MSc in Fire Safety Engineering

EUROPEAN JOINT MASTER'S PROGRAMME

- Master of Science in Fire Safety Technology
- 2 years, 120 ECTS credits
- European joint Master's programme
- Lund University, Ghent University, the University of Edinburgh
- Application deadline – See www.imfse.ugent.be
- Programme start – See www.imfse.ugent.be

Programme overview

The International Master of Science in Fire Safety Engineering (IMFSE) is a two-year educational programme in the Erasmus Mundus framework. This Master's programme is organised jointly by:

- **Ghent University, Belgium (coordinator)**
- **Lund University, Sweden**
- **The University of Edinburgh, UK**

These three leading European research universities with complementary expertise in the field of Fire Safety Engineering (FSE) join together with the main objective of creating an educational programme that defines the required knowledge for a professional fire safety engineer, capable of developing a Performance Based Design (PBD). The three IMFSE universities are leading European institutions in the field of fire safety, providing both educational programmes and high-level research. Ghent aims at general FSE, Lund is recognised in enclosure fire dynamics, CFD modelling, human behaviour during fires and evacuation and towards methods for risk assessment, and Edinburgh is the developer of the first curriculum in structural fire safety engineering.

The consortium has three associated partners: ETH Zürich, Switzerland, The University of Queensland, Australia and the University of Maryland, USA.

IMFSE also involves 7 industrial partners as official sponsors. With their annual financial contributions, it has been possible to create the 'Sponsorship Consortium' which awards IMFSE students full or partial scholarships.

The IMFSE programme consists of four semesters of 30 ECTS credits each. The mobility structure, with possible change in study location after each semester, gives the students the opportunity to gain from the strengths and expertise of each of the three universities.

The classes in the first semester can be attended in Ghent or Edinburgh. All students spend the second semester in Lund. In the third semester, classes are again taught in Ghent (for general FSE) or Edinburgh (with focus on structural engineering in the context of FSE). The fourth semester is devoted to the Master's thesis, hosted by one or more of the three institutes.

Fire Safety Engineering

Fire Safety Engineering is a multidisciplinary field that requires a deep understanding of building design and construction, the thermo-chemical processes associated to fire growth, human behaviour and the representation of the many uncertainties through risk assessments. A Fire Safety engineer fulfils a broad range of duties, all related to fire safety. This can range from designing fire protection for a space station, to ensuring that the occupants of buildings are safe from fire. Fire Safety engineers have always been in great demand by industry, insurance companies, rescue services, educational institutions, consulting firms, and government bodies around the world.

Currently, the extreme need for FSE in Europe and around the world is leading to a proliferation of remedial short courses and a few low-level higher education degrees that are not founded on a strong knowledge and experience base. These programmes are delivering professionals with degrees to a practice that has no definition of competence. Thus the transformation of the field is slow, with many mistakes being made and a deep- seeded confusion of the skills required for an adequate PBD.

The major educational objectives of this programme are that the Master's students:

- are able to critically evaluate and construct an original, performance based, fire safety design;
- understand the complexity and evolution of the design tools and the many existing gaps of knowledge and limitations;
- understand the current research trends and are able to subsequently perform scientific (PhD level) research in the domain of FSE;
- gain an awareness of the professional context and the broad problems in FSE;

The detailed educational objectives of this programme are that the Master's students:

- can evaluate and make a motivated choice of different types of fire detection and suppression (passive and active) and develop a quantitative performance assessment;
- can identify structural weaknesses in fire and provide a quantitative assessment of performance;
- can make detailed risk analyses;
- can establish quantitative egress patterns in case of fire;
- have knowledge on national and international (especially European) regulation;
- can collaborate with FSE colleagues.

Programme modules/courses

COURSES AND NUMBER OF ECTS CREDITS:

- **Semester 1 (mobility track 1) Ghent University (G):** Fire Dynamics, Basics of Structural Engineering, Thermodynamics, Heat and Mass Transfer and one of the following electives: FSE Based Fire fighting, Modelling of Turblence and Combustion, Turbomachines, Introduction to Entrepreneurship.
- **Semester 1 (mobility track 2) University of Edinburgh (E):** Fire Science and Fire Dynamics, Engineering Project Management, Fire Safety, Engineering and Society, Fire Safety Engineering.Semester 2 Lund University (L): Risk Assessment (8), Advanced Fire Dynamics (9), Human Behavior in Fire (8), Simulation of Fires in Enclosures (5).
- **Semester 2, Lund University (L):** Risk Assessment, Advanced Fire Dynamics, Human Behaviour in Fire, Simulation of Fires in Enclosures.
- **Semester 3 (mobility track 1), Ghent University (G):** Explosions and Industrial Fire Safety, Passive Fire Protection, Active Fire Protection I: Detection and Suppression, Active Fire Protection II: Smoke and Heat Control, Fire Safety and Legislation, Performance-Based Design.
- **Semester 3 (mobility track 2), University of Edinburgh (E):** Fire Science Laboratory, Structural Design for Fire, Fire Safety, Engineering and Society, Finite Element Analysis for Solids.
- **Semester 4: Master's thesis:** can be performed at the associated partners or at other universities, industry or research institutes.

CONTACT
Programme webpage
www.imfse.ugent.be
www.lunduniversity.lu.se/fire-safety

Entry requirements and how to apply

ENTRY REQUIREMENTS

A Bachelor's degree or recognised equivalent from an accredited institution (minimum 3 years full-time study or 180 ECTS credits) in civil, structural, mechanical, electrical, chemical, industrial engineering, material sciences, chemistry, physics, applied physics, architecture, urbanism and spatial planning or a related discipline. Students in their last year of such a Bachelor's programme will also be considered. Sufficient English language ability is also an admission requirement. See www.imfse.ugent.be for detailed information about the entry requirements.

HOW TO APPLY

See www.imfse.ugent.be for detailed application instructions, application forms and deadlines.

TUITION FEES

For details on tuition fees and scholarships, see www.imfse.ugent.be

About Lund University

Lund University was founded in 1666 and is repeatedly ranked among the world's top 100 universities. The University has 41 000 students and more than 7 500 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition.

Lund is Sweden's most attractive study destination. The University offers one of the broadest ranges of programmes and courses in Scandinavia, based on cross-disciplinary and cutting-edge research. The compact university campus encourages networking and creates the conditions for scientific breakthroughs and innovations. The University has a clear international profile, with partner universities in over 70 countries.

Learn more at **www.lunduniversity.lu.se**

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