

Bachelor of Science in Civil Engineering – Studying from a different perspective

Bern University of Applied Sciences
Architecture, Wood and Civil Engineering



01

Who we are

The study of civil engineering at Burgdorf goes back a long way. The first group of future civil engineers began their studies at what was then the Technical College in Burgdorf in 1892. The school has grown and developed steadily since that time. In 1964, the course was extended to cover six semesters. Since 2003, the bachelor's degree course in civil engineering has formed part of the Department of Architecture, Wood and Civil Engineering at Bern University of Applied Sciences.

As a result of the Bologna reforms, the diploma was replaced in 2005 by a bachelor's degree and, in 2009, the course was given a rating of «very good». It conforms to European EFQM norms.

The bachelor's degree in civil engineering is a manageable course with small classes and individual support for students. Joint study activities with students from the areas of architecture and wood engineering foster the interdisciplinary approach that these future professionals will need in their working lives.

Graduates holding the professional qualification of «Bachelor of Science in Civil Engineering» can go on to study for a master's degree. ●

02

The civil engineer's profession

The training involved in becoming a civil engineer is as multi-faceted as the profession itself. It ranges from hydraulic engineering to tunnel construction, and from the fundamentals of ecology to steel-frame construction; civil engineers carry out the most varied of construction projects. They think in a businesslike manner and are responsible for ensuring that their projects meet all the demands of safety, cost-effectiveness and environmental impact.

Anyone wanting to study civil engineering successfully must be interested in scientific and mathematical issues and enjoy tasks that involve planning and creativity.

Attractive jobs

Civil engineers find jobs with architectural and civil engineering firms, with insurance companies and banks, construction companies and with various departments of government at national, cantonal and local level.

Civil engineers are qualified to build and maintain:

- Buildings and structures in reinforced concrete, metal and wood
- Transport infrastructure, tunnels and bridges
- Power generation structures (such as power stations and dams)
- Pollution-control structures (such as sewage works, incinerators and noise barriers)
- Urban and traffic planning installations

Civil engineers have been in short supply for many years, meaning that a student graduating from Burgdorf with a bachelor's degree has excellent career prospects. ●



03

The course: practice and theory in one package

The Bachelor of Science in Civil Engineering course lasts six semesters. It meets current national and international educational requirements and, in technical terms, covers the entire professional spectrum.

The lecturers are committed professionals who integrate teaching and practical experience very closely. Study trips, project weeks, term papers and projects all guarantee a strong focus on practical experience. Interdisciplinary cooperation with the bachelor's degree courses in architecture and wood engineering offers a comprehensive insight into the construction industry as a whole. ●

04

Course organisation

The three-year bachelor's degree course leads to a professional university qualification. The course is aligned with the requirements of the construction industry, to meet its practical needs. Graduates of the course receive the protected academic title of Bachelor of Science in Civil Engineering, in compliance with the performance standards set by the Federal Office for Professional Education and Technology (OPET) and the Bologna reforms. This primary degree course can then be supplemented by a master's degree course either at home or abroad.

The course is made up of required and elective modules. The elective modules give the student an opportunity to decide the direction he or she wishes to take. The curriculum specifies which modules are required and which are open to choice.

In the first year, the foundations are laid that will allow the student to complete the second and third years successfully. The scientific groundwork is established, students learn initial technical competencies in civil engineering and general issues are covered in the module on engineering culture.

The scientific basics comprise mathematics, statics and physics. The technical basics are provided, to a large extent, by courses on materials and engineering structures. The fundamentals of the general module on engineering culture take the form of communication, German, English and engineering design.

During the second year, required modules provide the fundamentals for the specialised subjects of structural engineering and infrastructure. In the structural engineering module, students focus on issues relating to statics and construction, as well as on using concrete, steel and wood as building materials.

Students deal with issues specific to infrastructure in the infrastructure module. Additional topics are the provision of utilities and waste disposal, as well as transport issues, hydraulic engineering and geotechnical engineering. The students then learn to apply this theoretical knowledge to projects in practical terms.

During the third year, the main topics of structural engineering and civil engineering are dealt with in greater depth. In addition, more elective modules are offered. These cover topics such as reinforced concrete, construction dynamics, bridge engineering and composite construction, and the conversion of existing buildings. Other topics on offer are natural hazards, underground construction, hydraulic engineering and urban water supply and sanitary engineering, as well as road and railway building. The topics of the elective modules are kept up to date with technical developments in the construction industry.

Alongside these modules, the definitive professional touch is provided by thematic blocks on construction site management, project management and maintenance management.

