

R.26 Credit System and Mode of evaluation for Trimester Pattern

For Integrated M. Tech. in Chemical Engineering offered by Institute of Chemical Technology (ICT) at Bhubaneswar and Marathwada, Jalna Campus

1. Introduction

Integrated M. Tech. course after 12th Standard (HSSC) of 5 year duration consisting of 15 trimesters with alternate term in industry, with major in Chemical Engineering and minor in 6 different disciplines has been started to ensure improved quality and industry relevance in curricula in the field of Chemical Engineering as major branch with minor in Petrochemicals, Textiles, Polymers and Materials, Foods and Pharmaceuticals, and Energy Engineering, Food Engineering (in Marathwada, Jalna). The salient features are:

1. Four-month Trimester pattern with studies and In-plant training (IPT) alternate term.
2. Simultaneous 2 years' experience in various Industries.
3. Award of B. Tech. in Chemical Engineering as well as M. Tech. in Chemical Engineering. Both these degrees to be given after successful completion of 5 years.
4. Student is continuously monitored and participates in classroom discussions, home assignments, and research projects.

This concept/curriculum of Integrated M. Tech. is new and being introduced in India for the first time.

2. Course Structure

The course has a trimester-based structure. Each quarter consisting of 4 months, approximately 12 weeks of teaching. The schedule of trimesters is as follows:

Year	Trimester	Scheme of trimesters	Starting Month
1	T1	Theory	September
1	T2	Theory	January
1	T3	In-plant	May
2	T4	Theory	September
2	T5	In-plant	January
2	T6	Theory	May
3	T7	In-plant	September
3	T8	Theory	January
3	T9	In-plant	May

4	T10	Theory	September
4	T11	In-plant	January
4	T12	Theory	May
5	T13	In-plant	September
5	T14	Theory	January
5	T15	Theory	May

During the Term T3, students will be asked to choose their Minor. Students will be allotted different branches based on their choices and Merit Rank based on their CGPA after T2. Maximum number of students allotted to any branch would not be more than 11 (eleven). This would ensure that all the branches get equal number of students. Once a particular Minor is allotted, students will not be allowed to change their Minor.

There are mainly two types of courses in the Institute: lecture courses and laboratory courses. Lecture courses consist of lecture (L) and tutorial (T) hours. Laboratory courses consist of practical (P) hours. The credit (C) for a course is dependent on the number of hours of instruction per week in that course, as given below:

- (1) 1h/week of lecture (L) or tutorial (T) = 1 credit
- (2) 2h/week of Practicals (P) = 1 credit
- (3) Credit (C) for a theory course = No. of hours of lectures per week + No. of hours of tutorials per week = L + T
- (4) Credits (C) for a laboratory course = $0.5 \times$ No. of hours of laboratory course per week

Credits will be assigned to in-plant, Seminar, Projects and other mandatory course requirements also and these will be mentioned in the syllabi.

3. Evaluation

3.1 The marks allotted for evaluation to all subjects would be 100. The weightage to different modes of assessments shall be as under.

	In-term Evaluation		End Term Exam	Components of continuous mode
	Continuous Assessment	Mid Term-Exam		
Theory	50	-	50	Quizzes, class tests (open or closed book), home assignments, group assignments, <i>viva-voce</i> assignments, discussions
Practicals	50	-	50	Attendance, <i>viva -voce</i> , journal, assignments, project, experiments, tests

3.2. In-Term Evaluation:

- It is expected that the teacher would conduct at least three assessments of equal weightage and approximately equally spaced throughout the term under the continuous mode.
- The teacher will announce at the beginning of the respective course the method of conducting the tests under the continuous mode and the assignment of marks
- In-term performance of all students should be displayed and sent to the academic office by the teacher at least 5 days before the end-term examination.
- The in-term, continuous assessment evaluation shall be shown to the student from time to time throughout the term, as and when the evaluations are conducted by the subject teacher.
- The cumulative marks for all in-term evaluation would be 50.

