APPROVED

ENGR: Fire Safety Engineering and Design

Module Details

Module Code:	ENGR
Module Title:	Fire Safety Engineering and Design APPROVED
Title:	Fire Safety Engineering and Design
Module Level::	6
Valid From::	Summer 2022 (January 2022)
Language of Instruction:	English
Credits::	10
Field of Study::	34 - Business & Management
Module Delivered in:	no programmes
Module Coordinator:	Meaney Anne
Module Author::	Meaney Anne
Module Author:	Meaney Anne (25 May 2022 to ---)
Domains:	
Acknowledgment:	A combination of methods including lectures (live, online and pre-recorded), discussions, case studies, readings and self-directed learning will be used. Online classes will be supported by blackboard collaborate.
Module Description:	The aim of this module is to introduce the principles of fire safety design and engineering in buildings.

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
LO1	Understand the principal fire safety objectives in design, explain the principal fire safety design strategies in buildings and summarise the underlying fire engineering principles used in the design requirements.
LO2	Evaluate the differences between and discuss the advantages / disadvantages of prescriptive and performance type regulations. Apply concepts and knowledge to the solution of technical issues related to fire. Outline and explain the fundamental principles of Fire Detection and Alarm Systems and Emergency Lighting.
LO3	Explain the design principles within the Irish Technical Guidance Document, NSAI & BSI Codes of Practice, and other technical standards in demonstrating compliance with regulations
LO4	Understand the application of fire safety engineering (FSE) principles to the design of buildings, the FSE sub-system framework and the use of the qualitative design review (QDR) process for FSE design. Design for fire safety using TGD-B 2006 with regard to: Means of Escape, Fire Spread (Internal & External), Fire fighting access and facilities.
LO5	Understand flashover, its role in enclosure fire severity for a typical fire growth model within a structure, the principles of fire compartmentation and the mechanisms to fire spread beyond the enclosure of fire origin
LO6	Explain the difference between reaction to fire and fire resistance performance and give an outline description of the fire resistance test method.

Dependencies
Module Recommendations
No recommendations listed
Co-requisite Modules
No Co-requisite modules listed
Requirements
No requirements listed
Additional Requisite Information
No Co Requisites listed

Indicative Content
1. Section A – Introduction: 1.1) The design of buildings to fire safety objectives and principles. 1.2) a. A basic knowledge of fire in terms of its science, history, legislation and cost. 1.3) b. Means of escape, Designing the building structure, Access and facilities for fire-fighting, External fire spread, 1.4) c. An understanding of basic human behavior in fire
2. Section B – Design Regulatory System 2.1) Building Regulations and the technical guidance documents, BSI codes of practice and technical standards 2.2) a. Explain science of fire, its history, and how it is legislated for. 2.3) b. Building Control Legislation, Designing for Fire Safety, Means of escape horizontally and vertically, General Provisions for the Means of Escape, The control of fire spread (Internal & External), Fire fighting access & facilities. 2.4) c. Identify and describe basic human behaviors in fire;
3. Section C – Fire Safety Engineering Framework 3.1) FSE sub-system framework and qualitative design review (QDR) 3.2) a. Introduction to Performance Based FSE Design. 3.3) b. Tenability Criteria. 3.4) c. Compartment fire growth and development stages, ignition, pre and post flashover stages, fuel bed and ventilation-controlled fires. 3.5) d. Overview of principles and application of probabilistic risk assessment (PRA) approaches in FSE design.
4. Section D – Fire Compartmentation 4.1) Section D – Fire Compartmentation 4.2) Flashover, principles of compartmentation and fire spread 4.3) a. The control of fire spread (Internal & External) 4.4) b. Firefighting access & facilities

Module Content & Assessment

Assessment Breakdown	%
Continuous Assessment	40.00%
End of Module Formal Examination	60.00%

Special Regulation

Assessments

Part Time

Continuous Assessment

Assessment Type	Essay	**% of Total Mark**	40
Timing	Ongoing	**Learning Outcomes**	1,2,3,4,5,6
Non-marked	No		

Assessment Description
Learners will be required to demonstrate the achievement of the learning outcomes through continuous assessment work. This work may take the form of an essay, exam, project, MCQ test, but is not limited to these formats.

No Project

No Practical

End of Module Formal Examination

Assessment Type	Formal Exam	**% of Total Mark**	60
Timing	End-of-Semester	**Learning Outcomes**	1,2,3,4,5,6
Non-marked	No		

Assessment Description
Examination

Reassessment Requirement

Exam Board
It is at the discretion of the Examination Board as to what the qualifying criteria are.

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

This module has no Full Time workload.