Work during the final semester is dominated by various elective modules and by the final thesis. ●





Specialisation

Two specialised subjects, structural engineering and civil engineering, are taught from the third semester onwards. These specialisations allow graduates of the course to work on projects across the broad spectrum of issues that civil engineers can expect to deal with.

These are the skills and competencies taught as part of the two specialised subjects:

Structural engineering

- Solid construction
- Steel construction
- Timber construction

Civil engineering

- Geotechnical engineering
- Traffic engineering
- Hydraulic engineering

Structural engineering as a specialisation covers the teaching of skills and competencies for structural planning and calculation using steel, reinforced concrete and wood as building materials.

In the civil engineering specialisations, students are taught the competencies they will need for planning and operating infrastructure facilities.

Modules and ECTS credits

The bachelor's degree is the first professional qualification in a multi-tiered educational system. To be awarded a Bachelor of Science degree in civil engineering a student must first earn 180 credits under the European Credit Transfer System (ECTS) used across much of Europe. Teaching is structured into modules. Each module carries a certain number of ECTS points, known as credits, and generally consists of several classes. About half the hours of study take the form of contact teaching; the rest are spent in directed and self-directed learning. The work done in each academic year is worth 60 credits.

The education provided in the bachelor's degree course is Europe-compatible. It is based on intensive cooperation with national and international companies and institutions and is earned a high level of recognition in the industry. The educational concept allows for continuous career planning, from an apprenticeship through a vocational or higher school certificate to a leading position in industry, research or development.



Module Plan Bachelor of Science in Civil Engineering: 180 credits

Credits	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Semester 1	Mathematics & scientific basics Physics Physics 1 (4)				Statics Statics 1 (4)				Mathematics Mathematics 1 (8)								General topics Engineering culture 1 Communication d 1 (2) English (2) Engineering design 1 (2)				Fundamentals Fundamentals 1 Materials 1 (2) Engineering structures 1 (2) Geology 1 (2)				Specials 1 General topics Optional modules					
Semester 2	Physics 2 (4)				Statics 2 (4)				Mathematics 2 (6)								General topics Engineering culture 2 Communication d 2 (2) Engineering design 2 (2) History of Construction (2) Sustainability and Ecology (2)				Fundamentals Fundamentals 2 Materials 2 (2) Engineering structures 2 (2) Surveying (2)				Specials 2 General topics Optional modules					
Semester 3	General topics Law & Management Management (2) Law (2)				Fundamentals Fundamentals 3 Construction physics 1 (2) Informatics (2) Materials 3 (2)				Special Structural Engineering Special Structural Engineering 1 Statics 3 (4) Solid construction 1 (2)				Special Infrastructure Special Infrastructure 1 Hydraulics 1 (4) Soil mechanics 1 (2) Transport 1 (2)				Fundamentals SEM Statics Renovation		Project week 1 The culture of building 1		Specials 3 General topics Optional modules									
Semester 4	Fundamentals Fundamentals 4 Construction physics 2 (2) Construction informatics1 (2)				Special Structural Engineering Special Structural Engineering 2 Solid construction 2 (4) Steel construction 1 (2)				Special Infrastructure Special Infrastructure 2 Hydraulics 2 (2) Soil mechanics 2 (2) Transport 2 (2) Sanitary engineering 1 (2)				Special elective module SEM structural engineering (6) SEM infrastructure (6)				Project week 2 Surveying (2) week 1 (2)		Specials 4 General topics Contractor											
Semester 5	Special Structural Engineering Special Structural Engineering 3 Solid construction 3 (4) Steel construction 2 (2) Wood engineering 1 (2)								Special Infrastructure Special Infrastructure 3 Foundation engineering (2) Hydraulic engineering (2) Transport engineering 1+2 (2) Sanitary engineering 2 (2) Construction & business management (2)								Special elective module SEM structural engineering (6) SEM infrastructure (6)				Special project Structural engineering (4) Infrastructure (4)		Specials 5 General topics Optional modules							
Semester 6	Special elective module SEM structural engineering (16) SEM infrastructure (16)																Thesis (12)				Specials 6 General topics Optional modules									

Staying at the leading edge

As well as its Bachelor of Science in Civil Engineering, Bern University of Applied Sciences also offers a Master of Science in Engineering (MSE).

