

**Lokmanya Tilak Jankalyan Shikshan Santha's**

# **Lokmanya Tilak College of Engineering**

Sector 4, Vikas Nagar, Koparkhairane, Navi Mumbai 400709

**An Autonomous Institute Affiliated to University of Mumbai**



## **ACADEMIC RULE BOOK**

**(R- 2024)**

**(Rules and Regulations for Academics & Examinations)**

**With Effect from Academic Year 2024-25**

## Preamble

Lokmanya Tilak College of Engineering (LTCE) is founded by a Nagpur-based trust known as Lokmanya Tilak Jankalyan Shikshan Sanstha (LTJSS). The Sanstha was established in 1983, by Honourable Dr. Satish Chaturvedi. At present, there are 28 educational institutes run by the Sanstha in Nagpur. The Sanstha derives its philosophy from the magnanimous mathematician, educationist, social reformer Lokmanya Bal Gangadhar Tilak, who dedicated his life for the cause of Swaraj. Lokmanya Tilak College of Engineering was established in 1994, approved by the All-India Council for Technical Education, New Delhi, recognised by the Govt. of Maharashtra, accredited by NAAC with 'A' grade and is affiliated to the University of Mumbai. Within the span of 30 years of its inception, LTCE has grown leaps and bounds in terms of popular courses being offered at U.G., P.G. and Ph.D. level. Four of its branches viz., Computer, Mechanical, Electrical and Electronics and Telecommunications Engg. have been accredited by NBA. The Institute runs the Under-graduate Programmes in Mechanical Engineering, Computer Engineering, Electronics & Telecommunication Engineering, Electrical Engineering, Computer Science & Engineering (Data Science), Computer Science & Engineering (Artificial Intelligence & Machine Learning) and Computer Science & Engineering (IoT & Cyber Security Including Blockchain Technology). Institute also offers Doctoral Programmes in Mechanical Engineering and Computer Engineering. LTCE stands steadfast in its mission of continuing efforts for the betterment of its students and society.

The National Education Policy 2020, recently implemented by the Government of India, envisions providing quality education to all young people, with the primary goal of nurturing well-rounded, thoughtful, and creative individuals. NEP 2020 also emphasizes the importance of developing character, ethical values, constitutional principles, intellectual curiosity, scientific temper, creativity, and other related virtues. The Government of Maharashtra has instructed autonomous colleges to update their curriculum and begin implementing the National Education Policy (NEP) 2020. We are fully committed to ensuring the effective and meaningful adoption of NEP 2020 in its true essence. At "Lokmanya Tilak College of Engineering", the holistic development of learners has always been our top priority and central focus. LTCE embraced the NEP philosophy as early as 2022 wherein we have introduced the concept of Honors and Minors programs on emerging fields as per the guidelines of University of Mumbai and in 2024, we proudly graduated our first batch under this holistic curriculum. The autonomous curriculum for 2024-28 is structured in line with the recommendations of NEP 2020, AICTE, and UGC. It now includes courses in emerging technologies and multidisciplinary areas to ensure relevance to industry and practical applications. Greater focus has been placed on experiential learning to move away from rote memorization.

Sd/-  
**Dr. Sheeba P. S.**  
Dean, Academics & Research

Sd/-  
**Dr. Subhash K. Shinde**  
Principal

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# 1. Institute Information

## 1.1 Institute Vision, Mission and Objectives

### Vision:

To create technically competent and ethically responsible professionals capable of providing efficient solutions to the contemporary world.

### Mission:

We aim to excel in our continual efforts, towards being one of the most recognized institutions, by:

- Providing a conducive environment comprising high-end infrastructure and state-of-the-art laboratory facilities wherein the students, faculty and staff can collectively enhance their technical potential.
- Encouraging innovation through research activities for the benefit of society.
- Developing competent and ethical professionals responsive to change in technology.

### Objectives:

- To provide quality education for students to excel in their careers.
- To encourage the students with innovative ideas and motivate them to be entrepreneurs.
- To provide conducive environment for research activities.
- To promote co-curricular and extra-curricular activities for the overall development of the students.
- To inculcate social values and ethics among students and develop them to be socially responsible citizens.
- To strive for continuous improvements in every aspect.

## 1.2 Programs Offered

### Under Graduate (B. Tech/B.E.) Programs

Branch	Duration	Year of Establishment	Intake
Computer Engineering	4 Years	1994	180
Mechanical Engineering	4 Years	1994	60
Electrical Engineering	4 Years	1995	60
Electronics & Telecommunication Engineering	4 Years	2001	120
Computer Science and Engineering (Data Science)	4 Years	2020	60
Computer Science and Engineering (Artificial Intelligence and Machine Learning)	4 Years	2020	120
Computer Science and Engineering (IoT and Cyber Security Including Blockchain Tech)	4 Years	2020	60

## Doctorate (Ph. D.) Programs

Branch	Year of Establishment	Intake
Mechanical Engineering (Ph. D.)	2008	25
Computer Engineering (Ph. D.)	2015	10

### 1.3 Admissions

First year admissions are through Centralised Admission Process (CAP) by Directorate of Technical Education. The Institute is a Self-Financing, Hindi Linguistic Minority Institute.

LTCE has the option to enrol additional students through various government initiatives, including the Government of India Quota, and the Tuition Fee Waiver Scheme (TFWS) for economically disadvantaged groups. This inclusive approach to admissions promotes a diverse student population, bringing together individuals with a wide range of backgrounds and skills. Various scholarship schemes for the students are shown in the table:

Category	Scholarship Scheme
OBC	Government of India Post Metric Scholarship Scheme: 50% of the Tuition Fees Waived
SC/ST	Government of India Post Metric Scholarship Scheme: Tuition fees + Development fees Waived
NT/ DT / SBC/ VJ	Government of India Post Metric Scholarship Scheme: 100% of the Tuition Fees Waived
EBC	Rajarshi Chhatrapati Shahu Maharaj Shikshan Shulkh Shishyavrutti Yojana: 50% of the Tuition Fees Waived
Minority	Scholarship for Students of Minority Communities Pursuing Higher and Professional Courses: Scholarship Amount INR 50000/-
Girls Free Technical Education Scheme	For girls whose annual family income below Rs. 8 Lakhs: Only development fees need to be paid.

## 2. Credit Distribution

Illustrative Semester wise Credit distribution structure for Four Year UG Engineering Program  
– One Major, One Minor as per **Maharashtra State Govt. Resolution:**

Courses		Semester								
		I	II	III	IV	V	VI	VII	VIII	Total Credits
Basic Science Course	BSC/ESC	6-8	8-10							14-18
Engineering Science Course		8-10	4-6							12-16
Programme Core Course (PCC)	Program Courses		2	8-10	8-10	10-12	8-10	4-6	4-6	44-56
Programme Elective Course (PEC)						4	8	2	6	20
Multidisciplinary Minor (MD M)	Multidisciplinary Courses			2	2	4	2	2	2	14
Open Elective (OE) Other than a particular program				4	2	2				8
Vocational and Skill Enhancement Course (VSEC)	Skill Courses	2	2		2		2			8
Ability Enhancement Course (AEC -01, AEC-02)	Humanities Social Science and Management (HSSM)	2			2					4
Entrepreneurship/Economics/Management Courses				2	2					4
Indian Knowledge System (IKS)			2							2
Value Education Course (VEC)				2	2					4
Research Methodology	Experiential Learning Courses								4	4
Comm. Engg. Project (CEP)/Field Project (FP)				2						2
Project									4	4
Internship/ OJT								12		12
Co-curricular Courses (CC)	Liberal Learning Courses	2	2							4
<b>Total Credits (Major)</b>		<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>20-22</b>	<b>160-176</b>

### Definition of Credits:

1 Hr. Lecture (L) per week	1 Credit
1 Hr. Tutorial (T) per week	1 Credit
2 Hr. Practical (P) per week	1 Credit
1 Hr. Practical (P) per week	0.5 Credit

## 2.3 Distribution of Credits for the Institute

Type of Course	Course Code	No. of Credits as per Maharashtra Govt.	No. of credits as per LTCE
Basic Science Course	BSC	14-18	16
Engineering Science Course	ESC	12-16	14
Programme Core Course	PCC	44-56	49
Programme Elective Course	PEC	20	19
Multidisciplinary Minor	MDM	14	14
Open Elective (OE) Other than a particular program	OE	8	08
Vocational and Skill Enhancement Course	VSEC	8	10
Ability Enhancement Course (AEC -01, AEC-02)	AEC	4	03
Entrepreneurship/Economics/Management Courses	EEMC	4	04
Indian Knowledge System (IKS)	IKS	2	02
Value Education Course (VEC)	VEC	4	04
Research Methodology	ELC	4	03
Comm. Engg. Project (CEP)/Field Project (FP)	ELC	2	02
Project	ELC	4	04
Internship/ OJT	ELC	12	12
Co-curricular Courses (CC)	CC	4	03
<b>Total Credits (Major)</b>		<b>160-176</b>	<b>167</b>
<b>Total Credits (Major+ Honors/Minors)</b>		<b>178-194</b>	<b>167+18=185</b>

