KU LEUVEN

Master of Forensic Odontology

Faculty of Medicine

KU Leuven. Inspiring the outstanding.

Forensic odontology

Forensic odontology, also referred to as forensic dentistry, is a discipline of the forensic sciences concerned with the correct examination, evaluation and presentation of dental evidence in criminal or civil legal and deontological proceedings. Forensic odontology relates to the application of dental knowledge in legal proceedings with the intention of contributing to the process of solving crimes or establishing identifications of deceased individuals, whether in mass disasters or individual accidents. Forensic odontologists are also providing expert opinion in cases of dental fraud and litigation.

Discover KU Leuven

Founded in 1425, the University of Leuven (KU Leuven) has been a centre of learning for almost six centuries.

Today, it is Belgium's largest and highest-ranked university as well as one of the oldest and most renowned universities in Europe.

As a leading European research university and co-founder of the League of European Research Universities (LERU), KU Leuven offers a wide variety of programmes in English supported by high-quality, innovative, interdisciplinary research.

Boasting an outstanding central location in the heart of Europe, KU Leuven is home to a vibrant community of international scholars spread out over its various campuses in Flanders and Brussels. 14% of the university's 54,000 students are international, representing 140 countries. KU Leuven's doctoral schools organise internationally oriented PhD programmes for over 4,000 doctoral students.

Leuven is a modern, bustling and safe student city with a long and rich history. Cultural and recreational opportunities abound. KU Leuven's central location offers a truly international experience. Major European capitals such as Brussels, Paris, London and Amsterdam are only a (very) short train ride away.

The programme

As the demand for specialists in forensic sciences and forensic odontology in particular increases, so too does societal awareness of the role forensic odontologists play in solving legal issues. Nevertheless, forensic dental training is not always an integral part of undergraduate dental curricula in many countries.

In 2001, the Department of Dentistry at KU Leuven established the **Master's Programme in Forensic Odontology** as one of the few programmes of its kind in the world. This one-year, full-time, international postgraduate programme covers all relevant topics in forensic dentistry, including forensic medicine and forensic anthropology. The programme is in session from mid-September to the end of August.

The aim of the programme is to provide students with thorough knowledge and practical skills in the field of forensic odontology. While no single case is alike and many cases – especially disasters – are difficult to prepare for, the programme provides a sound and scientific foundation on which students can rely in their future careers.

Admission requirements

Applicants must hold a master's degree in dentistry or an equivalent degree allowing them to practice dentistry in their country of origin. The candidate should:

- have a demonstrated interest in science,
- be eager to learn,
- have a critical mind,
- be accurate and have an eye for detail,
- be able to work in teams,
- be communicative and social,
- have a good knowledge of English,
- be able to analyse and synthesize problems,
- be in good mental and physical health and be able to cope with highly stressful situations,
- be able to concentrate and take decisions,
- have knowledge of basic science such as mathematics, physics, chemistry, and biology, and
- be proficient in dental science.

Application

Non-Belgian students must submit an application via the International Admissions and Mobility Unit of KU Leuven. Deadlines for applications are **1 March** for non-EEA citizens and **1 June** for EEA citizens.

For more information about how to apply, contact the programme director of visit:

www.kuleuven.be/admissions

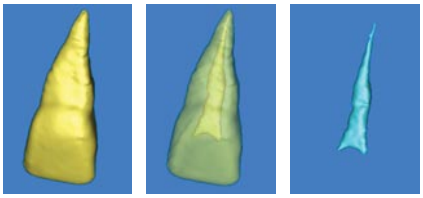
Curriculum

The curriculum consists of 60 ETCS (one year of full-time study) and includes theoretical courses, self-directed learning, preclinical training and demonstrations in the field of forensic odontology and related disciplines such as forensic medicine, forensic child abuse investigation and forensic anthropology. In particular, the programme provides insight into specialty techniques and their scientific background in forensic odontology.

The evidence-based and research-oriented teaching, the multidisciplinary and integrated case analysis and the comprehensive approach to identification, dental age estimation and bite mark analysis are important characteristics of this master's programme.

