

1. SALIENT FEATURES OF DIPLOMA PROGRAMME IN CIVIL ENGINEERING (SPL. HIGHWAY ENGINEERING)

- 1) Name of the Programme : Diploma Programme in Civil Engineering (Spl. Highway Engineering)
- 2) Duration of the Programme : Three years (Six Semesters)
- 3) Entry Qualification : Matriculation or equivalent as prescribed by State Board of Technical Education, Haryana
- 4) Intake : 40/60 (or as prescribed by the Board)
- 5) Pattern of the Programme : Semester Pattern
- 6) Ratio between theory and Practice : 50 : 50 (approx.)

7) Ecology and Environment:

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

8) Student Centred Activities:

A provision of 5-6 hrs per week has been made for organizing Student Centred Activities for overall personality development of students. Such activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.

2. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN CIVIL ENGINEERING (SPL. HIGHWAY ENGINEERING)

Keeping in view, the present scenario of activities in the field of civil engineering (Spl. Highway Engineering), following employment opportunities are visualized for diploma holders in civil engineering (Spl. Highway Engineering):

- a) Wage Employment in:
 - i) Public sector /private construction companies/Boards/ Corporation/Departments
 - ii) Service sector i.e. Estate Offices of Business organizations/ Universities/Colleges, Hotels, Hospitals etc. specially for repair and maintenance of buildings and their upkeep.
 - iii) Military Engineering Services/BRO/Defence/Railways/ Power Projects/Banks/Municipal Corporations and Committees/Panchayati Raj etc.
 - iv) Installation of communication towers and framed structure.
 - v) Testing laboratories
 - vi) Technical institutions.
- b) Self employment opportunities:
 - i) Small building contractors/Licensed contractors (Class C)
 - ii) Approved building planner and valuer
 - iii) Plumbing and water supply installation and sanitation contracts
 - iv) White washing, distempering, repair and maintenance of buildings, renovations, POP work, texture work, false ceiling, specialized flooring etc.
 - v) Anti - termite treatment
 - vi) Erection job
 - vii) Construction material suppliers/marketing
 - viii) Preparation of computer aided design and drafting
 - ix) Estimating and costing jobs/bill maker
 - x) Surveyor/loss assessment/valuation of buildings etc
 - xi) Water proofing of existing and new building
 - xii) A small enterprise like precast elements/hume pipes/water proofing chemicals , RCC pipes, Hollow blocks, Paver blocks, Prefabricated construction materials etc.
 - xiii) Rain water harvesting system

3. COMPETENCY PROFILE OF DIPLOMA HOLDERS IN CIVIL ENGINEERING (SPL. HIGHWAY ENGINEERING)

Keeping in view, the employment scenario following are the competency profile of diploma holders in civil engineering (Spl. Highway Engineering):

1. Ability to prepare read and interpret civil engineering drawings like that of: buildings; RCC, steel and timber structures; water supply and sanitary installations; roads, bridges and culverts, hydraulic structures etc and their layout.
2. Knowledge of various types of construction materials (including new materials), their properties, suitability and uses, availability and cost.
3. Ability to test various construction materials (Laboratory test & field testing) for their quality and suitability as per BIS code of practice.
4. Knowledge and skills are pertaining to principles and methods of surveying like levelling, plane tabling, theodolite surveying, and tachometry and contouring; modern surveying techniques like total station, remote sensing and GIS.
5. Understanding basic concepts and principles of hydraulics as applied to civil engineering practices.
6. Knowledge of various construction techniques and equipments from substructure to superstructure and finishing operations in respect of;
 - Earth work and foundation
 - Brick masonry
 - Stone masonry
 - RCC structure
 - Pre-fabrication construction elements
 - Hollow blocks
 - Steel and timber structures
 - Joinery and finishing
 - Anti termite treatment
 - Prestressing techniques
 - Installation of public health fittings
7. Knowledge of various BIS Codes and Standards related to civil engineering in the related subjects/areas.
8. Knowledge of concrete technology i.e. importance of mix design, admixtures, types of concretes, concrete operations and associated skills.
9. Knowledge and associated skills pertaining to temporary structures including shuttering and centering
10. Basic knowledge of various types of soils, their behaviour and suitability as construction and foundation material; type of foundations and their construction.

