

POST GRADUATE MASTER COURSE

Tunneling and Tunnel Boring Machines

VI Edition 2007/2008



sistema
qualità
certificato



The Second Level International Post Graduate Master Course in “**Tunnelling and Tunnel Boring Machines**” established by Politecnico di Torino (Italy) in partnership with COREP.

COREP is a no-profit consortium created in 1987 on the initiative of the three Piedmont Universities – Polytechnic of Turin, University of Eastern Piedmont “A. Avogadro” – local bodies and important Italian industries and associations. One of the main goals of COREP is to provide high qualifying training services to young graduates in order to facilitate their entrance in the labour market, promoting the cooperation between universities and socio-economic actors. Since 1999 COREP is certificated UNI EN ISO 9001:2000 for the design and delivery of education and training activities.

The Master is endorsed by :



under the patronage of SIG ITALIAN TUNNELLING SOCIETY



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Director:

Prof. Sebastiano Pelizza, Dipartimento di Ingegneria del Territorio, dell'Ambiente e delle Geotecnologie, Politecnico di Torino

Assistant Director:

Prof. Daniele Peila, Dipartimento di Ingegneria del Territorio, dell'Ambiente e delle Geotecnologie, Politecnico di Torino

COREP Organizational Coordinator of the Master:

Dr. Katia Morelli

COREP Secreteriat Office

C.so Trento, 13 - 10129 Turin - Italy

Tel 011.564.51.07 - **Fax** 011.564.51.10

E-mail: formazione@corep.it

Web: www.formazione.corep.it

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1. WHY THIS MASTER?

The goal of the Master, the only one in the world to be officially recognized by the International Tunnelling Association, is to give to young engineers and employees coming from the public administration and the industry, specific skills about the design of tunnels to be bored both by full face machines and by conventional tunnelling and about the management of tunnel job sites.

2. JOB OPPORTUNITIES

The students who followed the Post-graduate Master Course are of interest for the design firms, the construction companies involved in tunnelling and for the tunnelling tools suppliers as well as the producers of tunnel boring machines.

The Public Administration and the tunnel owners can also find interest in the skills gained during the course

3. ADMISSION REQUIREMENTS

Graduate MSc in Engineering and Geology, Company and Public Administration Employees involved in tunnelling design and management of job sites. The selection of the students is based on the curricula.

The course working language will be English.

4. MASTER LOCATION

The lectures and exercises are held at COREP, C.so Trento, 13, Torino,. The Stage will performed in Italy and/or abroad.

5. PROGRAMME

The Post-Graduate Master Course on "Tunnelling and Tunnel Boring Machines" will be held from November 2007 to October 2008. It involves about 450 hours of face-to-face lessons and classroom exercises, 2 months of stage in a tunnel construction site or in a tunnelling design company and a thesis work. This Course is worth 60 academic credits. The class lessons last 6/8 hours a day, 5 days a week. The official language of the course is English.

The Post-Graduate Master Course is organized in 3 main modules:

- Tunnel design and construction methods
- Mechanized tunnelling
- Management and safety of job sites

6. STAFF

Director: Prof. Sebastiano Pelizza, Dipartimento di Ingegneria del Territorio, dell'Ambiente e delle Geotecnologie, Politecnico di Torino

Assistant Director: Prof. Daniele Peila, Dipartimento di Ingegneria del Territorio, dell'Ambiente e delle Geotecnologie, Politecnico di Torino

Lecturers:

