Master of science in Civil Engineering

Programme mnemonic
MA-IRCN
- Focus *Professional* : M-IRCNE

Studies level
Master 120 credits

Learning language
english

Schedule
office hours

Studies category / subcategory
Sciences and technics / Sciences and technics

Campus
Other campus and Solbosch

Programme objectives

This course in civil construction engineering at the ULB trains graduates for a broad range of jobs in the construction sector, qualifying them for positions in technical consultancies and supervisory centres (construction design), general companies (site management), administration, etc. The training given relies on the knowledge of the properties of materials used, the understanding of structural mechanisms (geotechnics, structure stability), and develops general skills in construction (project management, architectural integration, environmental aspects). The pedagogical methods used encourage teamwork on projects and enable participants to develop the essential skills for pursuing a rewarding career. Together, these two sets of qualities mean that the training provided on this programme offers skills which are both geared towards specific applications whilst being versatile at the same time.

Programme's added value

The course programme focus relies on an equal presence of full-time teachers from the university and others teachers working mainly in public sector departments and national or international companies. In addition to this integrated approach, the Master's course also has an international dimension through the opportunity for students to go on Erasmus exchanges or to do their first year at the VUB.

- Organisation of internships
- Teaching in English in partnership withVUB
- An important set of bilateral agreements allowing an important Erasmus mobility

VUB

- An important set of bilateral agreements allowing an important Erasmus mobility

Teaching methods

The teaching methodologies are combining classical courses, exercises, and lab sessions, as well as many projects.

Succeed in your studies

Choose

The information and guidance counsellors at the InfOR-études [https://www.ulb.be/en/studies-info-desk-1] service will help you choose your studies throughout the year.

Succeed

Take part in preparatory courses [https://www.ulb.be/en/studies-info-desk-1] or get help to succeed [https://www.ulb.be/en/studies-info-desk-1] , before or during your studies.

Get help

Apply for financial aid, look for accommodation or a student job, get support [https://www.ulb.be/fr/aides-services-et-accompagnement/aid-services-and-support-1] for your specific needs.

International/Openness

Outgoing mobility is mainly organised through the Erasmus programme. A significant fraction of students study in partner institutions for a part of a year or a full year. Double diplomas also exist that allow outgoing mobility during the complete block 3 of BA and block 1 of MA, returning at ULB after the block 1 of MA.

The Master in Civil Engineering is organised jointly by VUB and ULB. This allows providing the students with an international

atmosphere, and benefiting from the courses and infrastructures from both institutions.

Job opportunities

The civil engineering activities represent an important part of the industrial activity in Europe. The nature of this field implies the diversity of activities: public services, building developments as well as industrial constructions. Due to their curriculum, the civil engineers studying at ULB may take part in various fields of activities: construction management, design in engineering offices, ...

The global education of civil engineers allows integrating in other fields of activities in which their expertise is valued: mechanical of aerospace industry, consultancy, IT industry, ...

Contacts

polytech@ulb.be

https://polytech.ulb.be/fr/les-etudes/masters/constructions-civiles

Jury Presidents
Johan GYSELINCK (Professional) and Didier Snoeck (Professional)

Jury Secretary
Emanuele GARONE

Master of science in Civil Engineering
Focus Professional

The programme aims at developing general skills for civil engineering applications, including the design and structural mechanics aspects, the mastering of geomaterials, project management skills, or integrated water resources management.

To reach these objectives, the MA programme is centered on the design methodology. Acquiring the required technological skills is based on the scientific knowledge and competencies developed during the BA.

Among the main axes of the programme, an emphasis is put on the simulation tools for structures and materials, which allow modelling physical reality by state of th art models treated mathematically or computationally.

Geotechnicall and environmental aspects also require specific approaches for natural materials (soils, rocks) that have to be dealt with in any construction project.

The courses, exercises and lab sessions are complemented with many projects and a Master Thesis. Three options (three modules) are available in MA2: structures, construction and geomaterials, water resources.