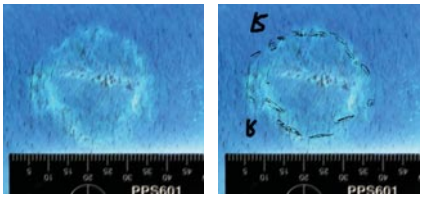
Topics and subtopics treated in the programme include:

- **Human dental identification**: uniqueness of the dental organ, comparative dental identification, reconstructive post mortem dental profiling, forensic DNA profiling method on oral tissues, problems with dental identification, ABFO identification guidelines
- **Mass disaster response**: body recovery team, victim identification organisation, forensic dental organisation, post mortem dental exam and radiology section, ante mortem vs. post mortem dental record comparison, body release, Interpol, DMORT
- **Dental age estimation**: age estimation based on tooth development and post developmental dental changes as well as digital analysing techniques



Dental age estimation. Cone beam CT data renders volumetric information on tooth/pulp ratios leading to dental age estimations in living and dead individuals.

- **Bite mark analysis**: description of bite marks, bite mark recognition, bite mark registration, evidence collection on suspects, comparison methods, guidelines on bite mark analysis and management, reporting of bite mark analysis, research on bite mark analysis



Bite mark analysis. Digital overlays of suspect's teeth are produced and compared to bite marks of teeth on the original bite mark photo. From the results of that comparison possible suspects may be excluded as the perpetrator.

- **Digital analysis of bite mark evidence**: scanning bite mark photographs, detecting and correcting photographic distortion, resizing photographs, printing and enhancing and adding text, scanning suspects' casts, overlay fabrication, comparison methods.

Master's thesis

The **master's thesis** is an essential part of the curriculum and enables students to familiarise themselves with the different steps in combined forensic odontology and biomedical research:

- formulation of a research hypothesis,
- elaboration of a research protocol,
- actual experimental work, data analysis and interpretation,
- drawing conclusions and writing a scientific report worthy of publication in an international peer reviewed journal.

Students also complete a **master's apprenticeship**. The first part of the master apprenticeship consists of the actual research activity under the supervision of a faculty member. In the second part, the students write a report on their research activities in the format of a research paper that has to be accepted for publication after submission to an international peer reviewed journal. The research work for the master's thesis will be performed in one of the research units of the Dental School. The thesis research will be performed throughout the academic year. Wondering which **research topic** to choose? In general, any topic related to forensic odontology might be a suitable topic. On the website of the master programme (www.mfo.be) is a list of master theses of students who have successfully graduated from the master programme as well as of research performed by the faculty members.

Career outlook

Graduates go on to careers as forensic odontologists. This job entails three major aspects: human identification, dental age estimation and bite mark analysis.

Human identification is perhaps the most important of the three major aspects. Depending on the case, the odontologist might be confronted with a single identification or multiple identifications related to an isolated accident or a mass disaster, respectively. In some cases, human remains may be fragmented or completely destroyed. As a forensic odontologist, you will perform the dental autopsy and gather post-mortem information. Once ante-mortem information is collected from the victim's general practitioner, you will synthesise both types of information to attempt to identify the remains.

Dental age estimation may be performed from birth to death and are also important in the identification process of human remains. In the living, dental age estimations are most frequently performed on unaccompanied minors trespassing the borders of the country.

Bite mark analysis is mostly related to criminal cases like murder, sexual assault, child abuse and elderly neglect. While the method is controversial, its primary strength lies in ruling out potential suspects. Furthermore, forensic odontologists are also actively involved in dental fraud and litigation cases.

PHD IN FORENSIC ODONTOLOGY

The master's programme can serve as a valuable preparation year for students aspiring to go on to doctoral studies in forensic odontology. Time spent in the master's programme can count toward your PhD training programme as long as the topic of your doctoral dissertation builds on the research conducted as part of you master's thesis. In most cases, a typical PhD track constitutes about four years of intensive research and study.

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