

MINIMUM CORE SUBJECT AREAS: FIRE ENGINEERING

AREA	SUBJECTS / DESCRIPTION	RECOMMENDED CONTACT HOURS
All areas below are considered core for Fire Engineering with a recommendation of 240 hours total.		
1. Fire Science / Fire Dynamics	<ul style="list-style-type: none"> - Stages of fire development; premixed and diffusion flames; fire plumes; fire properties of materials; ignition; flammability limits; heat of combustion; thermochemistry; spread of flame; smoke production; compartment fire; active protection systems; building fire modeling; use of fire engineer's calculators; modelling of heat release rate, fire plume, ceiling jet; prediction of flashover 	
2. Active Fire Protection System Analysis / Fire Engineering Systems	<ul style="list-style-type: none"> - Basic engineering science of water-based / gas / dry powder fire engineering systems; pedestal fire hydrant system; sprinkler system, water spray / deluge system; drencher system; water mist system; foam system. Gas flooding systems and dry powder system; computer program for system design and hydraulic flow calculation; smoke control systems; fire safety control in HVAC; fire detection and alarm system; fire communication system and false alarm 	
3. Passive Fire Protection System Analysis / Fire Engineering Design of Structures	<ul style="list-style-type: none"> - Fire behavior; fire safety engineering; passive fire control; prescriptive and performance-based design; fire growth rates; temperature prediction in compartment fire; fire severity and fire resistance; material properties at elevated temperatures; behavior of structure in fire conditions; design of steel; concrete and composite structures in fire as per statutory requirements; fire protection and assessment 	
4. Human Psychology & Physiology / Computational Fire Modeling for Building Design	<ul style="list-style-type: none"> - Zone modelling techniques; field modelling techniques; turbulence; velocity-pressure coupling; boundary conditions; wall functions; use of commercial computational fluid dynamics packages; application of fire modelling results: simulation of compartment fire; atrium fire; tunnel fire; sprinkler-plume interaction; evaluation of fire engineering system and assess the impact on people. Building evacuation: time-line approach; pre-movement time; numerical modelling of evacuees' movements and interactions 	
5. Law Regulations and Standards / Legislation Aspects of Fire Safety Management	<ul style="list-style-type: none"> - Fire safety management by legislation: principles and philosophy of fire safety legislation, legal systems; code of practice; fire services installations inspection and testing; fire safety practices; self-regulation; Fire Safety and the community: community fire losses; fire statistics; fire safety provisions and management strategies; public fire safety education; performance-based fire codes 	
6. Fire Risk Management / Design Consideration for Fire Safety Management	<ul style="list-style-type: none"> - Fire safety management by design: rationale of fire safety design; system approach to fire safety design; fire hazard identification; qualitative / quantitative risk analysis and assessment; fire risk ranking; response and performance of fire systems; human responses; fire safety administration in the building industry; principles and techniques of fire safety management; planning for emergencies; fire insurance; fire investigation; security 	