Airoidi S.	Atlas Copco CMT
Amberg F.– Dickmann T.	Amberg Engineering Ltd, ITA WG 14 "Mechanized Tunnelling", (Switzerland)
Anagnostou G.	Professor, ETH - Swiss Federal Institute of Technology - Zurich (Switzerland)
Arrigoni G.A.	Consultant, FICE, Fellow Chartered Institute of Arbitrarians
Artigiani E.	Golder Associates srl
Assis A.	Professor, University of Brasilia – Former President ITA/AITES (Brasil)
Barbero M.	Researcher, Politecnico Torino
Barla G.	Professor, Politecnico di Torino
Bertino E.	Cifa S.p.A.
Bilgin N.	Professor, Istanbul Technical University, Faculty of Mines (Turkey)
Borgonovo G.	Golder Associates srl
Brino L.	Lyon-Turin Ferroviaire
Cardu M.	Professor, Politecnico di Torino
Concilia M.	Todini Costruzioni S.p.A.
Cravero M.	CNR – IGAG Torino
Dal Negro E.	Mapei S.p.A.
Della Valle N.	Consultant – Technical Director L9 Metro Barcellona (Spain)
Forchino F.	P.M. & E. Project Management & Engineering srl
Gecchele G.	Professor, Politecnico di Torino
Lovat R.- Giorelli M.	Lovat inc. (Canada)
Grandori R.	S.E.L.I. S.p.A.
Grasso G.	Geodata S.p.A. – ITA/AITES Vice President
Gruebl F.	Professor, Stuttgart University – PSP Consulting Engineers – (Germany)
Guardini C	Research Assistant, Politecnico di Torino
Guglielmetti V	Consultant
Iabichino G.	CNR – IGAG Torino
Innaurato N.	Professor, Politecnico di Torino
Knights M.	Jacobs Ltd – President ITA-AITES (UK)
Kovari K.	Professor, ETH – Swiss Federal Institute of Technology – Zurich (Switzerland)
Marchionni M.-Rhem U.	Herrenknecht
Morino A.	Gdtest S.p.A.
Narvaez G.	Golder Associates srl
Nicola A.	Impreglio S.p.A.
Oggeri C.	Researcher, Politecnico di Torino -
Oreste P.	Professor, Politecnico di Torino
Palmieri S.	Palmieri S.p.A.
Patrucco M.	Professor, Politecnico di Torino
Peila D.	Professor, Politecnico di Torino - ITA-AITES WG 18 Animateur
Pelizza S.	Professor, Politecnico di Torino - Former President ITA/AITES
Pescara M.	Geodata S.p.A.
Petrucco V.	ICOP S.p.A.
Pichler J.	Sandvik Mining and Construction
Plizzari G.	Professor, University of Bergamo
Ricci G.	Geodata S.p.a.
Roberds B.	Golder Associates Inc.
Russo G.	Geodata S.p.A.
Salminen P.	Sandvik Mining and Construction
Sambuelli L.	Professor, Politecnico di Torino
Schulkins R.	Mapei Far East (Singapour)
Smirnov T. P.	Parsons Brinckerhoff Quade & Douglas, Inc. (USA)
Soldo L.	Geodata S.p.A.
Sorlini A.	Geodata S.p.A.
Sterling R.	Professor, Louisiana Tech. University - (USA)
Torta P.	P.M. & E. Project Management & Engineering srl
Wagner H.	D2 consultant, (Austria)

7. HOW TO APPLY

In order to apply for a Master or a specializing Course please fill in the Subscription Form (download: [.doc](#) or [.pdf](#) at http://www.formazione.corep.it/iscrizione_en.htm) and send it by the deadline in one of the following way:

- by electronic mail (iscrizioni@corep.it)
- by fax (+ 39 011 564.5110)
- hand delivered to Master Corep Secretariat (Corso Trento, 13 – 10129 Turin, ITALY)
- by ordinary mail. Please send a closed envelope to: Segreteria Master Corep (Corso Trento, 13 – 10129 Turin, ITALY)

The deadline to apply is:

14th September 2007 for NOT Italian students

12th October 2007 for Italian students

Following documentation (the list of documents is also provided in Italian at the Note ¹) must be provided in attachment:

- **ALL STUDENTS** must also enclose:
 - the Subscription Form (download: [.doc](#) or [.pdf](#))
 - Copy of the MSc (or MSc equivalent) degree together with the transcript of records of the sustained examinations
 - Curriculum Vitae according to the European standard (Europass CV in [.doc](#) or [.pdf](#) format). It must include the authorization to the treatment of the personal data (Italian DL 196/2003). In any case **the curriculum must be sent in electronic format to iscrizioni@corep.it**
 - 1 passport photo with name and surname reported on the back (if the application has been sent by email, the photo is not mandatory, but has to be provided in case of admission.)
 - Copy of a passport or identity card valid
 - Copy of "Codice Fiscale" (Italian individual tax code)
It is obtainable at the "[Agenzia delle Entrate](#)" local office (Italian Internal Revenue Service)) by presenting a document of identification (foreigners must present Passport or Permit of Stay).
Residents abroad can refer also to Italian Consulates. [For further information](#)