11. Knowledge and skills related to water supply, sewerage and sanitary systems
12. Basic Knowledge of various components and constructional aspects pertaining to:
 - Railways, bridges/culverts and tunnels
 - Highways and airports
 - Irrigation and drainage structures, etc.
 - Railway over bridges and railway underbridges
 - Earth Retaining Wall
13. Ability to design simple structural elements of RCC, steel and masonry with a view to develop appreciation of structural behaviour and safety during earthquakes including other natural disasters.
14. Ability to prepare material estimates as per CSR, costing, valuation and tender documents as per given drawings.
15. Knowledge of various types of common defects in buildings and their rectification.
16. Knowledge of basic principles of management, construction management techniques and accounts
17. Awareness regarding ecology and environmental considerations for executing construction activities/projects
18. Knowledge of:
 - Safety measures and regulations
 - Building bye laws
 - Labour management
 - Importance of interpersonal relations and communication skills
 - Report writing skills
 - Value system
 - Generic skills of problem solving
 - Employability Skills
19. Knowledge of basic components of Traffic Engineering
20. Understanding the characteristics of an entrepreneur and entrepreneurial support system.
21. Ability to make use of computer softwares for different applications in the field of highway engineering
22. Knowledge of applied and engineering sciences to facilitate understanding of technical subjects, to develop analytical skills, and to facilitate continuing education of diploma engineers

Note: This competency profile will form the basis for identification of subjects and limit the boundaries of knowledge and skills for working out curriculum details

4 DERIVING CURRICULUM AREAS FROM COMPETENCY PROFILE

Sr.	Competency Profile	Curriculum Areas
1.	Ability to prepare, read and interpret civil engineering drawings like that of buildings; RCC, steel and timber structures; water supply and sanitary installations; roads, bridges and culverts etc. and their layout	- Engineering Drawing - Civil Engineering Drawings (including CAD) - Surveying - Building Construction
2.	Knowledge of various types of construction materials (including new materials), their properties, suitability and uses, availability and cost	Construction Materials
3.	Ability to test various construction materials for their quality and suitability as per BIS code of practice	Testing of Materials (part of relevant subjects)
4.	Knowledge and skills pertaining to principles and methods of surveying like levelling, plane tabling, theodolite surveying, tachometry and contouring; modern surveying techniques including Total Station, Remote sensing and GIS	- Surveying
5.	Understanding basic concepts and principles of hydraulics as applied to civil engineering practices	Fluid Mechanics
6.	Knowledge of various construction techniques from structure to superstructure and finishing operations in respect of; - Earth work and foundation - Brick masonry - Stone masonry - RCC structure - Steel and timber structures - Joinery and finishing - Anti-termite treatment - Prestressing technique - Installation of public health fittings - Aluminium frames - Interior decoration, - fire fighting	Building Construction
7.	Knowledge of various BIS Codes and Standards related to civil engineering	BIS Codes and Standards (Part of relevant subjects)
8.	Knowledge of concrete technology i.e. mix design, admixtures, types of concretes, concrete operations and associated skills	Concrete Technology
9.	Knowledge and associated skills pertaining to temporary structures including shuttering and centering	Temporary Structures (Part of building construction)
10.	Basic knowledge of various types of soils, their behaviour and suitability as construction and foundation material types of foundation and their construction	Soil and Foundation Engineering
11.	Knowledge and skill related to water supply, sewerage and sanitary systems	Water Supply and Waste Water Engineering

12.	Knowledge of constructional aspects pertaining to highways, railways, irrigation structures, bridges/culverts and tunnels, flyover bridges.	<ul style="list-style-type: none"> - Highway and Airport Engineering - Railways, Bridges and Tunnels - Highway Construction and Maintenance - Irrigation Engineering
13.	Ability to design simple structural elements of RCC, steel, masonry with a view to develop appreciation of structural behaviour and safety during earthquakes including other natural disasters	<ul style="list-style-type: none"> - Applied Mechanics - Structural Mechanics - Elementary Structural Design (RCC, masonry And Steel) - Aspects of Earthquake Resistant Building Construction - Disaster Management
14.	Ability to prepare material estimates as per CSR, costing and tender documents as per given drawings	Quantity Surveying and Valuation
15.	Knowledge of various types of common defects in buildings and their rectification	Repair and Maintenance of Buildings
16.	Knowledge of basic principles of management, construction management techniques and accounts	- Construction Management and Accounts
17.	Awareness regarding ecology and environmental considerations for executing construction activities/projects	Environmental Education
18.	Knowledge of: <ul style="list-style-type: none"> - Quality Assurance - Safety measures and regulations - Building bye laws - Labour management - Importance of interpersonal relations and communication skills - Report writing skills - Generic skills of problem solving 	<ul style="list-style-type: none"> - Construction Management - Communication Skills - Professional Ethics - Generic Skills - Personality Development - Employability Skills
19.	Knowledge of basic components of traffic engineering	Traffic Engineering
20.	Understanding the characteristics of an entrepreneur and entrepreneurial support system	- Entrepreneurial Awareness (through Camp)
21.	Ability to make use of computers for different applications in the field of highway engineering	<ul style="list-style-type: none"> - Basics of I.T. - Computer Applications in Highway Engineering
22.	Knowledge of applied and engineering sciences to facilitate understanding of technical subjects to develop analytical skills, and to facilitate continuing education of diploma engineers	<ul style="list-style-type: none"> - Applied Mathematics - Applied Physics - Applied Chemistry - Applied Mechanics