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**Credit Distribution**

Type of Course	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Sem VII	Sem VIII	Total Credits (LTCE)	Total Credits (As per MH GR)
Basic Science Courses (BSC)	BSC 1 (8)	BSC 2 (8)							16	14-18
Engineering Science Courses (ESC)	ESC 1 (7)	ESC 2 (4)	ESC 3 (3)						14	12-16
Program Core Courses (PCC)	-	PCC 1 (3)	PCC 2 (4) PCC 3 (4)	PCC 4 (3) PCC 5 (4) PCC 6 (4)	PCC 7 (4) PCC 8 (4) PCC 9 (3)	PCC 10 (4) PCC 11 (4)	PCC 12 (4) PCC 13 (4)		49	44-56
Program Elective Courses (PEC)					PEC 1 (4)	PEC 2 (4) PEC 3 (3)	PEC 4 (4) PEC 5 (4)		19	20
Multidisciplinary Minor (MDM)			----	MDM 1 (4)	MDM 2 (4)	MDM 3 (4)	MDM 4 (2)	----	14	14
Open Electives (OE)			OE1 (3)	OE2 (2)				OE3 (3)	08	08
Vocational & Skill Enhancement Course (VSEC)	VSEC 1 (3)	VSEC 2 (3)	VSEC 3 (2*+2) (2)		VSEC 4 (2*+2) (2)		---	----	10	08
Ability Enhancement Course (AEC)	AEC (3)								3	04
Entrepreneurship/Economics/Management Courses (EEMC)			EEMC 1 (2)	EEMC 2 (2)					4	04
Indian Knowledge System (IKS)		IKS (2)							2	02
Value Education Course (VEC)			VEC 1 (2)	VEC 2 (2)					4	04
Research Methodology								RM (3)	3	04
Comm. Engg. Project (CEP)/Field Project (FP)				Mini Project -I (1)		Mini Project -II (1)			2	02
Project							Major project -I (2)	Major Project -II (2)	4	04
Internship								Internship (12)	12	12
Co-curricular Courses (CC)	CC 1 (2)	CC 2 (1)							3	04
Total Credits	23	21	20	22	21	20	20	20	167	(160-176)

## 2.4 Abbreviations

AEC	Ability Enhancement Course
AEL	Ability Enhancement Laboratory
BSC	Basic Science Course
BSL	Basic Science Laboratory
CEP	Common Engineering Project
CC	Co-curricular courses
CIE	Continuous Internal Evaluation
CO	Course Outcomes
ELC	Experiential Learning Course
ESC	Engineering Science Course
ESE	End Semester Exam
ESL	Engineering Science Laboratory
IKS	Indian Knowledge System
L	Lecture
MDM	Multidisciplinary Minor
MSE	Mid Semester Exam
OE	Open Elective
P	Practical

PCC	Programme Core Course
PCL	Programme Core Laboratory
PEC	Programme Elective Course
PEO	Program Educational Objective
PO	Program Outcomes
T	Tutorial
TW	Term Work
VEC	Value Education Course
VSEC	Vocational and Skill Enhancement Course

## 2.5 Course Codes

The subject/course code consists of six to eight digits:

- First two digits (letters): indicates Program Name (eg., CE for Computer Engineering)
- Third to fifth digit (letter): indicates Type of Course (eg., \*\*BSC for Basic Science Course)
- Sixth digit: indicates  
C: Core/Compulsory Course  
L: Laboratory Course  
P: Project  
DO: Departmental Level Optional Course  
IO: Institute Level Optional Course  
(eg. \*\*\*\*\*C for Compulsory Course)
- Seventh digit 1/2/3...: indicates Semester (eg. \*\*\*\*\*7 for Seventh Semester)
- Eighth digit: indicates Serial Number of Course (eg., \*\*\*\*\*01 for the first course in the list)

Core/Compulsory Course	Optional Course		Laboratory Course	Project
	Department Level	Institute Level		
*****C101	*****DO601	*****IO701	*****L101	*****P401

### Program Name

- Electronics and Telecommunication Engineering: ET
- Mechanical Engineering: ME
- Computer Engineering: CE
- Electrical Engineering: EE

- Computer Science and Engineering (Data Science): DS
- Computer Science and Engineering (Artificial Intelligence & Machine Learning): AI
- Computer Science and Engineering (IoT & Cyber Security Including Blockchain Technology): IC



## 3. Academic Information

### 3.1 Program Duration

Duration for Undergraduate Program in B. Tech/BE Degree is Four Years (Eight Semesters) for First Year admission. For students admitted through lateral entry i.e., Direct Second Year (DSE), the duration is Three Years (Six Semesters). An academic year is divided into two semesters, known as the Odd and Even semesters. Generally, the Odd semester, which starts the academic year, runs from the first or second week of July to the end of November. The Even semester follows, beginning in the first or second week of January and continuing until the last week of May. Between the semesters, students have a four to six-week summer and winter break, offering time to participate in internships or industry training programs.

### 3.2 Credit Requirements for Award of Degree

- a) A total of 167 credits are required for a student to be eligible for the award of an **Undergraduate Degree in Engineering**, including a Multi-Disciplinary Minor, in accordance with the Government of Maharashtra GR dated 04/06/2024.
- b) A student shall be eligible for the award of an **Undergraduate Degree with Honours/ Minor** in Emerging Areas upon earning an additional 18 credits.
- c) These theory credits may be acquired through MOOCs the title of which will be well declared to the aspirants who will chose the same from the pool of courses.

#### 3.2.1 Honours/ Minor Degree (Extra 18 Credits)

Eligibility criteria for opting for Honours/ Minor Degree program:

- Students with no backlog in Semester I, II, and III.
- The CGPI (based on semester I, II, and III) of the students must be 7.50 and above.
- For Direct Second Year (DSE) admitted students - No backlog in semester III and CGPI must be 6.75 and above.
- The Honours/ Minor degree program can be opted only during regular engineering studies.
- The student shall complete the Honours/ Minor degree program in stipulated four semesters only.

### 3.3 Multiple Exits

The Four-year Bachelor's Multidisciplinary Engineering Degree Programme allows the students to experience the full range of holistic and multidisciplinary education in addition to a focus on the chosen major and minors as per their choices and the feasibility of exploring learning in different institutions. Students will have the flexibility to enter a programme in odd semesters and exit a programme after the successful completion of even semesters as per their future career needs. The minimum and maximum credit structure for different levels under the Four-year Bachelor's Multidisciplinary Engineering UG Programme with multiple entry and multiple exit options are as given below in Table 3.1

**Table 3.1** Credit Framework for Multiple Exit Option

Level	Exit After Semester	Credit Requirements			Qualification Title	Additional Credit requirements
		Min	Max	LTCE Credits		
4.5	II (First Year)	40	44	44	One Year <b>UG Certificate</b> in relevant discipline	<b>8 credits</b> through Skill-based vocational courses (4 Credits) and Internship/ Apprenticeship/ Project (4 Credits).
5.0	IV (Second Year)	80	88	86	Two Years <b>UG Diploma</b> in relevant discipline	<b>8 credits</b> through Skill-based vocational courses (4 Credits) and Internship/ Apprenticeship/ Project (4 Credits).
5.5	VI (Third Year)	120	132	127	Three Years <b>B. Voc.</b> in the relevant Discipline	<b>8 credits</b> through Skill-based vocational courses (4 Credits) and Internship/ Apprenticeship/ Project (4 Credits).
6.0	VIII (Fourth Year)	160	176	167	<b>B.Tech.</b> in major discipline with multidisciplinary minor	-----
6.0	VIII (Fourth Year)	160+18= 178	194	167+18= 185	<b>B.Tech.</b> in major discipline with double minor (Multidisciplinary and Emerging minor)	-----

- Students exiting the First-Year programme after securing minimum 44 credits will be awarded UG Certificate in the relevant Discipline / Subject provided they secure 8 credits in work-based vocational courses or internship / Apprenticeship offered during summer vacation in addition to 4 credits from skill-based courses earned during the first and second semester.
- Students exiting the Second Year Programme after securing minimum 86 credits will be awarded UG Diploma in the relevant Discipline / Subject provided they secure additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc) offered during summer vacation after the second year.
- Students exiting the 3-year UG program will be awarded B. Voc. in the relevant Discipline /Subject upon securing minimum 127 credits with additional 8 credits in skill-based vocational courses (skill-based courses, internship, mini projects etc.) offered during summer vacation after the sixth semester.
- Exit options shall be provided with Certification, Diploma and B. Vocational degrees to the students at the end of the second, fourth and sixth semester, respectively, in the four-year degree programme. Students will receive a Bachelor's degree with the multidisciplinary minor on successfully completing all eight semesters of the UG Programmes either at a stretch or with opted exits and re-entries. In addition to this, student will receive a Bachelor's degree with Double Minor/Honours subject to earning additional 18 credits.

### 3.4 Week-based Activities

An Academic Year consists of 52 weeks and out of these 52 weeks, 26 weeks are allotted for each Semester, for which 13 weeks are allotted for Teaching Learning Process and remaining weeks for co-curricular/extra-curricular and Exam related activities. Table 3.2 presents a week based academic calendar for a semester distributed across 26 weeks.