Bloc 1 | M-IRCNE | MA-IRCN

Compulsory common courses - Fundamentals in civil engineering - Block 1

ARCH-Y400 Design of concrete structures | Sven DE SUTTER (Coordinator)
5 credits [lecture: 24h, practical work: 36h] first term English

ARCH-Y405 Design of steel structures | Wim HOECKMAN (Coordinator)
5 credits [lecture: 24h, practical work: 36h] first term English

CNST-H401 Prestressed concrete | Stéphanie STAQUET (Coordinator)
3 credits [lecture: 18h, practical work: 18h] second term English

CNST-H406 Geotechnical engineering | Alessia Cuccurullo (Coordinator) and Pierre GERARD
5 credits [lecture: 24h, practical work: 36h] first term English

Compulsory common courses - Challenges in large civil engineering structures - Block 1

CNST-H418 Non linear modeling of materials and structures | Thierry MASSART (Coordinator)
4 credits [lecture: 24h, practical work: 24h] second term English

CNST-H420 Dynamics of structures | Arnaud DERAEMAEKER (Coordinator)
4 credits [lecture: 24h, practical work: 24h] second term English

CNST-H421 Structural analysis and finite elements | Peter BERKE (Coordinator) and Lincy Pyl
5 credits [lecture: 36h, tutorial classes: 24h] first term English

CNST-Y400 Experimental techniques for characterization of construction materials | Dimitrios ANGELIS (Coordinator)
4 credits [lecture: 24h, practical work: 24h] first term English

Compulsory common courses - Transversal skills and industrial applications - Block 1

CNST-H422 Sustainability in construction | Didier Snoeck (Coordinator)
4 credits [lecture: 24h, practical work: 24h] second term English

CNST-Y403 Digitalization in construction | Olivier Remy (Coordinator) and Rajan Dessai Filomeno Coelho
4 credits [lecture: 24h, practical work: 24h] first term English

PROJ-H406 Design project in civil engineering | Lincy Pyl (Coordinator), Youri CARLSON and Pierre GERARD
9 credits [lecture: 8h, project: 250h] second term English

PROJ-H407 Research Methods in Civil Engineering | Arnaud DERAEMAEKER (Coordinator), Dimitrios ANGELIS and Marijke Huysmans
3 credits [lecture: 12h, personal assignments: 60h] second term English

Project management - Block 1

Project management

One course chosen from the following

CNST-H423 (optional)
Architecture, engineering and construction project management | Philippe BOUILLARD (Coordinator)
5 credits [lecture: 36h, practical work: 24h] second term English

PROJ-H417 (optional)
Projet coopération au développement | Antoine NONCLERCQ (Coordinator)
5 credits [project: 150h] first and second terms French
Only on selection : see the Development Unit of the Polytechnic School of Brussels (http://polytech.ulb.be/en/international/development-cooperation)

PROJ-H418 (optional)
Hands-on learning: project manager (chef de projet) | Peter BERKE (Coordinator)
5 credits [project: 150h] first and second terms French

Master of science in Civil Engineering
Focus Professional

Bloc 2 | M-IRCNE | MA-IRCN

Thesis - Block 2

MEMO-H501 — Master thesis civil engineering | Arnaud DERAEMAEKER (Coordinator) and Danny VAN HEMELRIJCK
24 credits [mfe/tfe: 600h] | academic year | English

Semi-elective blocks - Block 2

2 blocks amongst the 3 must be chosen.

Semi-elective Blocks

Choose 2 blocks out of these 3

18 to 20 credits chosen from the following

An alternative chosen from the three following

Innovative design of civil engineering structures

CNST-H530 (optional) — Integrated structural design | Thierry MASSART (Coordinator) and Matthieu MALLIE
6 credits [lecture: 24h, practical work: 48h] | second term | English

CNST-Y404 (optional) — Lightweight composite structures | Eric MOUSSIAUX (Coordinator) and Tine Tysmans
4 credits [lecture: 24h, practical work: 24h] | first term | English

or

Geotechnologies for sustainable developments

CNST-H517 (optional) — Energy geomechanics | Pierre GERARD (Coordinator)
5 credits [lecture: 24h, practical work: 36h] | second term | English

CNST-Y501 (optional) — Groundwater modelling | Marijke Huysmans (Coordinator)
5 credits [lecture: 12h, tutorial classes: 24h, personal assignments: 24h] | first term | English

or

Reliability and monitoring in civil engineering

CNST-H409 (optional) — Robustness of Structures and Relibability of materials | Peter BERKE (Coordinator)
4 credits [lecture: 24h, practical work: 24h] | first term | English

CNST-Y405 (optional) — Structural health monitoring, maintenance and repair | Dimitrios ANGELIS (Coordinator)
4 credits [lecture: 24h, practical work: 24h] | second term | French

Elective Courses - Block 2

Select a number of credits to complete the 120 ECTS of the Master program from one or more of these packages. The individual courses of the semi-elective blocks above (other than the blocks selected by the student) can be included in the choice of electives, and are considered on equal footing with the courses in the list below.

