



CPD course content
available online:
1 Sept – 2 Nov 2020

PRINCIPLES OF FIRE BEHAVIOUR

Online seminar for engineers, built environment and fire safety professionals covering the principles of fire dynamics and fire behaviour.

1 CPD /	R2100
2 CPD /	R4000
CREDITS	FEES

1 DAY “CONCEPTS” OPTION: Provides an understanding of general fire behaviour concepts for built environment practitioners and those involved in fire safety.

2 DAY “DESIGN” OPTION: Additional engineering design information and calculations included, beyond that of the Concepts option.

Online registration link: <https://shortcourses.sun.ac.za/application-form.html?offeringid=052696be-f19b-ea11-9d0d-0050568000ff>





SEMINAR OBJECTIVE

This course covers the principles of fire dynamics as a basis for understanding fire safety. Specific topics covered include:

- Introduction to fire safety and fire behaviour
- Fires science and combustion
- Heat transfer for fires and materials
- Diffusion flames and plumes (free burning)
- Pool fires
- Ignition and the initiation of burning
- Flame spread
- The pre-flashover compartment (fire burning in a room)
- The post-flashover compartment (full room fire)
- An introduction to fire modelling

This online seminar is designed for engineers, built environment practitioners and fire safety practitioners to provide an understanding of fire behaviour and risks.

SEMINAR FOCAL POINTS

The seminar seek to provide an understanding of factors such as:

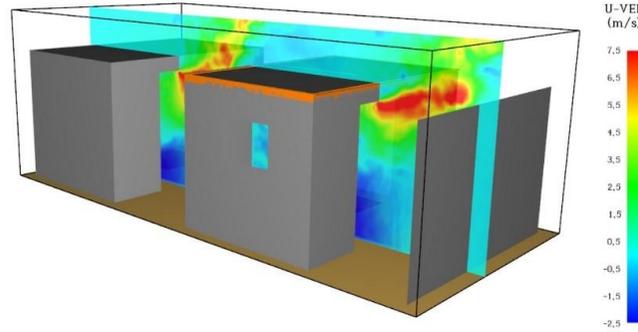
- How do real fires behave?
- What is the difference between a standard fire and a real fire?
- How does burning occur, and what influences it?
- How do fires heat objects up, and how do I know what safe distances or safe wall thicknesses are?
- When will items be ignited?
- Understand concepts such as heat release rates, plumes, combustion and flashover.
- How do fires behave in a room, from ignition all the way to full room involvements?

The online course content is specifically designed such that the “**1 day Concepts Option**” (content equivalent to 1 day of a typical CPD course) is accessible to practitioners from a variety of backgrounds, providing an understanding of fire principles and general aspects. The “**2 day Design Option**” (content equivalent to 2 days of a typical CPD course) includes engineering design calculations and extra content, for describing and analyzing fire behaviour. The “**Postgrad Course Option**” is a full 15 credit postgraduate course requiring additional reading, assignments, tutorial sessions, and an exam. An electronic copy of “An Introduction to Fire Dynamics” by Dougal Drysdale is provided free with the postgrad course option.

ONLINE SEMINAR PROGRAM

	SECTION	TOPICS	FORMAT
A	Introduction to fire safety and fire behaviour	General fire safety concepts and objectives.	<p>This seminar is an online program, with all content being presented through the Stellenbosch University online platform. The lectures, notes, example videos and models pertaining to each section will be posted online.</p> <p>Seminar attendees will be able to access the online material at any time. The system will track what videos and material have been completed for CPD verification purposes.</p> <p>The online material will be available from 1 September until 2 November 2020. At the end of the course, after the closing date, CPD certificates will be issued to everyone who has completed the videos and content in the course.</p> <p>The Concepts Option of the course has been designed to give an understanding of fire dynamic concepts, for people involved in fire safety, such that they can understand why things happen, without necessarily needing to do calculations. The Design Option includes additional calculations and more detailed discussions, and this option which requires an engineering background.</p> <p>The Postgraduate Course Option will also include online assessments, submission of assignments and the completion of an exam. Significant amounts of extra reading is required from the course textbook "An Introduction to Fire Dynamics" by Drysdale.</p>
B	Heat transfer	Conduction, convection and radiation. Steady and non-steady state heat transfer. Configuration factors and radiation at a distance from a burning object. Methods for calculating heat transfer in fires.	
C	Diffusion Flames and Fire Plumes	Flames from natural fires. Buoyant and fire plumes Interaction of plumes with compartments. Practical application of plumes (response of detectors, sprinklers, etc.) Burning of liquids.	
D	Ignition: The Initiation of Flaming Combustion	Ignition of flammable vapours and air mixes. Ignition of liquids Ignition of solids. Spontaneous ignition. Ignition by flame impingement.	
E	Spread of Flame	Flame spread over liquids and solids	
F	The Pre-flashover Compartment	Growth period and flashover. Conditions needed for flashover. Conditions affecting growth and flashover.	
G	The Post-flashover Compartment Fire	Burning regimes. Fully developed fire behaviour. Temperatures in fully developed fires. Fire resistance and fire severity, Flames from compartments. Spread of fires from a compartment.	
?	General queries and comments	An online platform will be provided for asking questions and receiving feedback from the team involved with the course.	

