



Gyanmanjari
Innovative University

Course Syllabus
Gyanmanjari Institute of Technology
Semester-4 (Diploma)

Subject: Building Services-DETCV14211

Type of course: Minor Stream

Prerequisite: NA

Rationale:

Building services, encompassing electrical, mechanical, and civil engineering systems, are crucial for the efficient functioning of various buildings, including residential, industrial, high-rise, hotels, and monumental structures. These services ensure the intended purpose of buildings and include eco-friendly and sustainable designs, such as green building principles and grey-water management. Civil engineering students must understand the fundamental principles, installation procedures, operation, and maintenance of these building services. However, plumbing and sanitary services are excluded from this curriculum as they are covered separately.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
CI	T	P	C	Theory Marks		Practical Marks		CA	
				ESE	MSE	V	P	ALA	
3	0	2	4	60	30	10	20	30	150

Legends: CI - Class Room Instructions; T - Tutorial; P - Practical; C - Credit; ESE - End Semester Examination; MSE - Mid Semester Examination; V - Viva; CA - Continuous Assessment; ALA - Active Learning Activities.



Course Content:

Sr.No	Course Content	Hrs.	% Weightage
1	Introduction to Building Services Definitions Objective and uses of services Applications of services for different types of building, Classification of building services Types of services and selection of services Natural and artificial lighting: principles and factors Arrangement of luminaries, Distribution of illumination, Utilization factors Necessity of Ventilation Types – Natural and Mechanical Factors to be considered in the design of Ventilation.	7	20
2	Electrical Infrastructure and Design Electrical services in the building: Technical terms and symbols for electrical installations and Accessories of wiring. Systems of wiring like wooden casing, cleat wiring, CTS wiring, conduit wiring. Types of insulation. Electrical layout for residence, small workshop, show room, school building, etc. Smart Home: Uses, Smart Electrical Appliances, Smart Security systems. Rooftop Solar PV Power plant: overview of Solar PV Technology, overview of Rooftop Solar Sector in India, type of Rooftop Solar PV Power Plants and operating principles.	11	25
3	Mechanical Services in Buildings Introduction of mechanical services Lift, Definition, Types of Lifts, Design Considerations, Location, Sizes, Component parts- Lift Well, Travel, Pit, Hoist Way, Machine, Buffer, Door Locks, Suspended Rope, Lift Car, Landing Door, Call Indicators, Call Push, Elevators & Escalators Different types of elevators and Escalators, Freight elevators, Passenger elevators, Hospital elevators, Uses of different types of elevators Escalators. Dumbwaiters Different types of Dumbwaiters Uses of different types of dumbwaiter. Air Conditioning Definition, Purpose, Principles, Temperature Control, Air Velocity Control, Humidity Control, Air Distribution system, Cleaners, Filters, Spray washers, Electric precipitators.	11	25
4	Fire Protection, Acoustic and Sound Insulations Introduction, causes of fire and Effects of fire, General Requirements of Fire Resisting building as per IS and NBC 2005 Characteristics of Fire resisting materials Maximum Travel Distance, Fire Fighting Installations for Horizontal Exit, Roof	9	20



	Exit/ Fire Lifts, External Stairs, Requirement of good Acoustic, Various sound absorbent, Factors to be followed for noise control in residential building. Apply various types of fire services as per requirements of building. Select the suitable type of Fire protection.		
5	Miscellaneous Services & Green Buildings Provision Rain water Harvesting for buildings, Rooftop rainwater harvesting, grey water reuse, Significance of Grey water reuse, Components of Greywater system & its management, Concept of GREEN buildings, Components of GREEN building.	7	10

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	Visit A Construction Site: Visit construction site to observe installation of building services and prepare a report. And upload it on GMIU Web Portal.	10
2	Prepare the Estimated cost of Electrification: The faculty will assign students to prepare the estimated cost for the electrification of the residential building of the site under construction and upload the details in report form on GMIU Web Portal.	10
3	Collect the technical brochures: Collect the technical brochures of various building service components from the local market or the internet, present them in report form, and upload them to the GMIU Web Portal.	10
Total		30

Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage %	20%	50%	10%	20%	-	-



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:

After learning the course, the student should be able to:	
CO1	Manage building services provisions in big construction sites.
CO2	Synchronize the installation of building services as per the sequence of construction activities.
CO3	Select the suitable electrical as well as mechanical services for particular requirements of buildings.
CO4	Ensure Fire Protection, Acoustics and Sound insulation along with green building applications to the new constructions.
CO5	Ensure Green building applications to the new constructions.

List of Practical:-

Sr.No	Descriptions	Unit No	Hrs.
1	Prepare Lighting plan for a commercial complex.	1	02
2	Prepare electrical layout plan for a given building.	2	02
3	Prepare Lift standards as per norms.	3	02
4	Identify proper locations for Lift/ Escalator/ Elevator in a given commercial complex.	3	02
5	Suggest noise control methods for a given commercial complex.	4	02
6	Prepare a case study for the firefighting services for commercial buildings in the nearby area.	4	02
7	Compute space requirement for Rooftop rainwater harvesting system and Prepare rainwater harvesting layout plan for a building.	5	04



8	Prepare a report on implementing the reuse of greywater of an existing hotel building in a nearby area.	5	02
9	Mini Project	-	06
10	Report Writing	-	06

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 blackboard, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

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

The internal evaluation will be done on the basis of Active Learning Assignment.

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

Reference Books:

- [1] The A to Z of Practical Building Construction and its Management Sandeep Mantri Satya Prakashan.
- [2] Plumbing Design and Practice Deolalikar, S.G. McGraw-Hill.
- [3] Fire Services in India: History, Detection, Protection, Management, Environment, Training and Loss Prevention Bag, S.P Mital Publications.
- [4] Principles of Fire Safety Engineering: Understanding Fire and Fire Protection AKHIL KUMAR DAS.

