

Branch Name:	Civil engineering
Program Code:	ET401
Course Name:	Building services
Course Code:	2ET4010507
Pre-requisite Course:	---

COURSE OBJECTIVE:

The content should be taught and implemented with the aim to develop skills so that students are able to acquire following competencies:

1. Manage building services provisions in big construction sites
2. Synchronize the construction activities with installation of building services.
3. Select the suitable electrical as well mechanical services for particular requirements of buildings

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
03	-	02	04	60	40	20	30

DETAILS OF COURSE CONTENTS:

S.NO.	TOPIC	Total Hrs.	WEIGHTAGE
1	Introduction to building services 1.1 Definitions, Objective and uses of services 1.2 Applications of services for different types building considering 1.3 Classification of building services 1.4 Types of services and selection of services 1.5 Natural and artificial lighting principles and factors 1.6 Arrangement of luminaries, Distribution of illumination, Utilization factors 1.7 Necessity of Ventilation Types – Natural and Mechanical Factors to be considered in the design of Ventilation.	08	18%
2	Electrical Services and Layout 2.1 electrical services in the building Technical terms and symbols for electrical installations and Accessories of wiring 2.2 Systems of wiring like wooden casing, cleat wiring, CTS wiring conduit wiring 2.3 Types of insulation	10	24%

	2.4 Electrical layout for residence, small work shop, show room, school building, etc.		
3	Mechanical Services in Buildings 3.1 Introduction of mechanical services 3.2 Lift - (a) 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 - (a) Different types of elevators and Escalators, Freight elevators, Passenger elevators, Hospital elevators, (b) Uses of different types of elevators Escalators. Dumbwaiters (a) Different types of Dumbwaiters (b) Uses of different types of Dumbwaiter. Conveyors - (a) Different types of Conveyors (b) Uses of different types of Conveyors Air Conditioning (a) Definition, Purpose, Principles, Temperature Control, Air Velocity Control, Humidity Control, Air Distribution system, Cleaners, Filters, Spray washers, Electric preceptors, (b) Types of Air Conditioners, (Central type, Window Type, Split Unit)	10	24%
4	Fire Protection, Acoustic and Sound Insulations 4.1 Introduction 4.2 Causes of fire and Effects of fire 4.3 General Requirements of Fire Resisting building as per IS and NBC 2005 4.4 Characteristics of Fire resisting materials 4.5 Maximum Travel Distance 4.5 Fire Fighting Installations for Horizontal Exit, Roof Exit / Fire Lifts, External Stairs 4.6 Requirement of good Acoustic 4.7 Various sound absorbent 4.8 Factors to be followed for noise control in residential building	08	18%
5	Miscellaneous Services 5.1 Rain water Harvesting for buildings 5.2 Introduction and Significance to Grey water 5.3 Components of Grey water system 5.4 Management of Grey water system	06	16%

LIST OF PRACTICAL:

SR. No.	Experiment / Exercises
1	Draw the following Sketches : 1. Prepare electrical layout plan for given building 2. Prepare rain water harvesting layout plan for a building 3. Prepare Lift standards as per norms 4. Suggest noise control methods for a given commercial complex 5. Prepare a plan for fire safety measures for a given multi story building 6. Prepare Lighting plan for a commercial complex 7. Identify proper locations for Lift/ Escalator/ Elevator in a given commercial complex 8. Prepare a grey water management for a residential complex
2	Field Visit and Report : Visit a residential building & commercial building under construction and prepare layout for electrical, water supply, sanitary and related allied services of civil engineering and prepare site visit detailed report

LIST OF REFERENCES:

Sr.no.	Title	Author
1	Building Services	R. Udaykumar Eswar Press, Chennai
2	Building Services	S. M. Patil Seema Publication, 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

LIST OF OPEN SOURCE SOFTWARE/LEARNING WEBSITE:

- 1) www.academia.edu
- 2) www.nptel.iitm.ac.in
- 3) "https://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) <https://www.civilengineeringnews.tk/2014/07/methods-of-demolition-of-building.html>
thecontractor.org

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Understanding of Building Services Systems	2 Understanding
CLO2	Apply engineering principles to design and analyse building services systems	2 Understanding 3 Applying
CLO3	Identify and solve problems related to building services design, installation, and maintenance through critical thinking and application of engineering principles	5 Evaluate, 3 Applying
CLO4	Demonstrate knowledge of relevant building codes, regulations, and standards related to building services	3 Applying, 5 Evaluate
CLO5	Stay informed about emerging technologies and trends in building services engineering	2 Understanding
CLO6	Evaluate and incorporate principles of energy efficiency and sustainability in building	3 Applying, 4 Analyzing 5 Evaluate

Course Learning Outcomes	Program Outcomes(Po's)											
	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12
CLO1	H				L		L					
CLO2	M											
CLO3	H		H		L						M	
CLO4	M		L						M			
CLO5	H						L					
CLO6	M	M	H		M						H	

H: High, M: Medium, L: Low