**Table 3.2** Week based Academic Calendar

Week	Activity
Week 1	Life skill/ UHV Course
Week 2 to 8	Teaching Learning
Week 9	Mid Semester Examination
Week 10 to 16	Teaching Learning & Submission in 16th week
Week 17	End Sem Examination for Practical and Project
Week 18	Preparation time for ESE of Theory Courses
Week 19 to 20	End Semester Examination for Theory Courses
Week 21 to 22	Result Declaration of End Semester Examination
Week 23 to 24	Preparation time for Re-examination for failed students
Week 25	Re-examination
Week 26	Result Declaration of Re-examination

## 4. Examination and Evaluation Process

As per NEP 2020, an outcome-based evaluation scheme is followed by LTCE. Continuous assessment, as advocated by **NEP 2020**, combined with diverse evaluation techniques, provides ongoing and comprehensive feedback that helps to improve the overall learning experience.

### 4.1 Examinations

Examination Scheme for First Year (FE) comprises of Internal Assessment (IA) and End Semester Examination (ESE) for Theory and Lab courses. Internal Assessment consists of Mid Semester Exam (MSE) and Continuous Internal Evaluation (CIE). Examination Scheme for Higher Classes (SE/TE/BE) comprises of two Internal Assessment Tests (IA1 & IA2), Term Work (TW) and End Semester Examination (ESE) for Theory and Lab courses.

Mid Semester Examination for FE will be conducted at Institute level during the midway of the Semester and will be based on 40 % to 50% of the syllabus carrying 20 Marks of one hour duration, whereas Continuous Internal Evaluation varies from subject to subject and various tools like, Assignments, class test, quiz, student activity, presentation, attendance, etc., are used for evaluating the students for Theory course. Tools like Lab Performance, Practical & Oral exams, attendance, etc. are used for evaluating the students for Laboratory course. Internal Assessment Tests and Term Work for SE/TE/BE will be as per the curriculum structure passed in BoS and Academic Council.

End semester Exam for FE will be conducted at the end of the Semester at Institute level and will be based on the syllabus coverage up to Mid Semester Examination (MSE) carrying 20% to 30% weightage and the syllabus covered from MSE to ESE carrying 70% to 80% weightage. ESE carries marks of 40 or 60 with exam durations of 1.5 or 2 hours respectively, depending upon the exam scheme of the respective subjects. ESE for SE/TE/BE will be as per the curriculum structure passed in BoS and Academic Council. Frequency of Examinations are shown in Table 4.1.

**Table 4.1** Frequency of Examinations

Assessment	Frequency
Mid Semester Exam (MSE)	Once in a Semester * for FE (From AY 2024-25 Onwards), SE (From AY 2025-26 Onwards), TE (From 2026-27 Onwards) and BE (From AY 2027-28 Onwards),
Internal Assessment Tests (IA1, IA2)	Twice in a Semester (TE for AY 2025-26 & 2026-27) and (BE only for AY 2025-26)
Continuous Internal Evaluation (CIE)	Continuous throughout the Semester
End Semester Examination (ESE)	Once at the end of the Semester
End Semester Re-Exam	For students failed/absent: Once after the declaration of ESE results
Supplementary (KT) Exam	For students failed/absent in Re-Exam: Once at the end of Every Academic Year

\***Re-test** to be conducted for absent students for MSE/IA1/IA2 on medical grounds with prior permission from HoDs and with valid proofs, however only **75% of total marks** obtained will be considered.

Re-Examinations are scheduled after 3 weeks from declaration of results of Regular Examinations. The Supplementary (KT) Examination is for students who were unable to clear Regular Examinations in the Odd or Even semesters.

## **4.2 Progressive Steps**

### **Students Eligibility for Examination**

To be eligible to appear for Examination, 100 % attendance is desirable, minimum should be 75%.

Mid Semester Examination will be held as per the schedule declared by the Institute. Oral/Practical/Project Examination will be held in respective laboratories in the presence of Internal and External Examiners (from another division /allied department). Laboratory Examinations are held as per the scheme. End Semester Examination will be held as per the schedule declared by the Institute.

### **Answer Script Review**

Provisional results of ESE will be declared initially. After the declaration of provisional results, interested students may come for Answer Script Review after paying the prescribed fees. Students will go through the original answer sheets and subject expert will collect the grievances, if any. Action on the grievances of answers sheets will be taken within 5 days and final results will be declared. Re-Examination will be conducted after 15 days from the declaration of results (Once in a Semester).

### **Re- Exam Answer Script Review**

After the declaration of provisional results, interested students will go through the original answer sheet, subject expert will collect the grievances, if any and results of Re-Examination will be declared within 10 days.

Failed students will appear for Supplementary (KT) Examination, scheduled at the end of the Academic Year.

### **Progression Rules (Rules for Promoting Students)**

1. A Learner will be permitted to take admission for Second Year if he/she acquires a minimum of 50 percent of the credits of Sem I and II taken together and by paying the applicable fees.
2. A Learner will be permitted to take admission for Third Year if he/she acquires a minimum of 50 percent Credits in Sem I, II, III and IV taken together and by paying the applicable fees.
3. A Learner will be permitted to take admission for Final Year if he/she acquires a minimum of 50 percent Credits in Sem I, II, III, IV, V and VI taken together and by paying the applicable fees.

### **Score Card (Mark Sheet)**

Successful/Failed students will get Score Card (Mark Sheet) with different codes as per the Examination (Regular/Re-Exam).

### 4.3 Grading of Performance

The total marks, comprising the sum of CIE, MSE, and ESE (for FE Theory Course) or CIE + Oral & Practical (for FE Lab Course) or IA+ESE (for SE/TE/BE Theory Course) or TW + Oral & Practical (for SE/TE/BE Lab Course) scores for a course, will be utilized for the grade compilation process for determining Pass /Fail status of the candidate.

The Grade Compilation Process will adhere to the guidelines given in Table 4.1 below:

**Table 4.1** Grading Scheme

SGPA/CGPA	% of Marks	Grade Result
10	85.00 - 100.00	O (Outstanding)
9	80.00 - 84.99	A+ (Excellent)
8	75.00 - 79.99	A (Very Good)
7	65.00 - 74.99	B+ (Good)
6	55.00 - 64.99	B (Above Average)
5	45.00 - 54.99	C (Average)
4	40.00 < 44.99	P (Pass)
Below 4	< 40.00	F (Fail)
Absent	Ab	Absent

#### Declaration of Results

**Semester results will be based on Semester Grade Point Average (SGPA)**

$$SGPA(S_i) = \frac{[\sum(C_i \times G_i)]}{(\sum C_i)}$$

where,  $C_i$  is the number of Credits of the  $i^{th}$  course.

$G_i$  is the grade points scored by the students in the  $i^{th}$  course.

**Cumulative Grade Point Average after completion of all Semesters of the Program (CGPA)**

$$CGPA = \frac{[\sum(C_i \times S_i)]}{(\sum C_i)}$$

where,  $C_i$  is the total number of credits of the  $i^{th}$  semester

$S_i$  is the SGPA of  $i^{th}$  Semester

## 4.4 Standard Operating Procedure (SOP)/ Guidelines for End Semester Examination

### A] Question Paper (QP) Sets Preparation and Submission

1. Appointments of paper setters, QP moderators and QP collection has to be done jointly by Chairman, BoS and Controller of Examinations.
2. **Three (03) sets** of Question Papers need to be submitted
  - i. Two sets of QP will be prepared by the internal examiner and one set by the external examiner. Convenor will act as Auditor and will moderate the QP.
  - ii. The convenor should coordinate with external examiners for QP setting meeting.
  - iii. All paper setters need to give the question paper code in the format prescribed, If the Subject Code is CSC-403, then the Question Paper Code should be CSC403\_012025.
  - iv. Paper setters should consider the learning outcomes of each module while formulating questions.
  - v. The three sets of question papers should have no more than 30% similarity, and each set should be carefully designed to avoid repetition of questions within the same paper.
  - vi. The convenor must submit 03 sets of question papers along with the solution and paper quality check auditor report to the Controller of Examinations (CoE).
3. Convenor will enter Program Name/Code, Course Code, Semester, Academic Year, QP set number, Month and Date on each Envelope, put the QP inside the envelope and seal it. Handover all the envelopes to Exam Cell and sign the document.
4. Envelope with QP sets and auditor report has to be submitted by Convenor to Exam Cell at least one week before the exam date as per Schedule given by Exam Cell.
5. In case Subject in charge/Convenor fail to submit QP Sets to Exam Cell then strict action will be taken against such faculty.
6. Random QP will be selected from these sets on Exam date by the concerned in charge appointed by the Controller of Examinations.
7. These QP sets are used for Regular and Re-Exam but not for Supplementary KT exam.
8. Faculty members whose wards are studying in any Semester of the Institute are not entitled to set or moderate the QP or evaluate the Answer Sheet for that particular Semester.

### B] Regular, Re-Exam and Supplementary (KT) Examination

1. Students scoring less than 40% Marks in the overall marks scored for Internal Assessment and End Semester Examination i.e., (MSE+CIE+ESE) or (IA+ESE) for Theory courses or (CIE + Oral & Practical) or (TW + Oral & Practical) for Lab courses are considered as failed for that particular course.
2. **Grade Penalty:** All the students who are appearing for the Re-Exam/ Supplementary (KT) Exam will get a grade penalty of one grade lower than the obtained grade.
3. Details of failed students are to be prepared by IECC and to be submitted to Exam Cell before start of Re-Exam/ Supplementary (KT) Exam. This information will be provided

to the evaluator by the Exam Cell. While awarding grades against such students' final grade will be the grade after applying grade penalty.

