

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"> - fire process , Premised and non-premixed flames ; Fire plumes ; Fire properties of materials ; Ignition ; Spread of flame ; smoke ; compartment fire ; active protection systems ; Building fire modeling ; Use of fire engineer's calculator, e.g. FPETOOL , EGRESS. Zone modelling techniques; modelling of heat release rate, fire plume, ceiling jet: Field modelling techniques: turbulence and turbulent modelling, solution of velocity pressure coupled equations, boundary conditions and wall functions, use of commercial computational fluid dynamics packages 	
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, fixed foam system, dry pipe foam system. Clean agent gas system, CO2 system and dry powder system; Computer program for system design and hydraulic flow calculation; Smoke Control and Staircase Pressurization System; 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, t-square fire curve, temperature prediction of compartment, 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 Hong Kong code, Eurocode, international codes, practical case studies, fire protection, assessment and repair of fire damaged structures 	
4. Human Psychology & Physiology / Computational Fire Modeling for Building Design	<ul style="list-style-type: none"> - 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 	
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; Insurance; Fire Safety and the community: community fire losses, fire statistics, fire safety provisions and management strategies, public fire safety education: Performance based fire codes; Case Studies 	
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, NFPA decision tree, basic science of fire, fire hazard: Risk analysis and assessment: fire risk ranking, risk assessment model, 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; Case studies 	