3.3. End-Term examination:

- The Term end examination will cover the full syllabus of the course and will be conducted as per the Institutional timetable at the end of each term.
- End term examination for all subjects will be for 50 marks and 2 h duration.
- The end term examination answer books shall be graded by the subject teacher within a period of 7 days from the date of examination.
- The subject teacher shall conduct an “open house session” with the candidates registered for the course, wherein, the registered candidates can see the assessment of their answer books by the subject teacher. After conducting such a session and making changes in the marks, if any, the subject teacher shall send the marks to the Academic Office.
- No revaluation of these examinations will be allowed.

3.4 Evaluation in Laboratory Courses

The evaluation of Laboratory courses would be done in the following manner:

Continuous Assessment		End Term Examination	
Parameter	Marks	Parameter	Marks
Completion of all experiments (based on grades in the laboratory log book)	25	Satisfactory Performance of Experiment(s)	10
Submission of fair Journal	15		
Quality of Flow Diagram Results, Graphs, Comments	15	Quality of Flow Diagram Results, Graphs, Comments	10
Viva(s)	15	Viva	10

3.5 Evaluation of the In-Plant Training

At the end of every in-plant training term, students will have to submit:

- (i) a written report of the work carried out, and
- (ii) an evaluation of the student from the Industry Mentor.
- (iii) After coming back to the Institute, the student would have to present the work carried out to a committee of two faculty members of the Institute. The presentation would be evaluated by the committee and student will be given a grade for the in-Plant training based on the following parameters

3.5.1 Format for Evaluation by Industry Mentor

Name of the Student: _____

Name and Designation of the Mentor: _____

Name and Address of Organization / Place of Internship: _____

Email: _____ Phone: _____

Internship Duration: Start Date: _____, End Date: _____

Instructions to the Mentor:

Please evaluate the student on following Parameters & tick appropriate column:

Excellent: > 80%, Good: 60 – 80%, Satisfactory: 40 – 60%, Needs Improvement: < 40%

	Needs Improvement	Satisfactory	Good	Excellent

General Behaviour: Ethics and Attendance				
Oral and Written Communication Skills				
Interpersonal Skills				
Technical Knowledge				
Professional Skills: Initiative and Motivation				
Managerial Skills: Time and Resource				

Any Other Remarks: _____

Signature of the Mentor: _____

3.5.2 Format for Evaluation by Faculty Members of the Institute and assigning grade

Name of the student: _____

	Item	Marks
Report/IPT Dairy	Background of Project/Industry	/05
	Technical work done/Industry study Any of the followings i. Experiment performed ii. Mathematical modelling if any iii. Design iv. Techno-economic feasibility v. Analysis of data vi. Process study and observations	/30
	Conclusions	/10
	Writing skills including formatting as per given instructions	/05

Presentation	i. Presentation based on the work performed and its analysis. ii. Presentation skill	/20
Industry Mentor	Marks given by industry mentor	/30
Total		/100

3.6 Pass and Fail

- (a) The candidates who obtain 40% and more marks of the total marks of a subject head shall be deemed to have **passed** the respective subject head.
- (b) The candidates who obtain marks less than 40% of the total marks of a subject head shall be deemed to have **failed** in the respective subject head (**Grade FF**).

3.7 Grades

- (a) The performance of a student shall be documented by a **Letter grade**. Each letter grade has a **Grade point** associated with it. The Grades and Grade points shall be assigned to each head of passing and both will be indicated in the mark-list of the term examination.
- (b) The total marks (in-term+end-term) of a candidate in a subject head are converted into a letter grade, based on the relative (and sometimes the absolute) performance of the student.

Letter Grade	Grade Point
AA	10.0
AB	9.0
BB	8.0
BC	7.0
CC	6.5
CD	6.0
DD	5.5
EE	5.0

- (c) For granting class and calculating percentage marks secured by the candidate, CGPA will be multiplied by 10.
If CGPA is greater than 7.0, candidate would be assigned First Class with Distinction. If $6.0 \leq \text{CGPA} \leq 6.99$ candidate would be assigned First class.
If $5.0 \leq \text{CGPA} \leq 5.99$ candidate would be assigned Second class.

- (d) The grades to be allotted in the case of students who fail or do not appear at the end-term examination shall be as under.