4. Exam malpractices/unfair means like cheating, copying, carrying electronic gadgets, unethical behaviour, etc. will be treated seriously and severe punishment will be given as follows:
  - a) **Disqualification:** In case of any malpractice found, the concerned student will be disqualified from writing the exam for that particular subject and should appear for the Re-Examination for that subject.
  - b) **Re-Exam/Supplementary (KT) Fine:** Those students caught with malpractice have to pay a fine of Rs. 5000 to appear for that particular subject Re-Examination in addition to the Exam fees.
  - c) A Disciplinary Action Committee will take final decisions regarding the reported cases of malpractice.
5. **Regular Exam** will be held in the month of November and May every year.
6. Concerned subject in charges have to check the answer papers and submit the mark sheets within 5 days from the date of Exam.
7. Provisional results of the End Semester Examination (ESE) will be declared within two weeks from the last date of the exam. Students who wish to review their answer scripts must fill out the designated Google Form and pay the prescribed fee. The **final results** will be declared within one week after the submission of the Answer Script Review Report.
8. Failed and Absent students have to fill the Exam Forms within one week after the declaration of results.
9. **Re-Exam/ Supplementary (KT) Exam** for failed students in End Semester Exam (ESE) will be held within 10 days after the submission of Exam Forms.
10. Concerned faculty members have to check the answer sheets immediately after the exam and submit the mark sheets within 2 days from the date of Exam.
11. Re-exam for failed Students in **Oral/Practical** will be conducted along with Re-Exam of Theory by the respective departments. Time Table will be prepared by IECC in consultation with Controller of Examination. The mark sheets of these exams have to be submitted to Exam Cell by the respective subject teacher within one week of the Re-Exam Date.
12. Results of Re-Exam has to be declared within one week after the submission of Marksheets.
13. Regular and Supplementary (KT) examination forms will be accepted one month prior to the commencement of the examinations.

### C] Exam Passing Criteria

1. A minimum of **40% marks**, calculated from the combined scores of **Internal Assessment** and **End Semester Examination (ESE)**, is required to pass a **theory course**.
2. A minimum of **40% marks**, calculated from the combined scores of **Continuous Internal Evaluation (CIE)/Term Work (TW)** and **Oral & Practical**, is required to pass a **laboratory course**.

Note: There will be **one head of passing** for **Internal Assessment and ESE** (theory), and **one head of passing** for **CIE/TW and Oral & Practical** (lab).

## 4.5 Gracing Scheme

(Reference: University of Mumbai UG/112 of 2015)

Grace marks (up to a maximum of 10) will be awarded to students upon successful completion of any of the following camps or activities, provided a minimum of **120 hours of participation** is fulfilled:

- **NSS (National Service Scheme) / NCC (National Cadet Corps)**
- **Sports:** Participation as a **representative or team member** in a competition that reaches the **Quarter Final stage** at the **University, State, or National level**
- **Student Council:** Membership in the **Student Council** constituted under **Section 40(2)** of the **Maharashtra Universities Act, 1994**

### Additional Provisions for Award of Grace Marks

- If a student **fails in a subject**, they may be awarded grace marks up to **3% of the maximum marks** allotted to that subject.
- If a student **fails in only one course/head of passing**, and has passed all other courses/heads of passing, the deficiency in that particular head may be condoned by awarding grace marks, limited to the **lower of the following two values**:
  - **1% of the aggregate marks** of the examination
  - **10% of the maximum marks** of the course/head of passing in which the student has failed
- **Grace marks (up to 10)** may also be awarded for the purpose of achieving a **Class or Distinction**, provided the student is **eligible** and it is their **first attempt** at the examination.

## Facilities and Concessions for Physically Challenged Students

(Reference: University of Mumbai No. UG/328 of 2017-18)

### Facilities Provided:

- Ramp access
- Wheelchair availability
- Bed (for those medically advised)
- Sign Language Interpreter (where applicable)

### Examination Concession:

- **Additional time of 20 minutes per hour** of examination is granted for writing theory papers.

## 5. Academics and Quality Assurance

### 5.1 Academic Calendar

- The Academic Calendar for the institute is prepared by the Dean (Academics) in consultation with the Heads of Departments (HoDs) and senior faculty members.
- Each department may also prepare its own Departmental Academic Calendar, coordinated by the Departmental Academic Coordinator, aligned with the institutional calendar.
- The Academic Calendar serves as a fundamental planning tool and shall be strictly adhered to throughout the academic session.
- At the beginning of each academic term, students will be informed about the academic calendar. It will also be:
  - Uploaded on the college website
  - Displayed on notice boards and other strategic locations within the campus
- The **Head of the Institute** or the **Dean (Academics)** holds the exclusive authority to make minor changes to the academic calendar, if necessary, in response to unforeseen circumstances.

### 5.2 Teaching Learning Process

The student centric teaching learning process aims at using state of the art teaching aids, conducive teaching learning ambiance, proactive approach to ensure overall academic welfare of the students and attainment of vision and mission of the programs and that of institute at large.

(i) Teaching of a course will confine to the study scheme as prescribed by the Institute from time to time. A course will have six teaching modules comprises of theory, practical and tutorial as the case may be.

- HoD(s) should allocate the subjects to the faculty members well in advance and in a transparent manner.
- Course teachers are expected to prepare Course File as per the defined format provided.
- Updated Course File should have Latest Syllabus, Program Outcomes, Program Specific Outcomes and Course Outcomes, CO-PO, CO-PSO Mapping & Attainment, Teaching Plan, Tutorial Plan and execution dates, Tutorial Sheets, Teaching Plan, Academic calendar, Time Table, Question Bank, Question Papers & Solutions with Marking scheme, Assignments, Teaching notes (Hard Copy), Advanced topics planned and execution details, details of weak & bright learners, Assessment tools, Course Exit Survey, Result Analysis, List of Books available in the library/departmental library, etc.

(ii) The course teacher will prepare teaching plan, lesson plan, and tutorial plan as per policies and guidelines of the Institute and Department so as to give justice to every component of the course.

- Teaching-Learning deliverables will include Continuous Internal Evaluation (CIE)/TW of the students on the component of the syllabus taught.
- Remedial Classes shall be conducted for academically weak/slow learners of the class.
- The course teacher may teach few components which are beyond syllabus.
- The Teaching-Learning process should make use of real-life examples/ technological issues, visit to industries, etc.
- Subject Notes /PPT(s) are to be made available to the students.

(iii) To complement the conventional teaching methods, the departments should also emphasize on following innovative teaching learning methods:

- Expert lectures are to be organized for various subjects for improving the know-how in the course.
- Video lectures of expert from IITs, NPTEL lecturers can be availed of.
- The use of ICT (Information and Communication Technology) is an essential tool of modern teaching/learning process which the students and the teachers should make use of.
- Visit of course teacher with students to the related industry for practical exposure of subject.
- Conferences, Workshops, seminars and tech fests are to be organized to update the knowledge of students.
- Seminars may be delivered by the students on latest topics.
- Study groups for courses can be formed for peer-to-peer learning.
- Practical demonstration for the subjects which are not having practical in the curriculum scheme.
- Technical quiz/ Surprise test based on syllabus of some of the core subjects may be conducted.
- Assisting weak & bright students and efforts taken for them.
- For the preparation of GATE & other competitive examinations, study forum may be formed and classes may be conducted by expert faculty.
- Tutorials are to be conducted unit-wise for numerical and design-based subjects to improve analytical skills.

(iv) Academic Records

- Attendance register must be maintained scrupulously by the course teacher, ensuring timely entry of all relevant information already prescribed in the attendance register.
- Record of extra classes, remedial classes and classes for topic beyond syllabus should be maintained.
- Average Attendance of all the students to be displayed at the end of every month.
- The list of students having low attendance should be displayed on notice board/ official WhatsApp group and be communicated to the parents.
- Faculty Mentor should counsel the students and also inform the parents regarding progress of the student and maintain the record.

## 5.3 Policy on Assessments

### (i) Policy on Internal Assessment (IA)

Policy on Internal Assessment focuses on the PDCA (PLAN, DO, CHECK, ACTION) approach where in the students shall be offered a window of equal opportunity to improve their performance on a continual basis.

Internal Assessment comprises of Mid Semester Examination (MSE)/IA and Continuous Internal Evaluation (CIE)/TW.

#### (a) Mid Semester Examination (MSE)/ IA Test

Mid Semester Examination will be conducted once in a Semester.

- Mid Semester Examination/ IA Test will be based on 40 % to 50% of the syllabus and is conducted for 20 Marks as prescribed by the institute.
- The schedule for MSE/ IA Test will be as per the dates mentioned in the academic calendar and the modus operandi of the same shall be finally decided by Heads of Departments in consultation with the Principal, Dean (Academics) and Controller of Examinations.
- The course teacher shall announce the syllabus in advance for MSE/ IA Test.
- Students who remain absent for MSE/ IA Test under emergency situation, with prior permission from HoDs, will be permitted for re-exam, however only 75% of the total marks obtained will be considered as per the rules of the institute. This provision is made for situation in which the absence is due to reason of illness, death of a near kin, attending of State or National level competitive exam, placement activities and other circumstances beyond control of the student. To avail this provision, students are required to apply to the HOD with recommendation from class teacher/academic coordinator with relevant documents. It is at the discretion of the HOD to consider the application.
- Students will follow the academic calendar for all the academic activities.
- Students should verify the MSE/ IA Test answer sheets and communicate the grievances to the Subject in charge for necessary actions.
- All the records and data bank of attendance in MSE/ IA Test, question papers, evaluated answer sheets, summary of marks sheets, and display of marks should be properly maintained for academic monitoring/academic audit.
- Result of the MSE/ IA Test should be analysed subject wise by the departments within 8 days of the declaration of the results and the concise report in the prescribed formats should be sent to Dean (academics).

