

B.E. Semester: VII
Department of Civil Engineering

Subject Name: Building Services (CV703-N-B)

Course Category: Program Course Elective – II (PCE)

A. Objectives of the Course:

- Building services are the essential services provided in the buildings for improving functioning of the buildings in efficient manner for the desired use of the building.
- The electrical services, mechanical services such as air conditioning, lighting, ventilation, fire protection, acoustics and sound insulations, elevators, escalators, as well as civil engineering services such as water supply, sanitary services, etc. have become most essential services for residential, industrial, high rise, hotels, motels, monumental buildings.
- The main objective of the course is to teach students about these services.
- No building can be put into effective utilisation without all these services.
- To develop skills in the students to prepare plan for various types of services in the building.

B. Teaching & Evaluation Scheme:

Teaching Scheme				Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		IE	CIA	Pra/Viva	
hrs	hrs	hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
3	0	0	3	3	3	70	30	20	00	120

C. Detailed Syllabus:

1. Introduction to Building Services:

Definitions, Objective and uses of services, Applications of services for different types building considering, Classification of building services, Types of services and selection of services, Natural and artificial lighting- principles and factors, Necessity of Ventilation, Types of ventilation – Natural and Mechanical, Factors to be considered in the design of Ventilation

2. Electrical Services and Layout in Different Types of Building:

Technical terms and symbols for electrical installations and accessories of wiring, Types of insulation, electrical layout for residence, small work shop, show room, school building, etc.

3. Mechanical Services in Buildings:

Introduction of mechanical services

Lift: Definition, Types of Lifts, Design Considerations, Location, Sizes, Component parts

Elevators & Escalators: Different types of elevators and Escalators, Freight elevators, Passenger elevators, Hospital elevators, Uses of different types of elevators Escalators.

Air Conditioning: Definition, Purpose, Principles, Temperature Control, Air Velocity Control, Humidity Control, Air Distribution system, Cleaners, Filters, Spray washers, Electric preceptors, Types of Air Conditioners, (Central type, Window Type, Split Unit

4. Fire Protection:

Introduction, Causes of fire and Effects of fire, General Requirements of Fire Resisting Building as per IS: 1642:1989 and NBC 2005, Characteristics of Fire Resisting Materials , Maximum Travel Distance, Fire Fighting Installations for Horizontal Exit, Roof Exit / Fire Lifts, External Stairs

5. Miscellaneous Services and Green Buildings Provisions:

Plan for Rain Water Harvesting in the New Buildings, Concept of GREEN Buildings, Components of GREEN Building, Components of Grey Water System, Management of Grey Water System and Distribution Pattern, Solar Power System

D. Lesson Planning:

Unit No	Title of the Unit	Minimum Hours	Weightage (%)
1	Introduction to Building Services	8	25
2	Electrical Services and Layout	8	20
3	Mechanical Services in Buildings	12	30

4	Fire Protection	12	15
5	Miscellaneous Services and Green Buildings Provisions	5	10
Total		45	100

E. Assignments:

- Introduction to Building Services
- Electrical Services and Layout
- Mechanical Services in Buildings
- Fire Protection
- Miscellaneous Services and Green Buildings Provisions

F. Instructional Method and Pedagogy (Continuous Internal Assessment Scheme CIA):

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures, practical and Tutorial which carries 05 Marks.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks.
- One internal exam of 30 marks is conducted as a part of Mid Semester evaluation.

G. Students Learning Outcomes:

On the successful completion of this course

- The students will be able to acquire different learning outcomes in managing building services provisions in big construction sites.
- Synchronize the construction activities with installation of building services engineering
- Select the suitable electrical as well mechanical services for particular requirements of buildings.

- Ensure green building applications to the new constructions.

H. Recommended Study Materials:

a. Text book & Reference Books:

1. R. Udaykumar ; A text book on Building Services;Eswar Press, Chennai
2. S. M. Patil ; Building Services ; Seema Publication, Mumbai Revised edition
3. Bureau of Indian Standards; National Building Code of India – 2005;BIS, New Delhi
4. Dr. B. C. Punmia ; Building Construction ; Laxmi Publications (P) Ltd., New Delhi
5. P. C. Varghese ; Building Construction ; PHI Learning (P) Ltd., New Delhi
6. P. S. Gahlot ; Building repair and Maintenance Management ; CBS Publishers & Distribution(P) Ltd

b. Web Materials:

1. www.academia.edu
2. www.nptel.iitm.ac.in
3. "[http://en.wikipedia.org/w/index.php?title=Dumbwaiter_\(elevator\)&oldid=621761813](http://en.wikipedia.org/w/index.php?title=Dumbwaiter_(elevator)&oldid=621761813)"
4. www.bis.org.in/sf/nbc.htm
5. cpwd.gov.in/Units/handbook.pdf
6. <http://www.civilengineeringnews.tk/2014/07/methods-of-demolition-of-building.html>
7. thecontractor.org uilding.html

c. Indian Codes of Practice:

1. IS: 1642:1989, Code of Practice for Fire Safety of Building
2. NBC 2016, National Building Code of India

