



**POST-GRADUATE  
SPECIALISED  
MASTER'S DEGREE**

**TUNNELS AND  
UNDERGROUND STRUCTURES**  
*from design to operation*



# Objectives:

Postgraduate training course for engineers in Civil Engineering who aim to obtain:

- A solid knowledge in the scientific and technical fields related to tunneling and underground work;
- A good sense of the concept of risks at all stages, while incorporating environmental and sustainable development constraints.
- A good knowledge of project overview, from the start phase until the completion, including constraints related to operating the structure.
- Understanding the regulations aspects.

# Partners:

## Academic

- INSA Lyon (French Technical University - Lyon)
- ENTPE (French National School of Public Works)

## Professionals

- French Association of Tunnelling and Underground Space (AFTES)
- Centre of Tunnel studies (CETU)

## International

- International Tunneling Association and Underground Space (ITA): this specialised Master programme has obtained ITA/AITES endorsement

# Structure of the course:

- ***One teaching semester***
  - Theoretical lectures, assignments and specific seminars (316 hours)
  - A group project covering all design and construction stages (150 hours tutorials)
- ***Five-month internship within a professional environment (March – July)***
  - Tutored by the faculty and the host company.
  - Followed by supported professional thesis.
- ***Tutorials are given by industry leaders and experts from France and other foreign countries.***

# The programme:

<b>Classes and project</b>	<b>Classes</b>	<b>Lectures</b>	<b>ECTS*</b>
<b>Basics/Foundations</b>	<b>60 hrs.</b>		<b>6</b>
<b>General project approach</b>	<b>46 hrs.</b>	<b>12 hrs.</b>	<b>6</b>
<b>Construction techniques</b>	<b>54 hrs.</b>	<b>20 hrs.</b>	<b>7</b>
<b>Design</b>	<b>59 hrs.</b>	<b>4 hrs.</b>	<b>6.5</b>
<b>Equipment and safety during the operational phase</b>	<b>28 hrs.</b>	<b>6 hrs.</b>	<b>3</b>
<b>Tunnel asset management</b>	<b>24 hrs.</b>	<b>3 hrs.</b>	<b>2.5</b>
<b>Project</b>	<b>150 tutored hours</b>		<b>14</b>
<b>Work placement</b>	<b>5 months</b>		<b>30</b>

\* European Credit Transfer System

## Course fees:

**Salaried employees**

**15 000 Euros (Incl. VAT)**

**Employees with paid leave**

**15 000 Euros (Incl. VAT)**

**Students & job seekers:**

**7500 Euros (Incl. VAT)**

Financial assistance can be given to French & foreign students, job seekers on presentation of valid documents, and after a review of the committee.

## Location of classes

The course is taught in Lyon (France) at INSA and ENTPE.

## Contacts and information:

Web site: <http://mstunnels.insa-lyon.fr>

Responsible of the Master programme :

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## Session planning 2011-2012

- Application : 1st June 2011
- Candidats selections : beginning of July 2011
- Admission results : 15th July 2011
- Launching of the course : 1st October 2011
- Internship : 1st March 2012 – 31st July 2012