#### (b) Continuous Internal Evaluation (CIE)/ Term Work (TW)

Continuous Internal Evaluation is done throughout the semester. Various evaluation tools are used for the Continuous Internal Evaluation for Theory and Practical courses.

- For theory courses, evaluation tools like, Assignments, Quiz/Open book test/Presentation, Regularity and attendance, etc., are used based on the course requirement.

- For practical courses, evaluation tools like, Lab Performance, In-Semester oral/Practical Exam during lab session, Regularity and Attendance, student activity, etc., are used based on the course requirement.

## **(ii) Policy on End Semester Examination**

End Semester Examination will be conducted once in a semester at the end of the Term.

### **Theory:**

- End semester will be based on the syllabus coverage up to Mid Semester Examination (MSE)/ IA Test carrying 20% to 30% weightage and the syllabus covered from MSE to ESE carrying 70% to 80% weightage.
- The schedule for ESE will be as per the dates mentioned in the academic calendar and the modus operandi will be as per the guidelines mentioned in the SOP for End Semester Examination.
- Students should verify the ESE answer sheets strictly on the specified dates mentioned in the academic calendar for verification of answer scripts and communicate the grievances, if any to the subject in charge for necessary actions. If a student fails to verify his/her answer sheet, then the marks obtained will be considered as the final marks and there will be no provision for revaluation of such answer sheets.
- If a student fails in ESE, he/ she can appear for the Re-Exam which will be conducted within a month after the declaration of the results.
- If a student fails in Re-Exam, he/she can appear for the Supplementary (KT) Exam which will be held at the end of the Academic Year.

### **Practical &/Oral:**

An Oral & Practical examination will be held based on the entire syllabus as per the Examination Scheme mentioned in the curriculum for the respective subjects.

Records of the students appearing for GATE/ Other Competitive examinations should be maintained and the result should be analysed to know the success rate and the performance of the students.

## **5.4 Final Year Project & Mini Projects**

The project work enables students to apply the technical, professional, and ethical skills and knowledge acquired throughout their graduation program. It allows them to demonstrate these competencies by identifying problems, analysing them, and designing appropriate solutions. Hence in the final year of the Engineering program every student has to do a project work by applying the acquired concepts and knowledge. Therefore, at the entry of seventh semester, student initiates project work with a defined group.

### **Project Topic Selection and Allocation:**

- A clear process for selecting project topics must be established and adhered to.
- Project orientation can be conducted at the end of the sixth semester.
- Students should be informed about available domains and domain experts who can provide guidance before project selection.

- It is advisable for students to consult papers from reputable conferences/journals like IEEE, Elsevier, or ACM, ensuring the references are no more than three years old for a comprehensive literature review.
- While students can draw inspiration from various sources, they should ensure that ideas are uniquely adapted to meet their project needs. They can also be encouraged to explore platforms like the Digital India portal, SIH portal, or other hackathon portals for problem identification.

The criteria for finalizing topics should include the following:

1. **Topic Selection:** Topics should be innovative, whether product-based, application-based, or research-based. Alternatively, they can aim to address deficiencies in existing systems.
2. **Technology Used:** The use of cutting-edge technology or modern tools is encouraged for the projects.

The department take care of the research and topic of interest of each student and offers flexibility to the student for formation of groups according to their choice of particular interest. However, it is advised to follow limitation of group members as prescribed by the institute. The list of guides along with their specialization may be communicated to the students at the end of sixth semester.

The following guidelines may be followed:

- *Originality:* Students should not select topics that have been worked on in the past three years.
- *Group Size:* Project teams must consist of a minimum of 2 and a maximum of 4 students.
- *Location:* Projects may be carried out at research institutions, organizations, industries, or business establishments (out-house projects).
- *Proposal Presentations:* These should be organized according to the project domains and evaluated by faculty experts in the respective areas.
- *Project Selection:* The department head, senior staff, and project coordinators will decide on the final project selections.
- *Guide Allocation:* A guide will be assigned, and students are required to submit weekly progress reports to their internal guide.
- *Progress Monitoring:* The internal guide is responsible for tracking project progress and maintaining an attendance record. These progress reports will contribute to continuous internal evaluation marks.
- *Industry Projects:* For out-house or industry-based projects, it is preferable for the internal guide to visit the project site. External members may also be invited for evaluations at various stages.

Project Coordinator should prepare the merit list of the project groups as per the policy of the department and submit it to the HoD. HoD/ Academic Coordinator/ Project Coordinator/ Guide/ should finalize the project group in coordination with the students.

The project coordinator displays the list of project groups with their selected/ allotted guides.

Progress seminars are conducted as per the schedule in academic calendar, wherein the students present their progress of the work before the project review committee. The committee evaluates their work with respect to the following rubrics:

- *Problem Quality*: The significance and impact of the selected problem.
- *Problem Definition & Feasibility*: How clearly the problem is defined and the practicality of the solution.
- *Relevance*: Alignment with the student's specialization and current industry trends.
- *Originality*: The uniqueness of the problem and approach.
- *Objective & Scope*: How clearly the project's goals and boundaries are outlined.
- *Analysis & Design Quality*: The depth and rigor of the project's analysis and design.
- *Presentation Skills*: The effectiveness of both the written and oral presentations.
- *Teamwork & Individual Contributions*: The balance between individual effort and team collaboration.

The parameters mentioned above are for general guidelines, however they may vary from department to department. The departments should ensure that the evaluation is done at individual and group levels.

- The project review committee gives valuable suggestions to carry on with the decided project.
- A project guide maintains record as per the defined format and the students meet their guides from time to time for guidance.
- The project coordinator provides guidelines for writing the final project report and the students are expected to submit it to the department within the stipulated time frame.
- The department must keep up the tradition of organizing a project exhibition in which the best project is awarded.

**Impact Analysis of Project Work:** After completion of the project work, the students develop the capacity to handle real life problems, however some prominent points about the impact are discussed:

- Students develop an ability to handle the live projects in real world problems.
- Students getting awards/ different prizes at IITs and National Level institutes.
- Students presenting their research papers on their proposed work at International and National Conferences.
- Acquired an ability to work in groups.

Qualitative norms of the project include but not limited to the following:

- I. Publication/presentation in conferences/journals
- II. Participation in Project/poster competition

## 5.5 Quality Assurance

### Quality Assurance Initiative

Quality assurance initiatives include but not limited to the following:

- Involvement of external expert in project evaluation
- Academic Audit carried out by Internal & External experts
- Faculty Development Programs
- Practical performance for students
- Developing creative lab, Industry supported lab, Incubation center, research lab, etc.
- MOUs for exchange of technical know-how, value addition.
- Professional societies chapter formation and conduction of technical activities.
- Involvement of stakeholders as partners in growth.

### Quality improvement initiative through laboratory experiments

- To enhance the practical exposure of the students, every laboratory is well equipped with the state-of-the-art equipment.
- Every laboratory to have standard operating procedure, Laboratory Manuals/ Experiment Manuals/ Machine Manuals. For experiment purpose, laboratory resources to be made available to the students.
- The standard operating procedure, safety measures, Dos and Don'ts should be displayed on a strategic place.
- List of experiments to be conducted in labs has to be displayed.
- All course teachers engaging practical should incorporate few innovative practical.
- Practical Teaching plan has to be prepared by Course Teacher in coordination with Lab In charge.

To govern the quality of practical the departments should have standard operating procedure as follows:

- Every student has to attend the laboratory in practical slot provided in the timetable in prescribed batch.
- Every student should make entry in log book.
- At the beginning, a course teacher has to explain the students about experiment.
- Course Teacher and Laboratory Assistant should take one sample reading as a demonstration for further clarification.
- Students should perform the experiments and verify the results from the course teacher. After verifying the results, students are allowed to write experiment in practical record book (journal). Student then appear for viva-voce and teacher awards the grade/marks accordingly.
- Practical record book (journal) should be checked regularly.

### Additional Measures by the Department

- Department should encourage the students to develop new experimental set- ups.

- To have greater accuracy in experiment the department should carry out the calibration of equipment by appropriate agencies.
- A regular maintenance schedule has to be followed by the department to keep the equipment in working condition.
- The department should care for those students who were absent in regular practical slots by conducting their practical in extra hours.
- Taking feedback from students about the conduction of practical.

## 5.6 Analysis of Attendance

**For Odd/Even semesters:** An analysis of monthly attendance shall be made from the start of academic session. Parents of those students having attendance below the prescribed attendance will be communicated about the same.

**Policy on Grant of Attendance:** Students as functionaries/ participants in inter/intra collegiate events may be granted attendance for the limited period during which they were preoccupied in their roles as functionaries.