¹ Note

- Domanda di iscrizione (in formato [.doc](#) o [.pdf](#))
- Certificato di laurea con esami; per laureandi certificato degli esami con voti. È ammessa anche l'autocertificazione (in formato [.doc](#) o [.pdf](#));
- Curriculum vitae secondo lo standard europeo (Europass CV in formato [.doc](#) o [.pdf](#)). Il curriculum dovrà riportare in calce l'autorizzazione al trattamento dei dati personali (D.Lgs.196/2003);
- 1 fotografia formato tessera con indicati nome e cognome sul retro (se la domanda viene spedita in formato elettronico, la fotografia non è obbligatoria, ma deve essere consegnata in caso di selezione);
- copia di un documento di identità in corso di validità (Carta di Identità o Passaporto)
- Copia del Codice Fiscale
Richiedibile presentandosi all' [Ufficio locale dell'Agenzia delle Entrate](#) con un documento di riconoscimento (gli stranieri devono presentare passaporto o permesso di soggiorno). I residenti all'estero possono rivolgersi anche ai Consolati, se collegati al sistema informativo dell' Anagrafe Tributaria.
[Per maggiori informazioni \(http://www.agenziaentrate.it/ilwcm/connect/Nsi/Servizi/Codice+fiscale+-+Tessera+Sanitaria/Codice+fiscale/\)](http://www.agenziaentrate.it/ilwcm/connect/Nsi/Servizi/Codice+fiscale+-+Tessera+Sanitaria/Codice+fiscale/)
- Titolo della tesi accompagnato da una breve sintesi (massimo una pagina) della medesima;
- Modulo "Condizione Professionale Prevalente"(in formato [.doc](#) o [.pdf](#)).

(<http://www.agenziaentrate.it/ilwwcm/connect/Nsi/Servizi/Codice+fiscale+-+Tessera+Sanitaria/Codice+fiscale/>)

- Title of the MSc (or MSc equivalent) final project together with a short summary of its contents (max one page)
- Form: “Main Professional Condition” (to be provided only for courses supported by the European Social Fund), (in [.doc](#) or [.pdf](#) format). This form is mandatory only for people interested to apply for a Master or a course approved and funded by the European Social Fund. For the others, it is not mandatory to fill in this form, but optional.
- **STUDENTS WITH ITALIAN DEGREE** must also enclose:
 - Degree thesis with all exams. For final year student it is sufficient a certificate of exams with marks. It's also accepted the self declaration ex art. 445/2000, articles 46-47 ([doc](#). or [pdf](#)).
- **STUDENTS WITH FOREIGN DEGREE** must also enclose:
 - declaration of value and certificate with the translation of all the passed exams. This declaration must be requested to the Italian Consulate in the country where the student had the degree. Community citizens may submit certified copies of the titles about the Declaration of Value. Extra-community citizens have to submit originals of the titles about the Declaration of Value.
- **FOREIGN STUDENTS FROM COUNTRIES INDICATED IN THE VISA SYSTEM AND THE ENTRY OF ALIENS INTO ITALY AND THE SCHENGEN AREA** (www.esteri.it/visti/home.asp) **LIVING IN ITALY** must also enclose:
 - Entry Visa and residence permit
- **FOREIGN STUDENTS FROM COUNTRIES INDICATED IN THE VISA SYSTEM AND THE ENTRY OF ALIENS INTO ITALY AND THE SCHENGEN AREA** (www.esteri.it/visti/home.asp) **NOT LIVING IN ITALY** must also enclose:
 - a motivational letter if, according with the Selection Commission, the interview will not be in presence;

Incomplete application forms won't be considered as valid.

The COREP Secretariat Office will send an acknowledge of receipt (by phone or by e-mail) of the application in 3 working days. If you don't receive any communications, please contact our Office by phone or e-mail
For more info please call the Info-Point: Tel +39 011 5645107. E-mail: formazione@corep.it

CONFIRMATION OF REGISTRATION

At the end of the selection a definitive classification list of the eligible candidates will be written. These candidates will receive, subject to available places, the proposal to be registered to the Master. The student will regularize the registration through the apposite form (“Confirmation of registration”).

It is correct to specify that:

- **STUDENTS WITH ITALIAN DEGREE** will have to deliver copy of the original of the Thesis Degree.
- **FOREIGN STUDENTS FROM COUNTRIES INDICATED IN THE VISA SYSTEM AND THE ENTRY INTO ITALY OF ALIENS AND THE SCHENGEN AREA** (www.esteri.it/visti/home.asp) before to regularize the registration about the form (“Confirmation of registration”), must give to the Secretary, within expiration date, the Visa of entrance for study reason type D with multiple entrances and the residence permit.