Letter Grade	Grade Point	Explanation
FF	0	The candidate fails in subject head. The candidate will be allowed to take end-term repeat or subsequent examinations as per rules.
XX		The candidate has not kept term for the subject head due to attendance less than requisite. Further see 3.5(g) below. In the above cases, the candidate has to repeat the respective course by paying the fees.
I	0	The candidate has kept term for the subject head, has taken all the internal examinations with satisfactory performance, but has failed to take the end-term examination or repeat examination due to genuine reasons. The candidate will be allowed to take end-term repeat or subsequent examinations as per rules.
FR	0	The candidate has exhausted all the permissible chances to clear the end-term examinations. The candidate has to register for the respective term again for all the subject heads or will be out of the respective degree course as per the rules.
DR	0	(i) The candidate hasn't participated in academic programme. (ii) The candidate has taken a drop for the subject head;
		- provided he/she intimates the same (i or ii) at least 7 days in advance of the commencement of the end-term examination for the respective year.

- (e) Grades **FF** and **I** are place-holders only and do not enter into CPI/SPI calculations directly. These grades get converted to one of the regular grades after the subsequent examinations.
- (f) A candidate with an **FR** grade is not eligible for any repeat examination in that course and has to re-register for that term by paying the appropriate fees.

- (g) **I** grade will not be continued beyond the permissible number of end-term/repeat examinations. In the six consecutive exams conducted by the institute, irrespective of whether the candidate fails to take any of these exams.
- (h) **'XX' Grade:** The grade **XX** in a course is awarded if – (i) candidate does not maintain the minimum 75% attendance in the Lecture/Tutorial/Practical classes, (ii) candidate receives less than 40% of the marks assigned for continuous assessment (iii) candidate indulges in a misconduct/uses unfair means in the examination, assignments, etc., of a nature serious enough to invite disciplinary action in the opinion of the teacher.
(Note: Award of the **XX** grade in the case of i(iii) above shall be done by Disciplinary Action Committee (DAC)).
- (i) The names/roll numbers of students to be awarded the **XX** grade should be communicated by the teacher to the Academic office as per academic calendar before the last date of submission of the application for end-term examination.

3.8. Awarding the grades

The grading scale ranks the students on a statistical basis on the basis of the overall performance of the students of a given class in the given subject head. Therefore, statistical data on students' performance is a prerequisite for applying the grading system. While assigning grades in a given subject head, it is essential to know the **average marks (AM)** obtained by the students *who have passed the subject head* and the **highest marks (HM)** obtained in the *same subject head*.

3.8.1. If the **average marks (AM)** obtained by the students *who have passed the subject head* is $<60\%$, the interval AM shall be awarded grade CC and the other grades shall be decided as follows:

- i. AA, AB, BB, and BC grades shall be decided between the AM and HM by dividing the range in equal intervals.
- ii. CD, DD and EE grades shall be decided between the AM and minimum marks required for passing the head (i.e. 40%) by dividing the range in equal intervals.

3.8.2. If the **average marks (AM)** obtained by the students *who have passed the subject head* is such that $60\% \leq AM < 70\%$, the interval AM shall be awarded grade BC and the other grades shall be decided as follows:

- i. AA, AB, BB grades shall be decided between the AM and HM by dividing the range in equal intervals.
- ii. CC, CD, DD and EE grades shall be decided between the AM and minimum marks required for passing the head (i.e. 40%) by dividing the range in equal intervals.

3.8.3. If the **average marks (AM)** obtained by the students *who have passed the subject head* is such that $70\% \leq AM < 80\%$, the interval AM shall be awarded grade BB and the other grades shall be decided as follows:

- i. AA and AB grades shall be decided between the AM and HM by dividing the range in equal intervals.
- ii. BC, CC, CD, DD and EE grades shall be decided between the AM and minimum marks required for passing the head (i.e. 40%) by dividing the range in equal intervals.

3.8.4. If the **average marks (AM)** obtained by the students *who have passed the subject head* is such that $80\% \leq AM < 90\%$, the interval AM shall be awarded grade AB and the other grades shall be decided as follows:

- i. AA grades shall be decided between the AM and HM by dividing the range in equal intervals.
- ii. BB, BC CC, CD, DD and EE grades shall be decided between the AM and minimum marks required for passing the head (i.e. 40%) by dividing the range in equal intervals.