Minimum attendance as per Institute guidelines is required to appear for the Exams. HoDs can permit the students having attendance of 50 %, under certain circumstances like participating in various competitions, activities/events, etc. Attendance will be granted for the period of the related activity/event. The concerned Deans/ HoD/ in-charge of the activity/event shall mention the period for which the attendance to be granted.

The students are required to submit the relevant certificates, pertaining to the cases eligible for the grant of attendance, obtained from the competent authority from within the campus or outside the campus to the Head of the Departments. The relevant applications along with certificates in this respect must be submitted to the HOD within one week of the completion of the activity.

The Head of the Department shall verify the authenticity and appropriateness of the certificates, compile the applications, prepare the data regarding grant of attendance and circulate it to all the concerned teachers.

The student will be eligible for getting the benefit of grant of attendance on above ground, only if he/she attends 50% classes, on average, engaged by all the teachers for all the subjects in given semester.

## 5.7 Mentor-Mentee Scheme

The Mentor-Mentee Scheme is to offer guidance, support, and share knowledge to help mentees grow and advance in their personal, academic, or professional journeys. The institute has a well-established mentor mentee scheme in which a group of 20 students are assigned to a faculty mentor and he/she will act as their mentor throughout their undergraduate program. The faculty mentors regularly interact with the student mentees and monitor their performance in curricular as well as extracurricular activities and guide/motivate them to improve their performance and help them to grow academically and professionally. A proper record of the Mentor-Mentee activity has to be maintained by every department.

## 5.8 Academic Planning & Monitoring System

### Teaching Load Distribution:

The teaching load (Theory and Practical) has to be appropriately allotted among the faculty members as per the cadre, expertise & specialization. The load distribution sheet is to be duly signed by all the faculty members.

### Time Table:

Time Table is to be prepared as per the teaching scheme of the Institute and departmental requirement. Central Master Time Table coordinator will prepare the same in discussion with Dean Academics and departmental Time Table coordinator.

The Time Table is to be circulated among the staff members and displayed well in advance for the students.

### Commencement of Classes:

The date of commencement of classes as per academic calendar is to be communicated to the students by means of displaying notice on the notice board, WhatsApp groups, etc., prior to the commencement of classes.

### Student Monitoring

The reporting of the students is taken note of for the first ten days to ensure regularity of the students. If a student fails to report for the majority of days, the Faculty Mentors/ Class Advisors are required to enquire about his/her absenteeism. The genuineness of absenteeism is to be confirmed from their parents.

Academic Coordinator, Class Advisor and all course teachers should inform the students about the criteria, rules and regulations for Internal Assessment and End Semester Examination (ESE).

The individual student attendance is to be checked every month. Also, the attendance has to be communicated to the parents by Faculty Mentor / Class Advisor/ Academic Coordinator. For the first month, list of students having poor attendance is communicated to the students and they are advised to improve the attendance. For the next month, the letter to the parents is communicated for the students having poor attendance and the students are warned to improve the same. A Parent Teacher Meeting also has to be arranged for the same.

### Teaching Monitoring

Teaching Plan is to be prepared by individual faculty member for the allotted subject. The faculty members are instructed to update the engaged dates in the Teaching Plan.

Faculty members will keep academic record which include the syllabus coverage, conduction of classes, student strength and other academic related issues. The submission of the record should be done fortnightly to Academic Coordinator for his/her observations and HoD for suggestions and improvements.

Daily teaching monitoring report is prepared for all the courses and submitted to the Dean (Academics) at the end of the day. The faculty members are asked for the reason for less lectures engaged / syllabus coverage or discrepancies, if any. The faculty members are asked for remedial actions to improve the status.

Updated academic documents like Teaching Plan, Tutorial Plan, and course file, and attendance register will be checked by Dean (Academics)/ Academic Coordinator.

### **Academically Weak Students**

The connotation of academically weak students means those who could not keep pace with the class room teaching needs extra attention so as to bring such students at par with the rest of the students of the class.

#### **Criteria for identifying academically weak students:**

- (i) Students having more than 50% backlog in latest declared result of End Semester Examination.
- (ii) Students securing less than 40% marks (rounded off to higher integer) in Mid Semester Examination.
- (iii) Any other appropriate criteria justified by the teacher.

#### **Measures for Academically Weak Students:**

- (i) Remedial/ Extra classes should be conducted with appropriate focus on the subject/ topic codes in which the students are found to be weak.
- (ii) Individual academic counselling.
- (iii) Doubt clearing sessions.
- (iv) Formation of study group for peer-to-peer learning.
- (v) Personal counselling through Mentoring Scheme/ Teacher guardian scheme.

Maintain the record of academically weak students and the measures taken to improve the performance.

### **Academically Bright Students**

Those students who are ahead on the learning curve and requires advanced technical and managerial know-how to position themselves on the highest pedestal of career. Such students have all calibre to push the limits and achieve something extraordinary. However, it is important that they need cutting edge and break through clues from the teachers and the institute without which their exceptional calibre and intelligence will remain precariously unexploited. Hence it is our attempt to take some extra time out of our routine which can be humanly invested into such students.

#### **Criteria for identifying academically bright students:**

- (i) Top ten scorers in the latest declared result of End Semester Examination.
- (ii) Students securing more than 75% marks (rounded off to higher integer) in Mid Semester Examination.
- (iii) Any other appropriate criteria justified by teacher.

### **Measures for Academically Bright Students:**

- Contact sessions for career planning.
- Research paper reading and discussion or seminar on the topic
- Communicating research papers in conferences/ Journals
- Preparing the students for public service commission examinations.
- Fabrication or development of new experimental set-up in the lab.
- Training programs for gaining advanced technical know-how.
- Formation of study groups mentored by bright students.

Measures mentioned are not limited to the above. Departments should have a mechanism for suggestions and action plan to implement them.

***LTCE value all our students on equal platform with all human values.***

## **5.9 Meetings of Stakeholders**

All programs should have identified Parents, Students, Faculty, Alumni and Industry Personnel/ Employers, etc. as valued stake holders. A regular meeting has to be conducted with them.

One of the primary objectives of the meeting is to make the stakeholders aware of Vision and Mission of the Departments/ Institute and to inform them about all the policies & programs of the Institute and events planned & conducted regularly.

An endeavour shall be made in the meeting to develop and maintain meaningful relations with the stakeholders so as to rope them into the specific scheme of objectives of the institute.

Every Department should organize one or two meetings in a year for all the stake holders. Meetings can be scheduled in the beginning/ middle/ end of semester or end of Academic Session depending on the requirements. The schedule of the stake holders' meeting is decided by the departments or as per the Academic Calendar.

In the meeting their suggestions are to be noted and action plan is to be prepared for implementation at departmental level.

The report of the meeting indicating the brief minutes of the meetings, the time bound actions proposed by the department, the actions expected to be taken at the institute level should be submitted to the office of the Principal within a week after the meeting. The action plan in this respect should be subsequently prepared by the HoD in consultation with the Principal/ Dean(s). The same should be implemented scrupulously and the records to be maintained.

Attendance record, feedback, action taken reports should be uniformly maintained by the departments in the prescribed formats.

The Principal/ Dean academics are to be informed about the meetings.

## 5.10 Students and Faculty Feedback

Students have a vital role in the program. Students' feedback is considered to introduce innovative practices & improve teaching learning process.

### (a) Students' Feedback of Faculty on Teaching Learning Process

Feedback in the standard format is conducted by HoD/ Dean Academics, twice in a semester. Remarks on feedback are conveyed to the respective faculty members for necessary corrective action. Corrective action taken is communicated to the office of the Principal/ Dean.

### (b) Students' Program Exit survey

Students' Program exit survey is conducted for the final semester students in the standard format by the departments. The impact analysis is carried out and a brief report regarding the corrective action taken at the department level and action to be taken at the central level is to be submitted to the office of the Principal/ Dean (Academics).

### (c) Faculty Appraisal Form

The faculty appraisal forms will be collected by the Departments from Registrar and the completed forms with the remarks/ endorsement of the Head of the Department should be sent to the office of the Principal by the last working day of each Academic Session.

### (d) Course Result Analysis

Result of the End Semester Examinations has to be analysed course-wise by the departments within one week of the declaration of the results and a concise report in the prescribed format has to be send to Dean (Academics) on or before 10th day of declaration of the results.

The result analysis for the course has to be carried out and the brief report regarding the corrective action taken at the department level and action to be taken at the institute level need to be submitted to the office of the Principal/ Dean (Academics). If required, meeting with individual teachers has to be organized. In case of very poor performance, letters are to be issued.

## 5.11 Policy on Co-Curricular and Extra-Curricular Activities

### (a) Institute Level

There shall be at least two events at the institute level. It will consist of at least one technical event, cultural events/ sports etc. Other events like workshops, Entrepreneurship Development Cell/ IIC activities will be conceived, planned, organized, executed and participated by the students of all the branches. The students of other colleges can also participate in the event.

### (b) Department level

The student association of each department should plan, organize curricular or co- curricular and extracurricular activities/ events of their interest/ relevance and provide platform for the students. These activities/ events should be strictly carried out in such a way that the teaching

of the other departments does not get hampered. If in the events, other department or college students required to participate then permission from Dean (Academics) for Co-curricular Activities and Dean (Student Affairs) for Extra-curricular, and Principal office is mandatory. They should be part of planning, execution and discipline in the campus. Dean (Student Affairs) and Registrar along with the event In-charge(s) should ensure the discipline of the students during execution of events.

