



Certificate of Advanced Studies (CAS) / Online course

# Statistics and the Evaluation of Forensic Evidence

## Target audience

Practitioners from any forensic discipline – e.g. reporting officers, chief scientists, lawyers – with a University degree (at least BSc) or an equivalent degree of a higher education programme

## Dates and schedule

The course lasts 18 months with a workload per week of :

- 4 hours on the online platform,
- 3 to 4 hours of personal work.

The course is offered on a yearly basis. See the course website for the latest registration deadlines.

## Certification

- *Certificate of Advanced Studies (CAS)* in Statistics and the Evaluation of Forensic Evidence delivered by the University of Lausanne
- 20 ECTS credits

## Organisation

Faculty of Law, Criminal Sciences and Public Administration, University of Lausanne, Switzerland

## Introduction

This online *Certificate of Advanced Studies (CAS)* is designed to train practitioners in the most up to date approaches to the evaluation and interpretation of scientific evidence. It will provide sound theoretical and practical background in probabilistic and statistical reasoning. A probabilistic framework will be established and its use will be illustrated by an extensive set of realistic case studies.

The course addresses practical issues of interpretation that forensic scientists encounter in their daily activities : interpretation of raw data, sampling issues, communication of findings in both written and oral statements.

## Objectives

- To gain specialized and up-to-date knowledge in the field of forensic interpretation and evaluation of evidence
- To master probabilistic reasoning, Bayesian networks and statistical methods using appropriate tools and software
- To manage issues of interpretation at a high level from case reception to court
- To acquire skills in oral and written communication of uncertainty
- To develop independence and self-confidence in solving practical inferential problems
- To gain a harmonised view with regard to interpretation across forensic disciplines and laboratories, including the establishment of Standard Operating Procedures



## Program

12 months  
(4 hours/week)

### Core modules

#### MODULE 1 : UNCERTAINTY IN FORENSIC SCIENCE

Principles of interpretation / Statistics and the nature of probability / Hierarchy of propositions / Statement writing and fallacies / Bayesian Networks

#### MODULE 2 : ASSESSING EVIDENCE GIVEN SOURCE LEVEL PROPOSITIONS

Assigning a likelihood ratio (LR) / The two trace problem / Statement writing / Standard Operating Procedures / Bayesian networks

#### MODULE 3 : ASSESSING EVIDENCE GIVEN ACTIVITY LEVEL PROPOSITIONS

Estimation of a proportion / Additional factors (transfer, persistence, background) / LR development / Bayesian networks

#### MODULE 4 : ASSESSING EVIDENCE GIVEN OFFENCE LEVEL PROPOSITIONS

Relevance / Multiple offenders / LR development / Bayesian networks

#### MODULE 5 : PRE-ASSESSMENT AND MANAGEMENT OF CASES

Case and evidence pre-assessment / Case strategy / Bayesian networks

### Specialised modules

#### MODULE 6a : DNA EVIDENCE

Population genetics / Paternity / Missing persons / Low template DNA / Mixtures analysis / MtDNA, Chrom-X/Y

#### MODULE 6b : FROM GLASS TO FINGERPRINTS

Fingerprints and face recognition / Footwear marks and tool marks / Handwriting / Sample size determination / Multivariate data analysis / Glass, fibres, drugs, GSR/FDR

### Core module

#### MODULE 7 : EVIDENTIAL MATTERS

Combination of evidence / Database selection / Cross transfer / Courtroom presentation / Laboratory error

6 months  
(4 hours/week)

## Cursus

- 6 core modules
- 2 specialised modules
- Regular on-line evaluation on all modules

Participants will take all core modules and choose one of the two specialised modules.

Core modules cover interdisciplinary interpretation issues that cross forensic disciplines. Specific evidential topics such as DNA, micro-traces, marks and impressions or handwriting will be covered in specialised modules.

## Methodological approach

- Online training will allow the latest knowledge and expertise to be brought directly to your workplace without consideration of distances, travel expenses or time schedules
- Specialists from well-established forensic institutions and participants will study and discuss case scenarios involving scientific evidence
- Theoretical online material will be reinforced by formative and evaluative casework exercises
- Specialised computer programs for evaluation and interpretation will be used (e.g. R, Hugin) and a registered forum will allow the sharing of hypothetical cases
- Videoconferences will be organised to support specific learning tasks
- Participants will also have an opportunity to put together a personal portfolio

# Statistics and the Evaluation of Forensic Evidence

Register at Formation Continue UNIL-EPFL.

[www.formation-continue-unil-epfl.ch/en/statistics-evaluation-forensic-evidence-cas](http://www.formation-continue-unil-epfl.ch/en/statistics-evaluation-forensic-evidence-cas)

## Registration

Fill in the registration form and upload your CV online.

The maximum number of participants is 30. Preference will be given to forensic scientists with casework and reporting experience.

## Contacts

For academic questions:

[sefe@unil.ch](mailto:sefe@unil.ch)

For administrative questions:

Ms. Mary-Claire André Mollet,  
[mary-claire.andremollet@unil.ch](mailto:mary-claire.andremollet@unil.ch)

*«There is a critical need in most fields of forensic science to raise the standards for reporting and testifying about the results of investigations.»*

National Research Council, Strengthening Forensic Science in the United States : A Path Forward. Committee on Identifying the Needs of the Forensic Sciences Community, Committee on Applied and Theoretical Statistics (2009) p. 6-3



## Instructors

- Prof. Franco Taroni, *Forensic statistics*
- Prof. Christophe Champod, *Identification evidence*
- Prof. Alex Biedermann, *Graphical models*
- Dr Tacha Hicks, *Trace evidence*

They will develop and tutor the online course.

Professor Colin Aitken (University of Edinburgh, Scotland) and Dr Ian Evett (United Kingdom) will act as consultants and take an active part in the course.

Romain Voisard (University of Lausanne) will act as pedagogical advisor.

All of them have extensive theoretical and practical experience with evaluation and interpretation from laboratory to courtroom. They have published over the years numerous scholarly papers and textbooks on the subjects of evaluation and statistics in forensic science.



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