3.8.5. If the **average marks (AM)** obtained by the students *who have passed the subject head* is such that $AM \geq 90\%$, the interval AM shall be awarded grade AA and the other grades shall be decided as follows:

- i. AB, BB, BC CC, CD, DD and EE grades shall be decided between the AM and minimum marks required for passing the head (i.e. 40%) by dividing the range in equal intervals.

3.8.6. Absolute Grading: Absolute grading is to be awarded for subjects under the following cases:

- i. Subject in which candidate works under the supervision of a guide on a project involving work in individual capacity or working in a small group. The subjects where such work is involved are, for example, Seminar, Home Paper, Literature Review, Critical Review, Research Project, In-Plant Training, Summer Project, etc. Grades are awarded directly on the basis of marks secured by the student in such a subject head, as per the following table.
- ii. Subject in which the registered candidates are less than 10 in number. In such cases, calculation of Average Marks (AM) intervals and intervals for awarding grades higher than AM and lower than AM becomes statistically inaccurate. In such cases, grades are awarded directly on the basis of marks secured by the student in such a subject head, as per the following table.

	Letter Grade	Grade Points
Marks secured $\geq 80\%$	AA	10
$75\% \leq$ Marks secured $< 80\%$	AB	9
$70\% \leq$ Marks secured $< 75\%$	BB	8
$65\% \leq$ Marks secured $< 70\%$	BC	7
$60\% \leq$ Marks secured $< 65\%$	CC	6.5
$55\% \leq$ Marks secured $< 60\%$	CD	6
$50\% \leq$ Marks secured $< 55\%$	DD	5.5
$40\% \leq$ Marks secured $< 50\%$	EE	5
Marks secured $< 40\%$	FF	0

4. TPI and CPI

- (a) **Term Performance Index (TPI):** The performance of a student in a term is indicated by **Term Performance Index (TPI)**, which is a weighted average of the grade points obtained in all the courses taken by the student in the term and scaled to a maximum of 10. (TPI is to be calculated up to two decimal places.)

A Term Grade Point Average (TGPA) will be computed for each term as follows:

$$TGPA = \frac{\sum c_i g_i}{\sum c_i}$$

Where

' c_i ' is the number of credits allotted to a particular subject, and

' g_i ' is the grade-points awarded to the student for the subject based on his performance as per the above table. TGPA will be rounded off to the second place of decimal and recorded as such.

- (b) **Cumulative Performance Index (CPI):** An up-to-date assessment of the overall performance of a student from the time he entered the Institute is obtained by calculating the **Cumulative Performance Index (CPI)** of a student. The CPI is a weighted average of the grade points obtained in all the courses registered by the student since he entered the Institute. CPI is also calculated at the end of every term (up to two decimal places).

Starting from the first term at the end of each term (T), a Cumulative Grade Point Average (CGPA) will be computed. CGPA will be rounded off to the second place of decimal and recorded as such.

- (c) The CGPA, TGPA and the grades obtained in all the subjects in a term will be communicated to every student at the end of every term/beginning of the next term.
- (d) When a student gets the grade 'FF', or 'I' in any subject head during a term, the SGPA and CGPA from that term onwards will be tentatively calculated, taking only 'zero' grade point for each such 'FF' or 'I' grade. When the 'FF' grade(s) has/have been substituted by better grades after the repeat examination or subsequent term examination, the TGPA and CGPA will be recomputed and recorded.

5. Repeat End-Term Examination

- 5.1. For those candidates who fail in a subject head or are eligible for appearing at the repeat examination, **Repeat End-Term Examination** will be conducted, as per **Regulation R.14**, as per schedule given below. The repeat examinations for a particular trimester will be conducted in the gap between the subsequent trimesters as per the schedule shown in the table below:

Year	Trimester	Trimester Type	Repeat Exam of
1	T1	Theory	
1	T2	Theory	
			T1
1	T3	Inplant	
			T2
2	T4	Theory	
2	T5	Inplant	
			T4
2	T6	Theory	
3	T7	Inplant	
			T5
3	T8	Theory	
3	T9	Inplant	
			T8
4	T10	Theory	
4	T11	Inplant	
			T10
4	T12	Theory	
5	T13	Inplant	
			T12
5	T14	Theory	
5	T15	Theory	Repeat of T14, T15

5.2. The marks obtained by candidates in the in-term examinations (continuous assessment) will be carried forward in such cases.