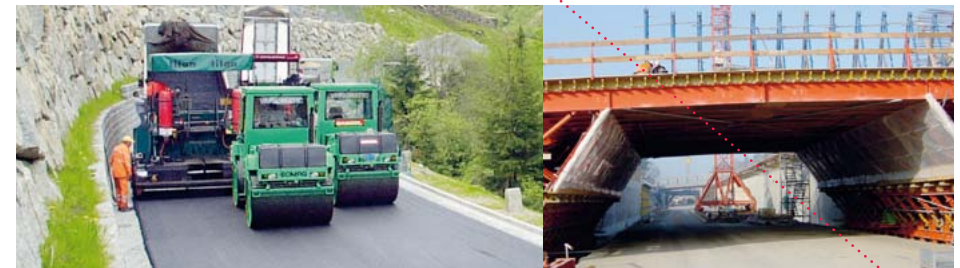
Switzerland's seven Universities of Applied Sciences developed this degree course jointly and theory classes are taught centrally. Students choose which UAS they want to attend for their specialised subject, the Master Research Unit (MRU).

The Department of Architecture, Wood and Civil Engineering at Bern University of Applied Sciences offers an MRU in Integral Planning and Construction. Master's degree students can deepen their knowledge of one or more of the following specialist subjects: Building Restoration and Building Physics, Timber and Composite Construction, or Natural Phenomena and Geotechnics.

By allowing students to choose to focus on one of these specialisations Bern UAS prepares them to take on important key positions in the planning and building of structures, as well preparing them for management functions. The course is closely linked to applied research and development at Bern UAS. Challenging projects of practical relevance, carried out in cooperation with partners from industry and using well-equipped laboratories, form an additional part of the educational programme. Students are also introduced to the relevant international professional networks. The course can be attended full- or part-time.

A wide range of further courses also allows practising professionals to remain up-to-date with developments. We offer MAS and CAS certification courses, conferences, seminars, courses, workshops and study trips.

The full range of what is available can be found here:
www.ahb.bfh.ch



Course beginning

Calendar week 38

Course duration

Full-time: at least six 6 semesters
Part-time studies are to be planned individually with the course administration.

Fees

CHF 600.– per semester
CHF 100.– registration fee
CHF 80.– examination fee per semester
CHF 90.– Charge for materials per semester

Admission requirements

- Completed vocational training in the construction industry, with Swiss national higher certificate of vocational education
- Higher school certificate from a higher school with practical internship or higher education Bern UAS offers students with a higher school certificate the chance to enter its Passerelle programme, which prepares them for technically-oriented UAS studies. Additional information can be obtained from the course administration or from www.passerelle.bfh.ch
- The course is also open to applicants from related vocational apprenticeships and preliminary training courses. The course administration will provide help with finding suitable internships

Advice and information events

A printed guide cannot address every issue. We therefore hold several **information events** each year at which we present our courses. We can answer individual questions and give advice on the personal requirements for our courses in a **face-to-face meeting**. These information events and individual meetings are free of charge and do not commit you in any way. The dates of these events, along with a contact form for arranging personal meeting can be found at www.ahb.bfh.ch.

Head of course

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Courses at the Bern University of Applied Sciences Architecture, Wood and Civil Engineering

Bachelor

- of Arts in Architecture
- of Science in Civil Engineering
- of Science in Wood Engineering

Master

- of Arts in Architecture (collaboration with the Fachhochschule Westschweiz HES-SO)
- of Engineering in Wood Technology (collaboration with University of Rosenheim D)
- of Science in Engineering (collaboration with Swiss University of Applied Sciences)

Master of Advanced Studies

- MAS Preservation and Conversion
- MAS Timber Construction
- MAS Sustainable Construction

Certificates of Advanced Studies (CAS)

Courses at the Higher Technical Schools HF Wood Biel

Advanced technical courses

- Technical specialist Diploma HF in Timber Construction
- Technical specialist Diploma HF in Woodworking Industry
- Technical specialist Diploma HF in Lumber Industry
- Postgraduate HF in Management Studies

Professional and advanced technical certificate courses

- Timber Construction Supervisor
- Timber Construction Senior Supervisor (Site supervisor with Swiss specialist certificate)
- Swiss Master's certificate in Timber Construction
- Wood specialist with Swiss specialist certificate

Research and Development Services

- Practice-oriented Research and Development in all divisions
- Contract services
- Accredited testing: All our laboratories are certificated to ISO/IEC 17025 standard and have SAS (Schweizerische Akkreditierungsstelle) accreditation. The tests are recognised internationally.
- Knowledge and Technology Transfer (WTT – KTT)

Our university employs a certified quality management system that follows European Foundation for Quality Management Systems (EFQM) guidelines.

ACQUIN Accreditation, Certification
and Quality Assurance Institute

www.ahb.bfh.ch