5. ABSTRACT OF CURRICULUM AREAS

(a) General Studies

1. Communication Skills
2. Basics of Information Technology
3. Entrepreneurial Awareness
4. Environmental Education
5. Personality Development Awareness
6. Employability Skills

(b) Applied Sciences

7. Applied Mathematics
8. Applied Physics
9. Applied Chemistry

(c) Basic Courses in Engineering/Technology

10. Engineering Drawing
11. General Workshop Practice
12. Applied Mechanics
13. Fluid Mechanics

(d) Applied Courses in Engineering/Technology

14. Construction Materials
15. Building Construction
16. Civil Engineering Drawing
17. Concrete Technology
18. Water Supply and Waste Water Engineering
19. Soil and Foundation Engineering
20. Surveying & Survey Camp
21. Structural Mechanics
22. RCC Design
23. Steel Structures Design
24. Structural Drawing
25. Highway Engineering
26. Computer Applications in Highway Engineering
27. Railways, Bridges and Tunnels
28. Traffic Engineering
29. Highway Construction and Maintenance
30. Irrigation Engineering
31. Quantity Surveying and Valuation
32. Earthquake Resistant Building Construction
33. Construction Management and Accounts
34. Major Project Work

6 HORIZONTAL AND VERTICAL ORGANISATION OF THE SUBJECTS

Sr. No.	Subjects	Distribution in Hours in Various Semesters					
		I	II	III	IV	V	VI
1.	Communication Skills	5	5	-	-	-	-
2.	Applied Mathematics	5	5	-	-	-	-
3.	Applied Physics	6	6	-	-	-	-
4.	Applied Chemistry	5	5	-	-	-	-
5.	Engineering Drawing	6	6	-	-	-	-
6.	General Workshop Practice	6	6	-	-	-	-
7.	Basics of Information Technology	4	-	-	-	-	-
8.	Applied Mechanics	-	5	-	-	-	-
9.	Fluid Mechanics	-	-	5	-	-	-
10.	Surveying and Survey Camp	-	-	7	8	-	-
11.	Construction Materials	-	-	6	-	-	-
12.	Building Construction	-	-	7	-	-	-
13.	Civil Engineering Drawing	-	-	4	6	-	-
14.	Concrete Technology	-	-	-	5	-	-
15.	Water Supply and Waste Water Engineering	-	-	-	7	-	-
16.	Soil and Foundation Engineering	-	-	-	-	6	-
17.	Structural Mechanics	-	-	6	-	-	-
18.	RCC Design	-	-	-	5	-	-
19.	Highway Engineering	-	-	-	-	7	-
20.	Computer Applications in Highway Engineering	-	-	-	-	3	-
21.	Railways, Bridges and Tunnels	-	-	-	-	-	5
22.	Irrigation Engineering	-	-	-	4	-	-
23.	Environmental Education	-	-	-	-	3	-
24.	Structural Drawing	-	-	-	-	6	-
25.	Quantity Surveying and Valuation	-	-	-	-	-	5
26.	Steel Structure Design	-	-	-	-	5	-
27.	Earthquake Resistant Building Construction	-	-	-	-	-	3
28.	Construction Management & Accounts	-	-	-	-	-	5
29.	Employability Skills	-	-	-	-	2	2
30.	Traffic Engineering	-	-	-	-	3	-
31.	Highway Construction and Maintenance	-	-	-	-	-	3
32.	Major Project Work	-	-	-	-	-	12
	Student Centred Activities	3	2	5	5	5	5
	Total	40	40	40	40	40	40