Master of science in Architecture and Engineering

Programme mnemonic
MA-IRAR
- Focus *Professional* : M-IRARE

Studies level
Master 120 credits

Learning language
english

Schedule
office hours

Studies categories / subcategories
Art / Architecture and urban planning, Sciences and technics / Architecture and / Sciences and technics

Campus
Other campus and Solbosch

Programme objectives

The Master in Architectural Engineering completes a study programme in which architecture and construction engineering are closely intertwined: the learning objectives combine the mastering of construction engineering with the skills to **design architecture**, that is: to create meaningful places that favour the well-being of their future users. Students are trained in the advanced scientific knowledge and attitudes proper to construction and architecture sciences and research. Students learn to design and detail complex sustainable buildings, with special focus on their functions, load bearing structure, their equipment and the technologies they require.

Students are trained in the design of sustainable, large-scale architectural projects, aiming at creating added value in complex (mainly urban) situations. Students learn to coordinate the planning and on-site building of architecture projects: they acquire specialist knowledge on organizing and directing projects and on mastering its technical aspects.

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Programme's added value

The specificity of the Master in Architectural Engineering at ULB is determined by the central position attributed to the construction process in the teaching of architecture. In addition, the role of the project supervisor, capable of running a complex building project, is highlighted. The teaching programme has a specific focus on the skills required to design, coordinate and carry out large-scale projects in a multi-disciplinary environment necessitating an advanced technical and scientific approach and following the principles of sustainable design and building.

The Master in Architectural Engineering is organized in English, together with the VUB (Vrije Universiteit Brussel) in the BRUFACE platform, which provides a multicultural and multilingual environment.

- Availability of an internship supported within a specific pedagogical framework
- Courses taught in English, jointly with VUB

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Teaching methods

The teaching methods combine theory lectures with exercises, seminars and lab sessions. The architecture studio is conceived as the heart of the teaching project and represents 1/4 of the course programme.

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

This Master is organised jointly with VUB and is taught in English. This allows the students to be embedded in an international context, and to benefit from the various courses and infrastructures from both institutions.

Job opportunities

The Master degree allows direct access to a broad range of professions in architecture and construction engineering, among which:

- Architectural engineer
- Architect
- Consultant engineer
- Research engineer
- Engineer in a consultancy or architecture office

The Master in Architectural Engineering also prepares for a career in research in architectural engineering or architecture.

Architectural engineers have access also to specific job opportunities, distinct from those open to architects and civil engineers. Large construction projects require, from the start of the design phase, up to the completion of the construction project, a project leader able to integrate and coordinate the aesthetic, programmatic, structural and technical aspects of the project. The evolution of the building industry and the equipment of contemporary architecture projects render this synthesis ever more complex and require an integrated

knowledge on HVAC, electricity, informatics, the physical behaviour of materials and structures and the principles of sustainable building.

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Contacts

polytech@ulb.be

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

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

Jury Secretary
Emanuele GARONE

Master of science in Architecture and Engineering

Focus Professional

Bloc 1 | M-IRARE | MA-IRAR

Compulsory common courses - Block 1

ARCH-H400 Sustainable urban Design Studio | Ahmed Zaib KHAN MAHSUD (Coordinator) and Hera Van Sande
8 credits [workshop: 240h] first term English

ARCH-H4002 Sustainable architectural design studio | Ahmed Zaib KHAN MAHSUD (Coordinator) and Hera Van Sande
8 credits [workshop: 240h] second term English

ARCH-H403 Research methods in architectural engineering research | Ine WOUTERS (Coordinator) and Ahmed Zaib KHAN MAHSUD
3 credits [lecture: 12h, practical work: 24h] second term English

ARCH-H406 Post-war history of construction and architecture | Rika DEVOS (Coordinator)
4 credits [lecture: 12h, practical work: 36h] first term English

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

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

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

ARCH-Y406 Structural renovation techniques | Ine WOUTERS (Coordinator)
4 credits [lecture: 24h, practical work: 24h] second term English

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

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

Electives MA1

Electives MA1

*Choice of **minimum** 9 ECTS among the following list exclusively. **Coursesthat have been already taken during the Bachelor curriculum cannot be selectedanymore.***

A total of nine credits chosen from the following

ARCH-Y008 (optional) Form-active structures | Lars DE LAET (Coordinator)
4 credits [lecture: 12h, practical work: 36h] second term English

ARCH-Y407 (optional) Theoretical reflection on architectural heritage | Stéphanie VAN DE VOORDE (Coordinator)
4 credits [lecture: 24h, practical work: 24h] first term English

CNST-H302 (optional) Soil mechanics | Alessia Cuccurullo (Coordinator)
5 credits [lecture: 24h, tutorial classes: 24h, practical work: 12h] first term English

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

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

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

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

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

Master of science in Architecture and Engineering

Focus Professional

Bloc 2 | M-IRARE | MA-IRAR

Pre-defined choice of compulsory courses - Block 2

Compulsory courses

3 courses to select among these 4

Three courses chosen from the following

ARCH-H502 (optional) — Theory of architecture and urbanism | Ahmed Zaib KHAN MAHSUD (Coordinator)
4 credits [lecture: 24h, practical work: 24h] first term English

ARCH-Y500 (optional) — Low energy design for sustainable buildings | Filip DESCAMPS (Coordinator)
4 credits [lecture: 12h, practical work: 36h] first term English

ARCH-Y501 (optional) — Daylighting in buildings | Valérie Ann JACOBS (Coordinator), Bertrand Deroisy and Clotilde Pierson
4 credits [lecture: 12h, practical work: 24h, personal assignments: 30h] first term English

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

Advanced design studio - Block 2

ARCH-H504 — Advanced Design Studio | Jonas Lindekens (Coordinator), Stéphane Meyrant and Laurent NEY
12 credits [workshop: 360h] academic year English

Master thesis - Block 2

MEMO-H507 — Master thesis architectural engineering | Rika DEVOS (Coordinator) and Stéphanie VAN DE VOORDE
24 credits [personal assignments: 600h] first and second terms English

Electives courses - Block 2

Choice of 12 credits

Choice of 12 credits among the following list, among the MA1 electives courses not chosen before, and among the 1 remaining course from the pre-defined courses list not taken by the student. Courses from other master programmes can also be selected up to 6 credits.

A total of 12 credits chosen from the following

Electives courses

ARCH-Y502 (optional) — Visual and non-visual aspects of lighting | Valérie Ann JACOBS (Coordinator), Soukaïna Brarou and Gertjan Scheir
4 credits [lecture: 12h, practical work: 36h] first term English

ARCH-Y503 (optional) — Bouwpraktijk | Nicolas DECLERCK (Coordinator)
5 credits [lecture: 60h] second term English

ARCH-Y504 (optional) Histories of Architecture | Pieter Martens (Coordinator)
6 credits [lecture: 60h] first and second terms English

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

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

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

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

CNST-Y404 (optional) Lightweight composite structures | Eric MOUSSIAUX (Coordinator) and Tine Tysmans
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

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

CNST-Y518 (optional) Bouwkundig ontwerp / Design of engineering constructions | Danny VAN HEMELRIJCK (Coordinator) and Charlotte Nys
5 credits [lecture: 24h, practical work: 36h] second term Dutch

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

SOCA-D494 (optional) Sociologie de la ville | Pierre LANNOY (Coordinator)
5 credits [lecture: 24h] first term French

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

STAG-H506 (optional) Internship architectural engineering (40 working days) | Lincy Pyl (Coordinator)
6 credits [personal assignments: 180h] first 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

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

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-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