	69		Total Credit Points	518

$$\text{CGPA} = 518/69 = 7.51$$

The above illustrated calculation process of CGPA will be followed for each subsequent semester until 8<sup>th</sup> semester. The CGPA obtained at the end of 8th semester will become the final CGPA secured for entire B.Tech. Programme.

- 9.10** For merit ranking or comparison purposes or any other listing, **only** the ‘**rounded off**’ values of the CGPAs will be used.
- 9.11** SGPA and CGPA of a semester will be mentioned in the semester Memorandum of Grades if all subjects of that semester are passed in first attempt. Otherwise the SGPA and CGPA shall be mentioned only on the Memorandum of Grades in which he / she passed his/her last exam in that semester. However, mandatory courses will not be taken into consideration.
- 9.12** For calculations listed in Item 9.6–9.11, performance in failed subjects/courses (securing F grade) will also be taken into account, and the credits of such subjects/courses will also be included in the multiplications and summations. However, mandatory courses will not be taken into consideration.

## **10 PASSING STANDARDS**

- 10.1** A student shall be declared ‘successful’ or ‘passed’ in a semester, if student secures a GP  $\geq 5$  (‘C’ grade or above) in every subject/course in that semester (i.e. when student gets an SGPA  $\geq 5.00$  at the end of that particular semester); and a student shall be declared ‘successful’ or ‘passed’ in the entire under graduate programme, only when a student gets a CGPA  $\geq 5.00$  for the award of the degree as required.
- 10.2** After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, grade earned etc.), credits earned, SGPA, and CGPA.

## **11. DECLARATION OF RESULTS**

- 11.1** Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.
- 11.2** The conversion formula from CGPA to percentage of Marks:

$$\text{Percentage of Marks} = (\text{final CGPA} - 0.5) \times 10$$

### **11.3 REVALUATION**

- i) Revaluation is allowed for only theory courses.
- ii) If the award of the revaluator varies from the original award by less than 20% of maximum marks prescribed for the course, best of the two awards thus available shall be taken as final.

- iii) If the award of the revaluator varies from the original award by more than 20% of the maximum marks prescribed for the course, the answer script will be examined by the second revaluator. If the award of the both revaluators is more than 20% of the maximum marks, then average of the two awards thus available shall be taken as final. Otherwise, best of the original award and the second revaluator award shall be taken as final.

## 12 AWARD OF DEGREE

- 12.1 After a student has satisfied the requirement prescribed for the completion of the program and is eligible for the award of B. Tech. degree, the student shall be placed in one of the following four classes based on CGPA:

Class Awarded	Grade to be Secured	Remarks
First Class with Distinction	$\geq 8.0$ CGPA	From the aggregate marks secured from 160 Credits for Regular Students and 122 Credits for Lateral Entry Students.
First Class	$\geq 6.5$ to $< 8.0$ CGPA	
Second Class	$\geq 5.5$ to $< 6.5$ CGPA	
Pass Class	$\geq 5.00$ to $< 5.5$ CGPA	
Fail	CGPA $< 5$	

- 12.2 First class with distinction will be awarded to those students who clear all the subjects in single attempt during their regular course of study by fulfilling the following conditions:

- i. Should have passed all the subjects/courses in 'first appearance' within the first 4 academic years (or 8 sequential semesters) for B.Tech. (Regular) and first 3 academic years (or 6 sequential semesters) for B.Tech. (LES) from the date of commencement of first year first semester for B.Tech. (Regular) and II year I semester i.e. III Sem. for B.Tech. (LES).
- ii. Should have secured a CGPA  $\geq 8.00$ , at the end of each of the 8 sequential semesters (6 sequential semesters for LES), starting from I year I semester (starting from II year I semester for LES) onwards.
- iii. Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason, shall be placed in 'first class with distinction'.

- 12.3 **Award of Medals:** Students fulfilling the conditions listed under item 12.2 alone will be eligible for award of 'College Ranks' and 'Medals'.

- 12.4 **Graduation Day:** The College shall have its own Annual Graduation Day for the award of Degrees issued by the University.

