

B. Tech. Civil Engineering					
Course code: Course Title		Course Structure			Pre-Requisite
CE328: Fire Safety of Structures		L	T	P	Nil
		3	1	0	
Course Objective: The objectives of this course are to expose the students to the concepts of functional design of building for thermal aspects and energy efficiency, especially in tropical climates, i.e., in the Indian context. Further, the objective is to make the student capable of performing fenestration design for natural ventilation and daylighting & design of space for external and internal noise control.					
S. No	Course Outcomes (CO)				
CO1	Comprehensive understanding of fire dynamics, fire resistance, and fire safety systems.				
CO2	Able to design, analyse, and optimize building services for modern, efficient, and intelligent buildings.				
CO3	Comprehensive understanding of water supply, wastewater, drainage, and electrical systems.				
CO4	Enable to plan, execute, and manage maintenance activities effectively to ensure the durability and performance of built structures.				
CO5	Comprehensive understanding of maintenance cycles, decision-making models, and repair techniques.				
S. No	Contents				Contact Hours
UNIT 1	Fire Protection: Process of combustion in fire, Effect of fire load & ventilation condition on enclosure fire, growth and decay of fire in the enclosure. Concepts of fire resistance and severity, Effect of fire on materials. Fire Rating of Structures. Simple Design of elements for the given fire resistance. Planning, Fire detection & suppression systems, Smoke venting				10
UNIT 2	Lifts & Vertical Transportation: arrangement of lifts and Design for optimum service condition. Building Services as a system, Capacity of storage and sizing, control system, etc. & intelligent building. HVAC System: Design Considerations. Basic psychometrics, Air conditioning process & system. Methods of Air Conditioning.				8
UNIT 3	Water Supply, Hydraulic design, Storage, Distribution, Components of cold & hot water supply system. Waste water & Drainage systems: Fixture units & Design of system and elements of electrical services.				8
UNIT 4	Definition, Role of building maintenance in the construction process, Maintenance generators, Expression of Standards, selection of the level of maintenance, and fixing standards. Planned maintenance: Planning vis-a-vis ad hoc maintenance, schedule & contingency maintenance, levels of planning, planned inspection, etc				8

UNIT 5	Maintenance cycle, maintenance profile, repair & replacement models, statistical methods, decision models, optimal renewal cycle, budgeting etc. Effect of design on maintenance, Diagnosis, appraisal, structural defects & various methods of repair	8
	Total	42
REFERENCES		
S. No.	Name of Books/Authors/Publishers	Year of Publication / Reprint
1	Bureau of Indian Standards, "Handbook of Functional Requirements of Buildings, (SP-41 & SP-32)", BIS 1987 and 1989.	1987, 1989
2	Markus, T.A. & Morris, E.N., "Building Climate And Energy", Pitman Publishing Limited. 1980.	1980
3	SP-35 (1987): Handbook of Water Supply & Drainage- BIS, New Delhi.	1987
4	N.B.C.-2007 BIS, New Delhi.	Latest