

1. SALIENT FEATURES OF THE DIPLOMA PROGRAMME IN CHEMICAL ENGINEERING

1. Name of the Programme : Diploma programme in Chemical Engineering
2. Duration of the Programme : Three years
3. Entry Qualifications : Matriculation or as prescribed by State Board of Technical Education, Haryana
4. Intake : 60 (or as prescribed by the Board)
- 5) Pattern of the Programme : Semester Pattern
- 6) Ratio between theory and Practice : 50 : 50 (Approx.)

7) **Industrial Training:**

Four weeks of industrial training is included after IV semester during summer vacation. Internal assessment out of 50 marks and external assessment out of another 50 marks will be added in 5th semester. Total marks allotted to industrial training will be 100.

Distribution of Marks:

- Daily diary and reports of training - 50 Marks
- Viva Voce (External) - 50 Marks

8) **Ecology and Environment :**

As per Govt. of India directives, a subject on Environmental Education has been incorporated in the scheme.

9) **Entrepreneurship Development:**

A subject on Entrepreneurship Development and Management has been incorporated in the scheme.

10) **Student Centred Activities:**

A provision of 5-6 hrs per week in each semester has been made for organizing Student Centred Activities for overall personality development of students. Such activities will comprise of co-curricular activities such as expert lectures, games, hobby classes like photography, painting, singing etc. seminars, declamation contests, educational field visits, NCC, NSS and cultural activities etc.

2. EMPLOYMENT OPPORTUNITIES

Employment opportunities for diploma holders in Chemical Engineering are visualized in following industries at various levels/positions:

- i) Chemical and Allied Industries like
 - (a) Fertilizer industry
 - (b) Petroleum refinery and petrochemical industry
 - (c) Oil and natural gas corporation
 - (d) Steel plant
 - (e) Cement plant
 - (f) Cosmetic industry
 - (g) Sugar industry
 - (h) Mineral industry
 - (i) Pulp and Paper industry
 - (j) Food Processing industry
 - (k) Consumer goods industry etc.
 - (l) Polymer industry
 - (m) Food industry
 - (n) Agro industry
 - (o) Leather industry
 - (p) Pharmaceutical industry
 - (q) Distilleries
 - (r) Paint and dye industry
 - (s) Rubber industry
 - (t) Soap & detergent industry
 - (u) Textile industry etc.
 - (v) Pesticide industry
 - (w) General processing industries
 - (x) Glass industry
 - (y) Ceramics industry
 - (z) Automobile industry (paint shop and electroplating shop)

In various functional areas like erection and commissioning of plant, plant operation, production, maintenance and safety, quality control, inspection and testing, marketing and sales, consultancy services and areas concerning environmental protection.

- (ii) Research Organizations like CSIR laboratories, Defence laboratories, Atomic energy establishments etc.
- (iii) Boards and Corporations.
- (iv) Entrepreneurs to small/tiny units especially food, agro and chemical industries.
- v) Academic Institutions (as technicians/instructors at all levels)

3. COMPETENCY PROFILE

Keeping in view the employment opportunities of diploma holders in Chemical Engineering, the course is aimed at developing following knowledge and skills in the students:

1. Basic understanding of concepts and principles related to applied sciences and basics of Engineering as a foundation for further studies.
2. Development of communication and interpersonal skills for effective functioning in the world of work.
3. Understanding of basic concepts and principles of electrical and electronics engineering so as to enable the students to apply the knowledge of these principles to the field of chemical handling units.
4. Ability to read and interpret drawings related to plant layout, process equipment and components.
5. Knowledge of various materials used in chemical processes, their properties and specifications.
6. Knowledge and associated skills of various unit operations, unit processes and process instrumentation in process industry.
7. Ability to calculate the quantity of raw materials, energy inputs, manpower requirement and output from the process.
8. Ability to control the process and quality of the products commensurating with laid specifications.
9. Understanding of basic principles of managing men, material and machines/ equipment for optimum production.
10. Appreciation of the need of clean environment and its deterioration by various emissions from industry and preventive procedures and knowledge of safety regulations in process industry.
11. Development of generic skills of thinking and problem-solving, communication, attitudes and value system for effective functioning in a process industry.
12. Proficiency in the use of computers.
13. Basic manual and machining skills as an aid to function effectively in the process industry.
14. Knowledge of testing and quality control activities.
15. Detailed knowledge of petroleum and petroleum products along with processes involved in their production.
16. Detailed knowledge of paints, polymers and technology involved in their production
17. Detailed knowledge of alternate sources of energy
18. Development of good personality in order to have effective communication and business ethics.

