Semester – VI

Subject Name: Building Services

Subject Code: 09CI1604

Diploma Branches in which this subject is offered: Civil Engineering

Objective: Objectives of introducing this subject at third year level in the civil engineering branch is to understand and implement different type of building services require in various structures associated with type and its purpose. It equips student to deal with the installation and structural requirement in building such as lift, escalator, fire safety, lighting, Air-conditioning and many other building services.

Credits Earned: 2

Course Outcomes:

On the completion of the course student will be able to:

- Outline building services provisions at construction project.
- Collaborating construction process with the fixture and arrangement required for desire building services.
- Organize building services provisions in mega structure project.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	4	2	00	30	20	25	25	100

Contents:

Unit	Topics	Contact hours	Weight age (%)
1	**Introduction** • Definitions • Objective of using various building services • Categorization of building services and its selection criteria. • Lighting principal and factor affecting. • Arrangement of luminaries, Distribution of illumination, Utilization factors. • Requirement of Ventilation Types –Natural and Mechanical, Factors affecting the design of Ventilation	**12**	**20**
2	**Electrical Services and Layout.** • Electrical installations in building, accessories and wiring in electrical service. • Different Systems of wiring like wooden casing, cleat wiring, CTS, wiring conduit wiring. • Definition, objective and type of insulation. • Layout plan for electrical wiring in civil construction.	**16**	**30**
3	**Mechanical Services in Buildings** • Introduction of mechanical services • Lift • Definition, Types of Lifts, Design considerations, Location, Size. • Type and uses Elevators & Escalators. • Uses of different types of elevators Escalators. • Type and uses of dumbwaiters. • Different types of Conveyors and its uses. • Air Conditioning • Definition, Purpose, Type, Principles, Temperature Control, Air Velocity Control, Humidity Control, Air Distribution system, Cleaners, Filters, Spray washers, Electric preceptors.	**16**	**30**

4	**Fire Protection, Acoustic and Sound Insulations** • Introduction to fire protection. • Causes and effects of fire. • General Requirements of Fire Resisting building as per IS and NBC 2005. • Characteristics of Fire resisting materials. • Briefing Maximum Travel Distance, Fire Fighting Installations for Horizontal Exit, Roof Exit / Fire Lifts, External Stairs • Requirement of good Acoustic and various sound absolvent • Factors to be followed for noise control in residential building.	**12**	**20**

Suggested List of Presentation/Demonstration/Experiments & Calculations:

Sr. No.	Unit No.	Name of Topics	Hours
1.	1.	Introduction to Building services and machineries.	2
2.		Presentation on different type of building service.	2
3.		Demonstrating lightening principal using model.	2
4.		Market survey on mechanical on illumination product.	2
5.		Report writing on illumination product and its installation requirements.	2
6.		Preparing a chart containing types of ventilation and its application.	2
7.	2.	Prepare electrical layout plan for given building.	4
8.		Prepare Lighting plan for a commercial complex.	4
9.		Prepare rain water harvesting layout plan for a building	4
10.		Preparing a chart containing different types of wiring system.	2
11.		Presentation on Insulation system and its application.	2
12.	3.	Prepare Lift standards as per norms	2
13.		Identify proper locations for Lift/ Escalator/ Elevator in a given commercial complex.	4
14.		Preparing chart on different type of escalator and its application.	2
15.		Presentation on dumbwaiters and conveyer	2
16.		Market survey on available air condition system and preparing its report.	4
17.		Presentation on Air condition system	2
18.	4.	Prepare fire safety standards as per NBC 2005	2
19.		Prepare a case study for the fire fighting services for commercial building in the nearby area.	4
20.		Suggest noise control methods for a given commercial complex	2
21.		Prepare a plan for fire safety measures for a given multi story building	4
		Total	**56**

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

a. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory.

b. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

c. Students will use supplementary resources such as online videos, videos, e-courses, Virtual Laboratory.

Reference Books:

No.	TITLE	AUTHOR	PUBLISHER
1	A text book on Building Services	R. Udaykumar	Eswar Press, Chennai
2	Building Services	S. M. Patil	SeemaPublication,Mumbai Revised edition
3	National Building Code of India -2005	Bureau of Indian Standards	BIS, New Delhi
4	Building Construction	Dr. B. C. Punmia	Laxmi Publications (P) Ltd., New Delhi