### **5.12 Industrial Visits / Industrial Tour**

- Industrial visits may be arranged as prescribed for the courses suggested in the curriculum.
- Industrial visit in charges have to follow standing order of LTJSS for arranging and taking students on tours/ visits.
- A written consent should be taken from the parents who are willing to send their wards on tour.
- Official meeting of parents should be called and tour details should be informed.
- Schedule of the tour should also be given to parents for their information.
- Industry Visit In-charge should consult with HoD for the planning of the tour/visit.
- Industrial Visit In- charge has to submit the report to the office of the Principal through the HoD.

### **5.13 Visiting / Adjunct / Emeritus Faculty**

This provision facilitates:

- Involvement of Industry persons / academic experts/ Emeritus professor in teaching learning and research.
- Understanding applications of the subjects in the industry.
- Knowing the latest technology in the subject/course/program.
- Involving, Adjunct/ Emeritus faculty, as guide for the project.

Area of Interaction/ Subjects should be identified by the department. Department should also submit the schedule and details to the office. Remuneration will be paid as per norms or decided by the department in consultation with resource persons.

## 6. Code of Conduct

Code of conduct policies are in place at Lokmanya Tilak College of Engineering which ensures discipline and good conduct among all the Staff members and Students associated with the institute.

We have set up Grievance Redressal Committee (GRC) which shall actively engage to bring justice to the students in every aspect. Any injustice to the students shall be redressed effectively and we promise there shall be no miscarriage of justice towards any student. Our students are the architects of this great nation. We strive very hard in our every attempt to nurture them with all our indomitable love care and affection.

### 6.1 Code of conduct for students:

- Students should follow the rules and regulations prescribed by the institute.
- Students should wear their Identity Cards while in the college premises.
- Students should be punctual for lectures and maintain discipline and decorum in the institute.
- Students are prohibited from usage of mobile phones inside the library and during lecture hours.
- Students should not loiter around the college corridors during lecture hours.
- Students are advised to handle the lab equipment and institute facilities carefully, cost for any damage from their side must be borne by them.
- As per the Institute rules, students should have minimum 75% attendance to be eligible for appearing for the examinations.
- Students should not remain absent without prior permission. In case of medical reasons, they should submit medical certificates immediately after they join back to the institute.
- Ragging and any sort of harassments are strictly prohibited on the campus.
- Students should not involve in any kind of illegal activities.
- Students should follow environment friendly practices and be ethically and socially responsible citizens.
- Any type of gender or socio-economic discrimination amongst students will be a punishable offense.
- Any grievances or complaints should be immediately communicated to the concerned Department Heads or the disciplinary committee members.

### 6.2 Code of Conduct for Faculty & Staff

- Faculty and staff should wear their Identity Cards while in the college premises.
- Faculty and staff members should maintain highest level of professional behaviour standards.
- Teachers should discharge his/her duties assigned to them sincerely and honestly.
- Faculty members should be available for guidance to the students and encourage them to actively participate in extra-curricular and co- curricular activities.
- Faculty members should not show partiality or discrimination among students based on their gender or socio-economic status.

- Faculty members should not involve in any sort of harassments to the students or other staff members.
- Faculty members should inculcate ethical behaviour and discipline among students.
- Faculty and Staff members should refrain from any sort of illegal or questionable activities.
- All the faculty and staff members should work responsibly towards the betterment of the institute.
- Faculty members and staff members should take prior permission for availing leaves.

### **6.3 Code of Conduct for Administration**

- The institute shall create an environment of participative management.
- Institute shall provide freedom of expression of views for faculty, staff and students and maintain transparency in the system.
- Faculty shall have autonomy in executing their tasks and responsibilities.
- There shall be no discrimination among staff members or students based on their gender or socio-economic status.
- The institute shall not harass any employees and shall not involve in unethical practices.
- Any grievances of the faculty or staff members must be redressed by the Head of the Departments or Principal. Student grievances shall be redressed by the redressal committee of the institute.

When you abide by the code of conduct in letter and spirit you find yourself the happiest, the most successful and most respectable human being. Let us give it a beginning from this moment to build a great India.

## Annexure I

### Guidelines for preparation of ESE Question Paper (SE, TE, BE)

#### 1. End Semester Question Paper (QP) Setting Guidelines:

- Similarity between Two sets of QPs may be up to **50%** only.
- QP has total **Six** questions with equal 20 marks.
- Question No. 1 is **Compulsory** with six sub questions, covering all six COs. Each sub question carries 5 marks each, i.e., a total of 30 marks has to be assigned for Question No. 1 out of which Students has to solve only four sub questions ( $4 \times 5 = 20$  Marks).
- Question No.s 2 to 6 are of 20 marks each with two sub questions each carrying 10 marks. Students have to solve any Three out of Five Questions ( $3 \times 20 = 60$  Marks).
- Marks assigned to a Module/Chapter should be as per the weightage in teaching hours mentioned in the syllabus. For e.g., here 39 hours are considered as 40. QP comprises of 6 questions carrying 20 marks each i.e., a total of 120 Marks. Hence Q.1(A)  $120/40 = 3$  Marks per Hour. Example calculation are as follows:

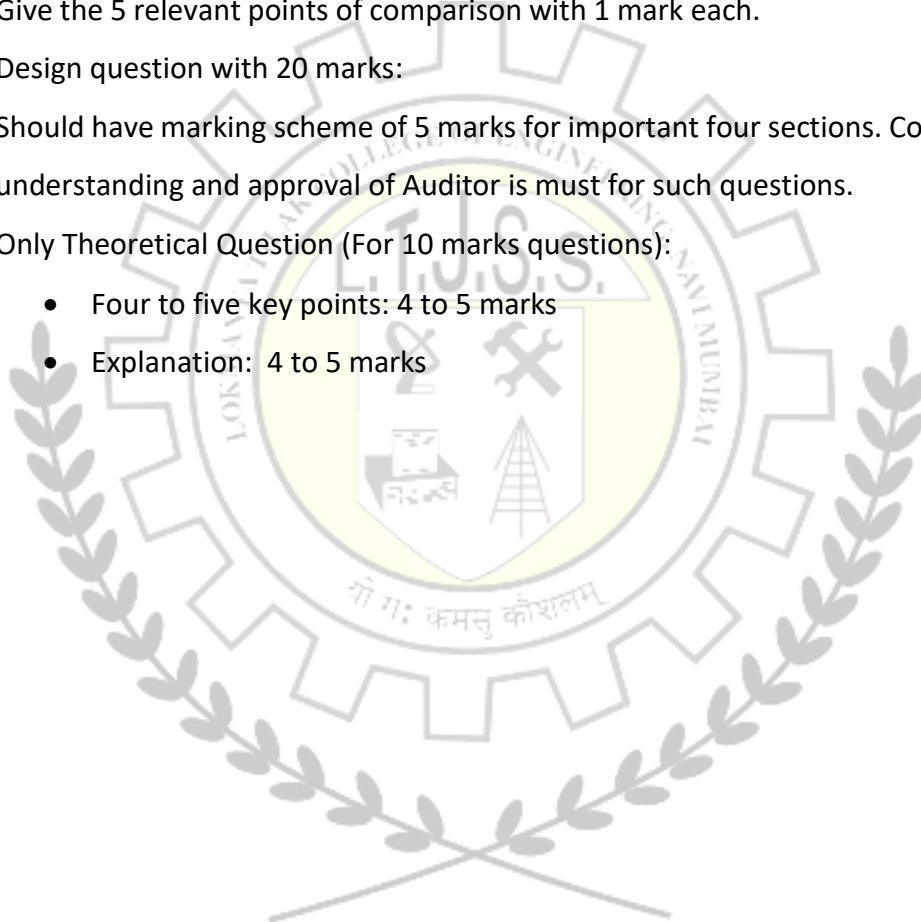
Module	COs	Hours	3 marks per Hour	Marks per Module	Rounded Marks	Finally Assigned Marks
1	CO 1	8	$8 \times 3$	24	25	25
2	CO 2	6	$6 \times 3$	18	20	25
3	CO 3	9	$9 \times 3$	27	30	25
4	CO 4	6	$7 \times 3$	21	20	25
5	CO 5	6	$6 \times 3$	18	20	15
6	CO 6	4	$4 \times 3$	12	10	15
		39 $\approx$ 40			120	130

- Minimum Marks assigned to any Module/Chapter is to be equal to 10.
- Maximum Marks assigned to any Module/Chapter should not exceed 30.
- In the above example, 4 chapters are assigned with 25 marks and 2 chapters with 15 marks. Hence for each chapter 5 marks question can be asked in Question 1 and remaining questions with 10 marks can be asked from Q2 to Q6.
- Q2 to Q6 each having 20 marks can be set with combinations of various Modules/Chapters.
  - Example:* Module 1 and Module 4 with 10 marks each can be asked as Q2 (a) and (b). So that maximum COs will be attempted by the students.
- Do not ask any question with both sub questions on same Module/Chapter, it may leave out two to three COs not attempted by the students.