Workload: Part Time

Workload Type	*Workload Category*	*Contact Type*	*Workload Description*	*Learning Outcomes*	*Frequency*	*Average Weekly Learner Workload*	*Hours*
Lecture		Contact	Lectures will cover all learning outcomes	1,2,3,4,5,6	12 Weeks per Stage	6.00	72
Independent Learning Time		Non Contact	Self-Direct Independent Learning - an emphasis on independent learning will develop a strong and autonomous work and learning practices. Review of teaching material, readings, notes.	1,2,3,4,5,6	12 Weeks per Stage	14.83	178
						Total Hours	250
						Total Hours	250.00
						Total Weekly Learner Workload	20.83
						Total Weekly Contact Hours	6.00

Module Resources

Recommended Book Resources

Purkiss, J.A.. Fire Safety Engineering Design of Structures, Butterworth-Heinemann.

Drysdale, D.. An introduction to Fire Dynamics, Wiley.

Buchanan, A. H.. Structural Design of Fire Safety, Wiley.

Garrison, T.. Basic Structures for Engineering and Architects, Blackwell Publishing.

Seward, D.. (2003), Understanding structures, Macmillan Press.

BSI. (2002), Structural Design – Extracts from British Standards for Students of Structural Design, 5th edition, BSI.

Morris, L.J. and Plum,. (1997), Structural Steelwork Design, BS5950, Longman.

O"Brien, E. and Dixon. (1995), Reinforced and Prestressed Concrete Design, LongmanEurocodes 1-5.

[Department of the Environment. Technical Guidance Document B (Fire Safety), Eurocodes EC1-9.

Ashea, K., A. McAneneya and J. Pitman. (2009), Journal of Risk Research, Volume 12, Issue 2 - Total cost of fire in Australia.

DiNenno, P.. (2008), NFPA Handbook on Fire Protection, 4th Ed.. National Fire Protection Association.

Hann, D. and J. David. (2011), Kirk's Fire Investigation, 7th Ed.. Prentice Hall.

Supplementary Book Resources

Transport & Regional Affairs Committee Environment, Michael Wright (Editor). Fire Risk in Houses in Multiple Occupation, Stationery Office Books, p.167, [ISBN: 0117534439].

Recommended Article/Paper Resources

Application of fire safety engineering principles to the design of buildings Part 6: Human Factors: Life Safety strategies - Occupant evacuation, behaviour and conditions.

CIBSE Guide E to fire safety engineering.

(1990), UK Home Office, . Manual of Firemanship Book 1 (Elements of combustion and extinction). : HMSO Books,.

(1998), UK Home Office, . Physics & Chemistry for Firefighters: Fire Service Technology, Equipment & Media. : HMSO Books,.

(1991), Child care act 1991 (early years services) regulations.

(2013), BSI, . PD 7974-7 Probabilistic risk assessment. : BSI,.

(2010), CIBSE, . Guide E Fire Safety Engineering. : CIBSE.

(2010), CIBSE Guide.

(2007), Health Act.

Licensing Acts 1833-1981.

(2011), Multi-Unit Developments Act.

Promoting safe Egress and Evacuation for People with Disabilities.

(1935), Public Dance Halls Act.

Registration of Clubs Acts 1904-1981.

UK Regulatory Reform (Fire Safety) Order Fire Safety Risk Assessment Guidelines.

Supplementary Article/Paper Resources

(2001), BSI, . BS 7974 Applications Fire Safety Engineering to the design of Buildings.BSI,.

(2002), BSI, . PD 7974-0 Guide to Design framework and fire safety engineering procedures. : BSI.

(2003), BSI, . PD 7974-1 Initiation and development of fire within the enclosure of origin (sub-system 1). : BSI,.

Other Resources

http://library.itcarlow.ie/.

http://www.environ.ie.

The Institute of Fire Engineers,
http://www.ife.co.uk

The Institution of Engineers of Ireland,
http://www.IEI.ie

U.S Government Body for Fire Research,
http://www.nist.gov

The Institution of Structural Engineers,
http://www.ise.org.uk

www.info4education.com.

www.environ.ie/en/Publications/Developme ntandHousing/BuildingStandards/FileDownL oad,1640,en.pdf.

Discussion Note:	

Affiliated Entities

Entity Code	Entity Title	Entity Version	Entity Type	Via	Outcome
CW_BSEMS_B	Bachelor of Business (Honours) in Emergency Services Management	1.0	Programme		Yes
CW_BSEMS_C	Higher Certificate in Business in Emergency Services Management	1.0	Programme		Yes
CW_BSEMS_D	Bachelor of Business in Emergency Services Management	1.0	Programme		Yes

statuslog

Initial Status	*End Status*	*Available*	*Date*	*Comment*
Draft	Registrar Approval	Power Clare	01/Jun/2022 11:45	Group Approval
	Draft	Meaney Anne	25/May/2022 15:14	A copy of module 'ENGR - Fire Safety Engineering and Design ' has been created. ID:10390