

*Course syllabus*

# **Kvalificerad brandutredningsmetodik Advanced Fire Investigation**

**VBRN80, 7,5 credits, A (Second Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED BI/RH

**Date of Decision:** 2023-04-12

## **General Information**

**Elective for:** BI4, RH4, BR4

**Language of instruction:** The course will be given in Swedish

## **Aim**

The aim is that the students will be able to, together with an experienced investigator, perform a fire investigation of good quality based on knowledge gained during the education. The students should be able to determine the causes of the fire – both direct and indirect, both technical and human related. They should also be able to explain the spread of fire and smoke based on knowledge from previous courses and, where relevant, show this with the help of calculations and simulations. Students should also be able to identify lessons learned from the fire and describe how these can be translated into actual preventive measures at different levels of society.

Knowledge of real life sources of ignition also aims to improve the students ability to identify risks in the context of inspections and risk analysis.

## **Learning outcomes**

*Knowledge and understanding*

For a passing grade the student must

- be able to explain how causes of fires are determined, both direct and indirect.
- be able to describe the spread of fire and smoke, both qualitatively and quantitatively, based on knowledge from previous courses.
- be able to explain how various factors influence interview responses.

- be able to explain the various factors (psychological and environmental) that influence fire setting behaviour.
- understand how different factors affect the credibility of an interview.
- be able to explain how an evaluation of fire department intervention, with focus on tactics, is performed.

#### *Competences and skills*

For a passing grade the student must

- perform a fire investigation of good quality together with an experienced investigator based on knowledge from the program.
- use established techniques for fire investigation, e.g. patterns.
- determine if risk of ignition exist.
- use knowledge from previous courses to explain spread of fire and smoke, both qualitatively and with the use of calculations and simulations (e.g. CFD).
- use a few established methods for accident investigation.
- identify lessons learned from fires and give suggestions on how they can be implemented in society for improved fire safety.
- perform an interview with high credibility.
- perform a simple evaluation of fire department intervention with a focus on tactics.

#### *Judgement and approach*

For a passing grade the student must

- be able to evaluate the certainty in conclusions of fire investigations.
- understand how uncertainty in conclusions should be handled in different situations.
- understand the possibilities and limitations of using different models (e.g. CFD and 2-zone) and hand calculations as a tool in fire investigations.

## Contents

- Methods for accident investigation and data collection
- Ignition risks – sources of ignition, arson fires and electrical fires
- Application of fire dynamics of actual fires
- Methods for fire investigation
- Interviews
- Use of lessons learned from fires at different levels of society

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** The final certificate is based on (1) a written examination, (2) Project/assignments/labreports. All parts of the examination must be completed for a passing grade. Participation on all seminars, labs, fieldwork are also required. The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

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#### **Parts**

**Code:** 0118. **Name:** Project/Assignment.

**Credits:** 3,5. **Grading scale:** UG. **Assessment:** Passing grade on assignment/project/lab reports

**Code:** 0218. **Name:** Written Examination.

**Credits:** 4. **Grading scale:** TH. **Assessment:** Grade on written exam

# Admission

## Admission requirements:

- VBRF10 Fire Dynamics

**Assumed prior knowledge:** FAFA30 Physics: Electricity-Fluids, VBRF20 Fire Chemistry and Heat Transfer, MMVA01 Thermodynamics and Fluid Mechanics Basic course, VBRN60 Fire Protection Systems, VBRN75 Human Behavior in Fire.

**The number of participants is limited to:** No

## Reading list

- All kurslitteratur görs tillgänglig via Luvit.

## Contact and other information

**Course coordinator:** Marcus Runefors, [marcus.runefors@brand.lth.se](mailto:marcus.runefors@brand.lth.se)

**Further information:** Group assignments and seminars require active participation. Each group member must individually be able to account for the content of the assignment.