B. Tech. IV: SEM- VIII

Subject Name: In-Plant training **Subject Code: BTCH16802**

Type of course: Professional core course

Prerequisite: Chemical Engineering courses (Basic science, Engineering Science and core courses), Effective Technical Communication and Design Engineering

Rationale: To enhance employability skills of the students In-Plant Training is required. It provides practical experience in a field of Chemical Engineering and helps to reinforce theoretical knowledge gained in different courses to solve real life challenges. The students are given exposure to explore the new developments and techniques, which can lead them to self- employment or even employment generation through extension of the work done in training.

Teaching Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	200
0	0	20	10	-	-	-	160	40	

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Final semester of Chemical Engineering is dedicated to In-Plant Training for at least 12 weeks.

During the 8th semester of Chemical Engineering, every student of chemical engineering branch will have to undergo in-plant training. The in-plant training would be of 10 credits. The in-plant training would be assigned to the students with the approval of the head, chemical engineering department. The total duration of the in-plant training would be for a period equal to the 12 calendar weeks/90 working days. The duration will be divided into 2 phases of equal duration (6 weeks / phase). A student can complete the entire 12 weeks/ 90 days duration in a single organization or can take in two different organizations for each of the phases.

The in-plant training could be of the following forms:

1. In-plant training in a company (Within state or out state) involved in R&D / Process design / manufacturing (QA / QC / Plant engineering / Production / Consultancy / Technical services / Engineering Projects)
2. At the end of 1st phase and 2nd Phase of in-plant training, each student needs to submit a written report based on the work carried out during in-plant training with a weekly diary. The report and weekly diary will be countersigned by the supervisor / in charge of the company.
3. During the 1st& 2nd phase of in-plant training, faculty from the institute need to visit the specific organization / industry to have the update regarding the progress of the student from the industry representative as well as to have interaction with the industry representative.
4. The performance of the student will be assessed based on the written report, weekly diary & a presentation to the committee consisting of two expert faculty members assigned from the University.
5. Generalized points need to be taken care by the students during the report preparation of in-plant training are:

- Company Profile, List of Raw Materials/Products, etc. of the industry & production capacity
- P & I Diagram, Process Flow Diagram Chemical Reactions involved, Unit Operation & Processes Involved Energy & Material Balance Calculations Process & Mechanical design of at least one major and one minor equipment (Reactor / Storage Tank / Heat Exchanging Devices / Distillation Column / Absorber / stripper / Cooling Tower, etc.)
- Treatment & handling of various waste materials which may include liquid effluent handling, air pollution control measures and solid waste handling and disposal.
- Safety measures of the plant site: Process safety, PPEs, color coding & Symbols, types of permits and Fire Extinguishers

6. Students will be assigned a grade based on the written report, weekly diary & a presentation evaluated by the committee of the expert faculty members.

Guidelines for In-Plant Training

1. It shall be of minimum duration of 12 weeks/ minimum 90 days.
2. A student may submit a brief proposal about the work to be carried out in the in plant training, to a committee formed by the head of department within 3 weeks, after starting the in plant training.
3. The in plant training shall be full time for the whole duration.
4. A detailed daily diary is supposed to be maintained by students. It shall be signed duly by the concerned supervisor of industry. It shall be submitted to the department.
5. A comprehensive report is required to be prepared and submitted to the department at the end of the semester. A certificate shall be attached with this report duly signed by the competent authority of the industry for the successful completion of the in plant training. An attendance report shall also be attached with this report.
6. The internal evaluation shall be done at the start of the semester, at the mid the semester and at the end of the semester. The internal marks shall be divided as decided by the head.
7. An attendance report shall be sent to the department after every four weeks
8. A plan for the whole internship duration shall be prepared after joining the industry after consultation with the supervisor/mentor/guide of industry. It shall contain the activities/visits to different sections etc with appropriate timelines.
9. The project report shall be submitted to the institute which may include the objective of training, about the industry, process, product line, equipment/machineries involved, divisions/sections in the industry, any competitor, scope of some improvement in the process/product/efficiency, benefit by the training etc.
10. The industry supervisor may be invited at the time of external examination of the in plant training, if possible. It can be an online presence.
11. The evaluation by an external examiner shall be made considering all guidelines.

Suggested Specification Table with Marks :

%Distribution of Marks for Evaluation					
R Level	**U Level**	**A Level**	**N Level**	**E Level**	**C Level**
5	10	30	30	15	10

Legends: R: Remembrance; U: Understanding; A: Application; N: Analyze; E: Evaluate; C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Demonstrate a sound technical knowledge of their field of training.	20
CO-2	Undertake problem identification, formulation and solution.	20
CO-3	Design engineering solutions to complex problems in Chemical process utilising a systems approach and teamwork.	30
CO-4	Communicate with engineers and the community at large in written and oral forms.	20
CO-5	Demonstrate the knowledge and understanding of Chemical engineering and management principles and their applications.	10

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO-1	2	2	2	2	2	2	2	3	3	3	3	3	3	2	3
CO-2	2	3	2	2	3	2	2	3	3	2	3	3	3	2	3
CO-3	3	3	2	2	2	3	3	3	3	3	3	3	3	3	3
CO-4	3	3	3	2	3	3	3	3	3	3	3	3	3	3	3
CO-5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Rationale*	13	14	9	9	11	13	13	15	15	10	15	15	15	13	14

Rationale*: Explaining why it is matching this particular program outcome

List of Open learning website: **NPTEL lectures. Simulation software learning version is available online.**