Choose among the following list

16 to 18 credits chosen from the following

Electives : Structures

ARCH-Y402 (optional) — Spatial structures : design and analysis | Lars DE LAET (Coordinator)
4 credits [lecture: 24h, practical work: 24h] second term English

CNST-Y504 (optional) — Parametric design of transformable structures | Niels DE TEMMERMAN (Coordinator)
4 credits [lecture: 24h, practical work: 24h] first term English

CNST-Y507 (optional) — Steel bridges construction | Wim HOECKMAN (Coordinator)
3 credits [lecture: 12h, tutorial classes: 24h] second term English

Electives : Water resources

CNST-Y402 (optional) — Surface water hydrology | Jiri NOSSENT (Coordinator), Wim THIERY and Ann VAN GRIENSVEN
5 credits [lecture: 30h, tutorial classes: 30h] first term English

CNST-Y502 (optional) — Urban hydrology and hydraulics | Solomon SEYOUM (Coordinator)
5 credits [lecture: 12h, tutorial classes: 24h, personal assignments: 24h] first term English

CNST-Y509 (optional) — Surface water modelling | Ann VAN GRIENSVEN (Coordinator)
5 credits [lecture: 12h, practical work: 24h, personal assignments: 24h] first and second terms English

CNST-Y510 (optional) — Water Resources Management 2 : EU and International framework | Steven John EISENREICH (Coordinator) and Nora VAN CAUWENBERGH
5 credits [lecture: 24h, practical work: 12h, personal assignments: 12h] first term English

CNST-Y520 (optional) — Land-Climate dynamics | Wim THIERY (Coordinator)
5 credits [lecture: 30h, practical work: 24h] first term English

Electives : Building physics and architecture

CNST-H306 (optional) — Bioclimatic design | Ahmed Zaib KHAN MAHSUD (Coordinator)
5 credits [lecture: 36h, practical work: 24h] second term English

CNST-Y512 (optional) — Energy performance of buildings | Filip DESCAMPS (Coordinator)
6 credits [lecture: 24h, practical work: 48h] second term English

CNST-Y515 (optional) — Room acoustics
3 credits [lecture: 12h, practical work: 24h] first term English

Electives : Management, economics and law

CNST-Y511 (optional) — Human resources management
6 credits [lecture: 36h, tutorial classes: 4h, personal assignments: 130h] second term English

GEST-Y501 (optional) — Business Management and Entrepreneurship | Marc GOLDCHSTEIN (Coordinator)
3 credits [lecture: 33h] first term English

GEST-Y502 (optional) — Business Aspects of Technology: Factory of the Future
3 credits [lecture: 27h, personal assignments: 59h] first term English

URBA-H501 (optional) — Urban and construction law | Kim MORIC (Coordinator)
3 credits [lecture: 24h, field trips: 12h] second term English

Electives : Miscellanea

CNST-H312 (optional) — Geology and engineering geology | Pierre GERARD (Coordinator)
5 credits [lecture: 24h, practical work: 36h] second term English

LANG-H500 (optional) English for professional purposes | Alexander CORNFORD (Coordinator) and Matthew LANGSLEY
5 credits [tutorial classes: 48h, personal assignments: 12h] first and second terms English

PROJ-H502 (optional) Design project competition | Philippe BOUILLARD (Coordinator) and Vincent GERIN
4 credits [seminars: 30h, project: 90h] second term English

URBA-H500 (optional) Infrastructure and Mobility | Philippe BOUILLARD (Coordinator)
5 credits [lecture: 24h, tutorial classes: 12h, field trips: 30h, personal assignments: 30h] second term English