**12.5 Transcripts:** After successful completion of prerequisite credits for the award of degree, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee and also as per norms in vogue.

**13. WITHHOLDING OF RESULTS:**

If the student has not paid the fees to the Institute at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and the student will not be allowed to go to next higher semester. The award or issue of the degree may also be withheld in such cases.

**14. SUPPLEMENTARY EXAMINATIONS:**

Supplementary examinations for odd semester subjects will be conducted along with even semester regular examinations and vice versa.

**15. TRANSITORY REGULATIONS:**

- a) A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects / courses (or equivalent subjects/ courses, as the case may be), and same professional electives / open electives (or from set / category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).
- b) A student who has failed in any subject under any regulation has to pass those subjects in the respective regulations.
- c) The maximum credits that a student acquires for the award of degree, shall be the sum of the total number of credits secured in all the regulations of his/her study including R21 Regulations. The performance evaluation of the student will be done as per the rules and regulations applicable at the time of admission(s) regarding award of grade and/or class as the case may be.
- d) If a student readmitted to next Regulations, has any subject with 80% of syllabus common with his/her previous regulations, that particular subject in R21 Regulations will be substituted by another subject to be suggested by the Examination Results Processing Committee.
- e) Promotion Rule: Where the credits allotted to a semester/year under the regulations studied in are different from that under R21 regulations for the corresponding semester/year, the promotion rules of R21 vide section 7.3 shall be applied after normalization. Normalization is done by scaling down or up the number of credits of a semester/year under the previous regulations to equal the number of credits of the

corresponding semester/year under R21 regulations and revising the secured credits also in the same proportion.

**16 STUDENT TRANSFERS**

There shall be no transfers from other colleges / streams

**17 RULES OF DISCIPLINE**

**17.1** Any attempt by any student to influence the teachers, examiners, faculty members and staff of Controller of Examination office for undue favours in the exams, and bribing them either for marks or attendance will be treated as malpractice case and the student can be debarred from the college.

**17.2** When the performance of the student in any subject(s) is cancelled as a punishment for indiscipline, student is awarded zero marks in that subject(s).

**17.3** When the student’s answer book is confiscated for any kind of attempted or suspected malpractice the decision of the Malpractice Prevention Committee is final.

**18. MALPRACTICE**

**18.1 Malpractice Prevention Committee:**

The committee shall examine the student’s malpractice and indiscipline cases occurred, while conducting the examinations and recommend appropriate punishment to the Examination Results Processing Committee (ERPC) after taking explanation from the student and concerned invigilator as per the malpractice rules mentioned below. The committee consists of

- a) Controller of Examinations – Chairman
- b) Addl. Controller of Examinations.- Convener
- c) Subject Expert – Member
- d) Head of the Department of which the student belongs to - Member
- e) The Invigilator concerned – Member

**18.2 Malpractice Rules: Disciplinary Action for Improper Conduct in Examinations**

	<b>Nature of Malpractices/Improper conduct</b>	<b>Punishment</b>
	<b>If the student:</b>	
1(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the	Expulsion from the examination hall and cancellation of the performance in that subject only.

	subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the student which can be used as an aid in the subject of the examination)	
1(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the Principal.
3.	Impersonates any other student in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the answer book or	Expulsion from the examination hall and

	additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the chief superintendent/assistant – superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his/her person or to any of his/her relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his/her relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	disrupt the orderly conduct of the examination.	
7.	Leaves the exam hall taking away answer script or intentionally tears off the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.
8.	Possesses any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat.
9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared for including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.



11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the student has appeared for including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be referred to the ERPC for further action to award a suitable punishment.	

**19. SCOPE**

- i) The Academic Regulations should be read as a whole, for the purpose of any interpretation.
- ii) The above mentioned rules and regulations are applicable in general to both B.Tech. (Regular) and B.Tech. (LES), unless and otherwise specific.
- iii) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman of the Academic Council is final.

**20. REVISION AND AMENDMENTS TO REGULATIONS**

The Academic Council may revise or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the dates notified by the Academic Council.