Further information about documents for foreign students are available on the site: www.esteri.it/visti/home.asp

Personal data will be used by COREP according to Italian laws (Article n. 13 Legislative decree n. 196/03).

8. SELECTION OF APPLICANTS

The selection is based on the curricula of the applicants and on oral interview. A Selection's Board, made up of the Director, the COREP Organizational Coordinator and some university teachers, will examine all submitted application forms and curricula and reject those not complying to the general requests to be enrolled in the Master Course.

The selected applicants, will then be admitted to an oral interview. At the end of the selection process a classification of the successful applicants will be provided. These will be enrolled in the Master Course according to the position in the classification and to the number of available places.

For foreign students the oral interview is not mandatory and can be replaced by a motivation letter that must be sent together with the application.

9. TUITION FEES AND CONDITIONS FOR THE MASTER TO BE ACTIVATED

The tuition fee is **4200,00 Euro**.

Participants are responsible for the journey and accomodation while in Torino.

The Master Course will be activated on condition there are at least 10 students.

Two scholarships of 4.200 Euro are available for **foreign participants**, covering the total amount of the tuition fee.

Scholarships will be assigned only between people who have sent the application form before the 30th July. The winners of the scholarships will then have to confirm their participation by the 17th September otherwise the scholarship will be reassigned.

One scholarship for Italian student covering the enrolment fee (4.200 Euro) is assigned by ISPI (Istituto Superiore per le Infrastrutture) - Politecnico di Torino.

The scholarship will be assigned on the base of the admission forms arrived until the 5th October.

Evaluation criteria for the scholarships are public and will be delivered to students at the oral interview (or can be requested to the COREP Organizational Coordinator).

Once the Master class has been composed, the Selection's Board will provide the classification for the scholarships.

Since COREP is a private company and in order to respect the privacy of the participants, details of the classification won't be provided.

It will be also possible to follow single modules, whose fees are:

- 1st module (Tunnel design and construction methods): 1200,00 €
- 2nd module (Mechanized tunnelling): 2000,00 €
- 3rd module (Management and safety of job sites): 1200,00 €

10. ATTENDANCE, EVALUATION AND DEGREE AWARDING

A Master Thesis followed by a discussion concludes the course and finally leads to the award of the Master degree by Politecnico di Torino (60 University Credits).

In order to get the Master degree the participants have to attend at least to 2/3 of the lectures hours (certificated by signature), to pass all foreseen examinations and to successfully conclude the Project Work activities.

To be entitled to obtain the University Master degree, the Italian students must comply to the Italian requirements stated by the law on education T.U. of 1933 art. 142 (simultaneous enrolment in other universities courses, doctorates, etc...is not admitted).

11. COURSE ORGANIZATION

Weekly Programme Post Graduate Master:

INSEGNAMENTO	CREDITI	ORE AULA (1)	DOCENTE responsabile del corso
MODULO 1 TUNNEL DESIGN AND CONSTRUCTION METHODS 18 credits			
Tunnel Construction	1	10 L	Prof. Pelizza
Rock Mass Characterization and “geo” investigations	6	50 L 10 E	Ing. Oggeri
Conventional Tunnelling and Tunnel supports	8	70 L 10 E	Ing. Oreste
Risk Assessments	1	10 L	Prof. Peila
Ground reinforcing for tunnelling	2	10 L 10 E	Prof. Peila
MODULO 2 MECHANIZED TUNNELLING 18 credits			
General Aspects of mechanized tunnelling	2	15 L 5 E	Prof. Pelizza
Hard Rock Tunneling mechanized	4	30 L 10 E	Ing. Concilia (esterno)
Soft rock and ground mechanized tunnelling	6	50 L 10 E	Prof. Peila
Tunnels in difficult conditions	1	10 L	Prof. Peila
Plants	2	20 L	Prof. Pelizza
Microtunnelling	3	20 L	Prof. Sterling (Università Luisiana)
MODULO 3 MANAGEMENT AND SAFETY OF JOB SITES 9 credits			
Contractual and legislative aspects, work sites management, quality	3	30 L	Ing. Oggeri
Safety of work sites and equipment	4	40 L	Prof. Patrucco
Fire protection and environment	2	10 L 10 E	Prof. Gecchele
TESI	7	170	
VISITE TECNICHE	1	10	Prof. Peila/ Ing. Oggeri
STAGE	7	280	
TOTALE (2)	60	900	