Electives : Internships

STAG-H501 (optional) Internship (60 days) | Frédéric ROBERT (Coordinator)
10 credits [work placement: 300h] first term English

STAG-H505 (optional) Internship civil engineering (2 months) | Lincy Pyl (Coordinator) and Marijke Huysmans
6 credits [work placement: 180h] academic year English

Free elective courses

Students have also the opportunity to choose courses among the courses of the 'transversal modules' of the School.
English : LANG-H500
Engineering and society : PROJ-H421 - GEST-H509 - BIME-G5505 - PHYS-F517
Sustainability : GEST-S492 - ENVI-F405 - CHIM-H504 - ENVI-F452 - ENVI-F454 - ELEC-Y514
Finance, accounting, management, marketing, logistics and quality : GEST-S101 - GEST-S318 - GEST-S421 - GEST-Y501 GEST-H501 - GEST-H502
Participation to a summer school : EDUC-H601

Free elective courses

Up to six credits chosen from the following

BIME-G5505 (optional) Interfaculty and interdisciplinary program in Healthcare Innovation | Hilde STEVENS (Coordinator)
5 credits [lecture: 40h, tutorial classes: 20h] second term English

CHIM-H504 (optional) Engineering aspects of circular economy | Prakash VENKATESAN (Coordinator)
5 credits [lecture: 24h, practical work: 36h] second term English

DROI-C5174 (optional) Approche interdisciplinaire du droit de la propriété intellectuelle/Interdisciplinary Approach to In | Julien CABAY (Coordinator)
5 credits [lecture: 24h] first term English/French

EDUC-H601 (optional) Summer School | Johan GYSELINCK (Coordinator)
5 credits [personal assignments: 5h] academic year English

ELEC-Y514 (optional) Sustainability : an interdisciplinary Approach | Cathy MACHARIS (Coordinator) and Waldo Galle
6 credits [lecture: 36h, practical work: 24h] academic year English

ENVI-F405 (optional) Climat: sciences et politiques | Frank PATTYN (Coordinator) and Louise Knops
5 credits [lecture: 40h] second term French

ENVI-F452 (optional) Environmental impact analysis and management | Wouter ACHTEN (Coordinator)
5 credits [lecture: 24h, practical work: 12h, project: 24h] first term English/French

ENVI-F454 (optional) Energie: Société et environnement | Michel HUART (Coordinator) and Nadine MATTIELLI
5 credits [lecture: 30h, practical work: 12h, project: 24h] first term French

GEST-H501 (optional) Logistics Engineering and Management | Alassane Ballé NDIAYE (Coordinator)
5 credits [lecture: 12h, tutorial classes: 36h] first term English

GEST-H502 (optional) Supply Chain Performance Analytics | Alassane Ballé NDIAYE (Coordinator)
5 credits [lecture: 12h, tutorial classes: 36h, personal assignments: 12h] second term English

GEST-H509 (optional) — unknown term

GEST-S101 (optional) — Comptabilité financière | Gilles GEVERS (Coordinator) and Laurent GHEERAERT
5 credits [lecture: 36h, tutorial classes: 8h] second term French

GEST-S318 (optional) — Introduction to theoretical finance | Laurent GHEERAERT (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h] second term English

GEST-S421 (optional) — Entrepreneurial ecosystems | Judith BEHRENS (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h] second term English

GEST-S492 (optional) — Energy policy, sustainability & management | Adel EL Gammal (Coordinator), Julien BLONDEAU and Michel HUART
5 credits [lecture: 36h, seminars: 24h] first term English

GEST-Y501 (optional) — Business Management and Entrepreneurship | Marc GOLDCHSTEIN (Coordinator)
3 credits [lecture: 33h] first term English

LANG-H500 (optional) — English for professional purposes | Alexander CORNFORD (Coordinator) and Matthew LANGSLEY
5 credits [tutorial classes: 48h, personal assignments: 12h] first and second terms English

PHYS-F517 (optional) — How To Make (almost) Any Experiment Using Digital Fabrication | Denis TERWAGNE (Coordinator)
5 credits [lecture: 24h, practical work: 24h] first term French

PROJ-H421 (optional) — Projet polydaire: expériences didactiques innovantes pour le secondaire | Simon-Pierre GORZA (Coordinator)
5 credits [project: 150h] academic year French