

## Fire Investigation and Failure Analysis (E901313)

Course size (nominal values; actual values may depend on programme)

Credits	9.0	Study time	270 h	Contact hrs	33.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	English	lecture	22.5 h
		seminar	11.25 h

Lecturers in academic year 2018-2019

Hadden, Rory	EDINBU lecturer-in-charge
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Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">International Master of Science in Fire Safety Engineering</a>	9	A

Teaching languages

English

Keywords

fire, forensics, investigation, failure

Position of the course

This is a multidisciplinary course featuring application of previous knowledge and development of new knowledge in an exciting and challenging context. Beyond traditional engineering design, this will test the students in their ability to identify failure of systems, reconstruct scenarios and critically review potential weaknesses in design. This will use Fire Investigation as a focal point of Failure Analysis more generally. Furthermore it will expose students to subjects such as the law and insurance that they will not have dealt with previously but which are important for the practicing engineer.

Contents

1. Introduction to course/outcomes/etc. and introduction to fire investigation
2. Introduction to failure analysis and fault tree analysis
3. The legal system and insurance framework
4. Common building constructions and case study
5. Determining origin and case Study
6. Electrical sources of fire
7. Explosions
8. Evidence and the law (Guest lecture)
9. Analytical methods and fire modelling
10. Fire fighting systems/methods (Guest lecture)
11. Case study/Revision (Guest lecture)

Initial competences

None are assumed.

Final competences

- 1 Apply fundamental knowledge required to investigate fire and explosions: heat transfer, fluid mechanics material response to fire conditions, construction techniques.
- 2 Understand the legislative framework and philosophy of the courts: evidence, insurance, interpretation.
- 3 Awareness of the application of fire science and fire engineering to evaluate the behaviour of materials in fire. Solve inverse problems to reconstruct fire scenarios.
- 4 Achieve an understanding of quantitative tools and their application.
- 5 Appreciate the role of fire fighting systems/methods.

Conditions for credit contract

This course unit cannot be taken via a credit contract

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Lecture, seminar

#### Extra information on the teaching methods

22 hours of lectures; 11 hours of seminars/tutorials; 2 hours of feedback/feedforward; 2 hours of revision sessions; 2 hours of formative assessment; 2 hours of summative assessment; 4 hours of programme level learning and teaching; 135 hours of directed and independent learning

Feedback will be available throughout the course by discussion with tutors and lecture staff.

Discussion will form a key part of the tutorials to reflect this.

Tutorials will also offer a route for formal, formative feedback.

Students will be given the opportunity to provide Stop, Start and Continue feedback and comments on this will be provided back by the course lecturer.

Exam Post-Mortem comments will be provided.

#### Learning materials and price

Drysdale, Introduction to Fire Dynamics

DeHaan, Kirk's Fire Investigation

SFPE, Handbook of Fire Protection Engineering

#### References

#### Course content-related study coaching

#### Evaluation methods

end-of-term evaluation and continuous assessment

#### Examination methods in case of periodic evaluation during the first examination period

Written examination

#### Examination methods in case of periodic evaluation during the second examination period

#### Examination methods in case of permanent evaluation

Oral examination, assignment, report

#### Possibilities of retake in case of permanent evaluation

not applicable

#### Extra information on the examination methods

The assessment will be made on the basis of:

Intermittent Assessment (40%)

- Case study 1 and report (20%)

- Case study 2 and presentation (20%)

Written Examination (60%)

The written examination will be 2 hours long with 3 compulsory questions.

#### Calculation of the examination mark

Written Exam 60 %, Coursework 40 %, Practical Exam 0 %