4. DERIVING CURRICULUM AREAS FROM COMPETENCY PROFILE

The following curriculum areas have been derived from course objectives.

Sr. No.	Competency	Curriculum Areas/Subjects
1.	Basic understanding of concepts and principles related to applied sciences and basics of Engineering as a foundation for further studies.	<ul style="list-style-type: none"> • Applied Physics • Applied Chemistry • Applied Mechanics • Applied Mathematics
2.	Development of communication and interpersonal skills for effective functioning in the world of work.	<ul style="list-style-type: none"> • Communication Skills
3.	Understanding of basic concepts and principles of electrical and electronics engineering so as to enable the students to apply the knowledge of these principles to the field of chemical engineering.	<ul style="list-style-type: none"> • Basics of Electrical and Electronics Engineering • Applied Mechanics
4.	Ability to read and interpret drawings related to plant layout, process equipment and components.	<ul style="list-style-type: none"> • Engineering Drawing
5.	Knowledge of various materials used in chemical processes, their properties and specifications.	<ul style="list-style-type: none"> • Chemical Technology • Engineering Materials • Applied Chemistry
6.	Knowledge and associated skills of various unit operations, unit processes and process instrumentation in process industry.	<ul style="list-style-type: none"> • Fluid Flow • Heat Transfer • Mechanical Operations • Mass Transfer • Process Instrumentation and Control • Chemical Engineering Thermodynamics • Process Plant Utilities • Chemical Reaction Engineering
7.	Ability to calculate the quantity of raw materials, energy inputs, manpower requirement and output from the process.	<ul style="list-style-type: none"> • Chemical Process Calculations

8.	Ability to control the process and quality of the products commensurating with laid specifications.	<ul style="list-style-type: none"> • Chemical Technology • Process Instrumentation and Control • Engineering Materials • Chemical Engineering Thermodynamics • Chemical Reaction Engineering • Energy Technology • Polymer Technology • Paint Technology
9.	Understanding of basic principles of managing men, material and machines/equipment for optimum production.	<ul style="list-style-type: none"> • Entrepreneurship Development and Management
10.	Appreciation of the need of clean environment and its deterioration by various emissions from industry and preventive procedures and knowledge of safety regulations in process industry.	<ul style="list-style-type: none"> • Pollution Control in Chemical Process Industries • Environmental Education
11.	Development of generic skills of thinking and problem-solving, communication, attitudes and value system for effective functioning in a process industry.	<ul style="list-style-type: none"> • Industrial Visits • Employability Skills • Project Work
12.	Proficiency in the use of computers.	<ul style="list-style-type: none"> • Computer Applications in Chemical Engineering • Basics of Information Technology
13.	Basic manual and machining skills as an aid to function effectively in the process industry.	<ul style="list-style-type: none"> • General Workshop Practice
14.	Knowledge of testing and quality control activities.	<ul style="list-style-type: none"> • Chemical Technology
15.	Detailed knowledge of petroleum and petroleum products along with processes involved in their production.	<ul style="list-style-type: none"> • Petroleum and Petrochemicals Technology
16.	Detailed knowledge of paints, polymers and technology involved in their production	<ul style="list-style-type: none"> • Paint Technology • Polymer Technology
17.	Detailed knowledge of alternate sources of energy	<ul style="list-style-type: none"> • Energy Technology
18.	Development of good personality in order to have effective communication and business ethics.	<ul style="list-style-type: none"> • Employability Skills • Student Centred Activities

5. ABSTRACT OF CURRICULUM AREAS/SUBJECTS

a) Basic Sciences and Humanities

1. Communication Skills
2. Basics of Information Technology
3. Management and Entrepreneurship Development
4. Employability Skills
5. Environmental Education

b) Applied Sciences

6. Applied Mathematics
7. Applied Physics
8. Applied Chemistry

c) Basic Courses in Engineering/Technology

9. Engineering Drawing
10. General Workshop Practice
11. Basics of Electrical and Electronics Engineering
12. Applied Mechanics

d) Applied Courses in Engineering/Technology

13. Introduction to Engineering Materials
14. Fluid Flow
15. Mechanical Operations
16. Chemical Process Calculations
17. Heat Transfer
18. Mass Transfer
19. Chemical Engineering Thermodynamics
20. Chemical Technology
21. Process Instrumentation and Control
22. Computer Applications in Chemical Engineering
23. Chemical Reaction Engineering
24. Process Plant Utilities
25. Pollution Control in Chemical Process Industry
26. Plant Safety
27. Minor Project
28. Major Project

e) Specialised Courses in Engineering/Technology

29. Energy Technology
30. Polymer Technology
31. Petroleum and Petrochemical Technology
32. Paint Technology