#### 2. Answer Key or Marking Scheme Guidelines:

- Marking Scheme (For 10 Marks questions):
  - Diagram/Circuit/Illustration/waveform: 4 marks
  - Explanation: 3 marks

- Advantages and Disadvantages (relevant points only): 1 to 2 Marks
  - Application: 1 to 2 marks
- b. For Numerical Questions (For 10 Marks questions):
- Complete Solution needed
- Formula: 2 marks
  - Stepwise: 6 marks
  - Correct Answer: 2 marks
- c. Comparison (For 05 Marks questions):
- Give the 5 relevant points of comparison with 1 mark each.
- d. Design question with 20 marks:
- Should have marking scheme of 5 marks for important four sections. Complete understanding and approval of Auditor is must for such questions.
- e. Only Theoretical Question (For 10 marks questions):
- Four to five key points: 4 to 5 marks
  - Explanation: 4 to 5 marks



### 3. Auditor Remarks on QP.



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 Sector-04, Koparkhairane, Navi Mumbai - 400 709



#### End Semester Examination Question Paper Auditor Report (May /June 2025)

<b>Branch:</b>	<b>Semester:</b>
<b>Course Code &amp; Name:</b>	<b>QP Code:</b>
<b>Max. Marks:</b>	<b>Duration:</b>

Sr. No.	Compliance	Remarks		
1.	Check whether the marks assigned to each module are not less than 10 and not more than 30.	QP Set 1	QP Set 2	QP Set 3
	Module 1			
	Module 2			
	Module 3			
	Module 4			
	Module 5			
	Module 6			
2.	Are all COs covered in QP?			
3.	Are BT levels assigned as per the given guidelines?			
4.	Is the data given correctly without any ambiguity?			
5.	Are the diagrams clear?			
6.	Is the font readable (Times New Roman, Font Size: 12)?			
7.	Whether Q. No. 1 has 6 sub-questions?			
8.	Whether Q. No. 2 to 6 are for 20 marks and are combinations of various Modules?			
9.	Are all three QP sets different? Whether the repetition of questions across the three sets is kept within the limit of 30%?			
10.	Whether the special question with 20 marks has proper justification?			
11.	Any special comment by the Auditor			

**QP Setter Name and Signature**

**Auditor Name and Signature**

#### 4. Appointment of Examiners/QP Setters

### CONFIDENTIAL

(LETTER OF APPOINTMENT FOR PAPER SETTER)

Letter No.: LTCE/EXAM/2025/0156

To,

Sr. No.	NAME	ADDRESS	ROLE	E- MAIL ID CONTACT NO.
1			Convener	
2			Paper Setter	
3			Paper Setter	

Dear Sir / Madam,

We are pleased to inform you that the Examination Cell of LTCE, An Autonomous Institute affiliated to the University of Mumbai, has appointed you jointly as **Convener and Question Paper Setter**, as mentioned in the below table.

You are requested to coordinate with your team members and submit **3 sets** of Question Papers along with answer keys as per the given formats to the Exam Cell.

Programme	
Name of the Examination & Scheme	FH 2025 – Summer Session 2025 (R19)
Year & Semester	BE Sem. VII
Course Name & Course Code	
Duration of Exam	03 Hrs.
Maximum Marks of Exam	80
No. of Set Required	03

## CONSENT FORM

### Acceptance of Appointment and Declaration

I \_\_\_\_\_ accept an appointment as a paper setter for the course \_\_\_\_\_ of FE / SE / TE / BE of branch Computer / CSE-AIML / CSE-DS / CSE-IOT / Electrical / Electronics and Telecommunication / Mechanical of Semester \_\_\_\_\_ during the End Semester Examination of First Half of 2025.

I confirm that neither my **son/daughter** nor any **close relative** is enrolled in the said course or appearing for the specified examination.

Date:

Signature of Examiner

## Annexure II

### Sample ESE Question Paper for Examiners

**Subject: DVLSI (ECC503)**

**Class and Semester: TE, V**

Q. No.	Question	Module	COs	BL	Marks
<b>Q1</b>	a) Explain significance of clock generation in VLSI design.	5	1	2	5
	b) For enhancement type NMOS transistor threshold voltage $V_T=0.6V$ , $V_{GS} = 3.3V$ , $V_{DS}= 2$ , solve and find transistor is operating in saturation or Linear region.	2	2	3	5
	c) Illustrate 2:1 mux using TG and explain	3	3	3	5
	d) Describe 1T DRAM Cell.	4	4	2	5
	e) Demonstrate layout of Inverter using lambda based design rules	1	5	3	5
	f) Explain HLSM	6	6	1	5
<b>Q2</b>	a) Explain 1T DRAM with its read and write operation, also draw the layout.	4	4	2	10
	b) Explain nMOS fabrication process with neat and clean diagrams	1	1	1	10
<b>Q3</b>	a) Illustrate the following 1) SR latch using CMOS 2) DFF using TG	3	2		10
	b) Draw and explain CMOS inverter with transfer characteristic. Find the condition for symmetric inverter.	2	2	2	10
<b>Q4</b>	a) Design and explain 1) 8-bit carry select adder 2) 4-bit array multiplier	5	5	6	10
	b) Using the RTL design process 1) Design Datapath of Parallel FIR filter 2) Design HLSM for Soda dispenser machine	6	6	6	10
<b>Q5</b>	a) Illustrate the expression 1-bit full adder using the following logic style. 1. Pseudo NMOS and 2. Dynamic Logic	3	3	3	10
	b) Design the 2 input NAND and NOR gate using CMOS logic. Find equivalent CMOS inverter for simultaneously switching of all input	2	2	6	10
<b>Q6</b>	a) Compare the effect of Full scaling and Constant voltage scaling on Current, Power, power density. State which is more power efficient	1	1	5	10
	b) Design 4 *4 bit NOR and NAND based array to store the following data Memory address : 1000, 0100, 0010, 0001 Data : 1100 , 1001, 0110, 1011	4	5	6	10

Module	COs	Rounded Marks as per hours	Actual Marks Assigned in QP
1	CO1	25	25
2	CO2	20	25
3	CO3	30	25
4	CO4	20	25
5	CO5	20	15
6	CO6	10	15
<b>Total</b>		<b>120</b>	<b>130= 120 +10 (2 options in Q. No. 1)</b>

# Sample ESE Question Paper for Students



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Sector-04, Koparkhairane, Navi Mumbai - 400 709



## End Semester Examination (May /June 2025)

Branch:  
Course Code & Name:  
Max. Marks: 80

Semester:  
QP Code:  
Duration:

Note:

1. Question No. 1 is compulsory.
2. Attempt any three questions out of the remaining five questions.
3. Assume suitable data wherever necessary.
4. Figures to the right indicate full marks.

Q.1	Answer the following (Any four)	Marks
a.		05
b.		05
c.		05
d.		05
e.		05
f.		05
Q.2	a.	10
	b.	10
Q.3	a.	10
	b.	10
Q.4	a.	10
	b.	10
Q.5	a.	10
	b.	10
Q.6	a.	10
	b.	10



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**End Semester Examination (May /June 2025)**

<b>Branch:</b>	<b>Semester:</b>
<b>Course Code &amp; Name:</b>	<b>QP Code:</b>
<b>Max. Marks: 40</b>	<b>Duration:</b>

**Note:**

1. Question No. 1 is compulsory.
2. Attempt any THREE questions out of the remaining FIVE questions.
3. Assume suitable data wherever necessary.
4. Figures to the right indicate full marks.

Q.1	Answer the following (Any Five)	Marks
	a.	02
	b.	02
	c.	02
	d.	02
	e.	02
	f.	02
Q.2	a.	05
	b.	05
Q.3	a.	05
	b.	05
Q.4	a.	05
	b.	05
Q.5	a.	05
	b.	05
Q.6	a.	05
	b.	05

## Annexure III

### Student Feedback (On Teaching Learning)

Select only one grade (out of A/B/C/D) against each option for each subject.

(A): Excellent (B): Good (C): Satisfactory (D): Unsatisfactory

Sr. No.	Name of Subjects	Sub-1	Sub-2	Sub-3	Sub-4	Sub-5
<b>Name of the Teacher who taught</b>						
1	Clarity and Audibility of speech in the classroom					
2	Interaction with the students					
3	Effective use of ICT Tools					
4	Course outcomes and Program outcomes are explained properly.					
5	Preparedness and efforts taken to deliver the lecture					
6	Effective utilization of the lecture time and uniform coverage of syllabus.					
7	Use of student centric methods for enhancing learning experiences.					
8	Timely conduction and evaluation of internal exams/Quiz					
9	Well organized lecture/learning material provided by the teacher					
10	Discussion on topics beyond syllabus					
11	Any other comments /Suggestions:					

### **Students Feedback (On Facilities)**

Write only one grade (out of A/B/C/D) against each option for each subject.

**(A) - Excellent (B) - Good (C) - Satisfactory (D) Unsatisfactory**

Sr. No.	Parameters
1	Classrooms are spacious and well equipped with projector facility
2	Laboratories are well equipped
3	Library has sufficient resources for learning and reference
4	Internet facility
5	Training & Placement facility
6	Facilities available for sports/games and other extracurricular activities
7	Canteen facility
8	Drinking water facility
9	Washroom facility
10	Overall campus environment is conducive for learning