PRESENTERS



1. Prof Richard Walls

Richard Walls (PhD, MSc, GDE, BScEng, BTh, PrEng) is the head of the Fire Engineering Research Unit at Stellenbosch University (FireSUN). He worked as a professional structural engineer designing industrial, petrochemical and commercial buildings before joining Stellenbosch University as a lecturer and researcher.

His areas of research include structural fire design, informal settlement fire safety, timber in fire (CLT), full-scale fire testing, modelling, structural steel and burning things down Myth Buster style (has destroyed more than 70 full-scale homes). He works closely with local fire services developing solutions for informal settlement fire problems, and was involved in an analysis of the homes that burnt down in the 2017 Knysna Fire disaster.

Prof Walls lectures on the design of steel and concrete structures, fire dynamics, structural fire design and supervises various masters and PhD students. He has published journal and conference papers on various topics, and consults to industry on specialist fire engineer projects.

In 2019 the FireSUN team launched masters and PhD degree programs in fire safety engineering.

2. Dr Antonio Cicione

Antonio Cicione (PhD, BEng) is a postdoctoral researcher at Stellenbosch University. He completed his PhD in Fire Safety Engineering at Stellenbosch University and has worked for the University of Edinburgh in the BRE Center of Fire Safety Engineering department, which included large-scale fire tests at the Underwriters Laboratories in Chicago.

Dr Cicione's areas of research include full-scale fire testing (has burnt down more than 70 full-scaled houses for research), numerical modelling (Computational Fluid Dynamics modelling, Zonal modelling and Finite Element modelling), and 3D printed concrete structures in Fire. He has collaborated with some of the world's leading fire experts and has published numerous journal and conference papers on various fire related topics.

Dr Cicione lectures on fire dynamics and he supervises Master's and PhD students.

3. Industry contributions

Short inserts from industry practitioners on practical topics related to fire behaviour will be given, including:

- Design considerations
- Interesting projects
- How fire dynamics influences design
- Activation of sprinklers and detectors
- Smoke extraction
- Fire modelling
- Etc.

CPD CREDITS

The seminar is accredited for 1 or 2 Continued Professional Development credits, for the 1 and 2 day Options respectively, with ECSA.



REGISTRATION

Please register online by clicking on the link below:

1 day "Concepts" Option: <https://shortcourses.sun.ac.za/application-form.html?offeringid=052696be-f19b-ea11-9d0d-0050568000ff>

2 day "Design" Option: <https://shortcourses.sun.ac.za/application-form.html?offeringid=052696be-f19b-ea11-9d0d-0050568000ff>

Please contact civilcourses@sun.ac.za

Our system will generate an email with payment details.



PAYMENT

Normal Bird: R 2100 / R4000

Payment must be received 5 days before the seminar



PAYMENT INSTRUCTIONS

After online registration for a course you will receive an automated email with payment details. Invoices to companies will be created after successful online registration. No online course access will be granted until payment has been received.

PLEASE EMAIL PROOF OF PAYMENT TO: Ms. Tsholofelo Seroalo

Stellenbosch University, Department of Civil Engineering
Email: civilcourses@sun.ac.za
Enquiries: 021 808 2080

EVENT SPONSORSHIP OPPORTUNITIES:

Please contact civilcourses@sun.ac.za for options.