5.3. Grading the performance in the Repeat Examination: The grades will be assigned as per 3.5 and 3.6 above. However, for a candidate taking any repeat examination or subsequent regular term examination shall be awarded **one grade lower** than that decided on the basis of the actual marks obtained; provided 'EE' grade obtained in such an examination shall remain 'EE'. For reference see the table below.

Grade obtained in repeat or subsequent end term examination	Grade to be assigned	Grade point
AA	AB	9.0
AB	BB	8.0
BB	BC	7.0
BC	CC	6.5
CC	CD	6.0
CD	DD	5.5
DD	EE	5.0
EE	EE	5.0

5.4 Repeat Practical Examination

Repeat examination in practical subject is permitted only under following cases: (i) Candidate has obtained 50% marks in Continuous assessment and appeared for the regular end semester practical examination and failed, (ii) Candidate has obtained 50% marks in Continuous assessment and could not appear for the regular end semester practical examination due to valid medical reason or family bereavement.

6. Passing of a Term examination

A candidate shall be declared as **'PASSED'** any term examination if he/she has

- a. Cleared all heads of passing by securing grades EE or higher in all the heads;
- b. Passed all the heads of passing such as project, seminar, training, etc. as per the rules;
- a. Satisfactorily completed all the mandatory requirements of the course;
- c. Paid all the Institute dues;
- d. No case of indiscipline pending against him/her.

7. Eligibility for the Award of a Degree

A candidate shall be declared eligible for the award of a degree, if he/she has cleared all the trimester examinations as given in (6) above.

8. Allowed to keep terms (ATKT)

8.1 A candidate who has I grade in one or more heads of passing of a trimester of an academic year shall be allowed to keep terms as per Table below.

8.2. A candidate shall be allowed to keep terms for the subsequent academic Terms if he/she has FF or I grades in not more than two heads of passing from all the heads of passing of the two terms of

the previous academic term taken together as per the Table below. Such a candidate shall be declared as **FAILED, ATKT**.

8.3. Candidates will be allowed to register for subsequent trimesters only if he has cleared previous trimesters indicated in the Table below:

Year	Trimester	Trimester Type	Students allowed to register for a particular term only if
1	T1	Theory	
1	T2	Theory	
1	T3	In-plant	
2	T4	Theory	
2	T5	In-plant	
2	T6	Theory	
3	T7	In-plant	Trimesters: T1-T3 are clear
3	T8	Theory	
3	T9	In-plant	
4	T10	Theory	Trimesters: T1-T6 clear
4	T11	In-plant	
4	T12	Theory	
5	T13	In-plant	Trimesters: T1-T9 are clear
5	T14	Theory	
5	T15	Theory	

9. Repeating a course

9.1 A student is required to repeat the course of a subject head under the following situations:

- A student who gets an **XX, FR, or DR** grade in a course; or
- A student has exhausted all permissible chances to clear the subject head.

9.2 A candidate who remains absent for the in term and end-term examination of a term and the corresponding repeat examination for **ALL SUBJECTS** shall have to take fresh admission for the corresponding term; unless the candidate has dropped out / terminated from the course.

10. Improvement of performance

A candidate will be allowed to appear at the **entire End Term examination** after the regular end term examination as per the respective rules to improve the performance. In such a case if the result of the examination repeated:

1. Is better than the previous one, the previous result shall be declared null and void; and
2. Is worse than the previous one, the result of the subsequent examination shall not be declared.

11. Exemption of subjects

A candidate who had to repeat a year due to year drop may request exemption from re-appearing for the exam in the subjects in which the marks obtained by the candidate were greater than 50%.

12. Exit rules for poorly performing students

A candidate shall be excluded from a course under the following conditions:

- (a) If he/she fails to pass any term examination of any year of the course in not more than four consecutive attempts (Examination conducted by Institute) from the date of joining the course.
- (b) If he/she does not keep two consecutive terms/terms without giving any reasonable justification (as prescribed by the institute) for doing so.
- (c) If a candidate fails to fulfil all the requirements of his/her respective degree within the prescribed period from the date of taking admission to the course, the candidate shall be excluded from the course.