

Bachelor of Science in Wood Engineering – studying from a different perspective

Bern University of Applied Sciences
Architecture, Wood and Civil Engineering



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Using renewable raw materials is more popular than ever. Wood, a home-grown raw material, is becoming increasingly important in both social and political terms. As raw materials become less abundant globally, forests and timber face important challenges. Our course is designed to prepare you for a wide range of professional profiles. We cover subjects from raw materials to semi-finished products, through load-bearing structures and on to furniture making and energy efficient housing. We provide skills in processing and manufacturing technologies, structural engineering, surface treatment technologies, construction physics, business administration, product development as well as energy and environmental technologies.

Timber structures, houses, interior furnishings and fittings, furniture: They can all be made from wood – a renewable natural resource, a multipurpose material suitable for a wide variety of processes and applications. Our Bachelor of Science in Wood Engineering division trains tomorrow's top wood engineers. It is the only applied science university qualification in wood engineering in Switzerland. ●

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Professional profile

Graduates of the Bachelor of Science in Wood Engineering course are engineers who design and develop living spaces and furniture made from wood. They have theoretical and practical skills in the manufacture of semi-finished and finished products. You will find wood engineers in sawmills, wood processing plants, carpentries, cabinet makers' workshops, furniture factories and in engineering offices. The course is unique in Switzerland and is based closely on the requirements and needs of the wood industry and related sectors. With their specialist knowledge and good communications skills our wood engineering graduates are in great demand world-wide.

Attractive career opportunities. Wood engineers who take up management positions in industry are responsible for developing intelligent products made from wood and wood composite materials. Your job as a wood engineer is to find solutions. You will be working on timber constructions, planning wood manufacturing processes and developing functional, cost-effective products. The broad range of skills and knowledge covered on the course will prepare you for a wide range of career paths. You will be able to take up managerial positions in medium-sized to large industries in the wood industry or in related sectors such as machine tools, building chemicals and adhesives. Wood engineers also hold executive positions in small to medium-sized businesses. They work in R&D and testing authorities. You could take up a position in an engineering office, work for private or public authorities or join the teaching profession. Your talents, skills and specialist knowledge can also be put to good use in the field of overseas cooperation and development. ●



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Practice oriented course

The syllabus of the Bachelor of Science in Wood Engineering course at Biel covers all the processes and applications involving the use of wood and wood-composite materials. All our teaching staff have a vocational training background and experience in research ensuring theory and practice are closely interwoven on our courses. Workshops, study trips, practical laboratory work, semester papers, projects organised in collaboration with the R&D department and our industrial partners are all designed to ensure that your studies remain firmly rooted in the real world.

Broad range of practical studies. The course concept covers timber building construction, interior furnishing, the building envelope, wood engineering, processing and manufacturing technologies, product development and business management. We think that an in-depth knowledge of wood as a renewable resource and working material is of primary importance. That's why the course includes modules on wood biology, technical applications and projects on process and product management.

Modules and ECTS

The bachelor degree is a professional qualification and the first level of the multi-tier course system. The course is assessed according to the European Credit Transfer System (ECTS) and is worth a minimum of 180 credits. The period of practical training is worth a further 30 credits. Courses are divided into learning modules. A module includes one or more courses. Each module is assigned a certain number of credits. Approximately 40 % of the modules are taught, i.e. periods of study supervised by teachers. The remaining modules are taught and self-study types. Successfully completing an academic year entitles you to a minimum of 60 credits.

Graduation

Each semester finishes with the module exams. Your studies finish with the presentation of your bachelor thesis. The Bachelor of Science in Wood Engineering course gives graduates a head start in their chosen profession. This bachelor degree is internationally approved. ●



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Finding your way

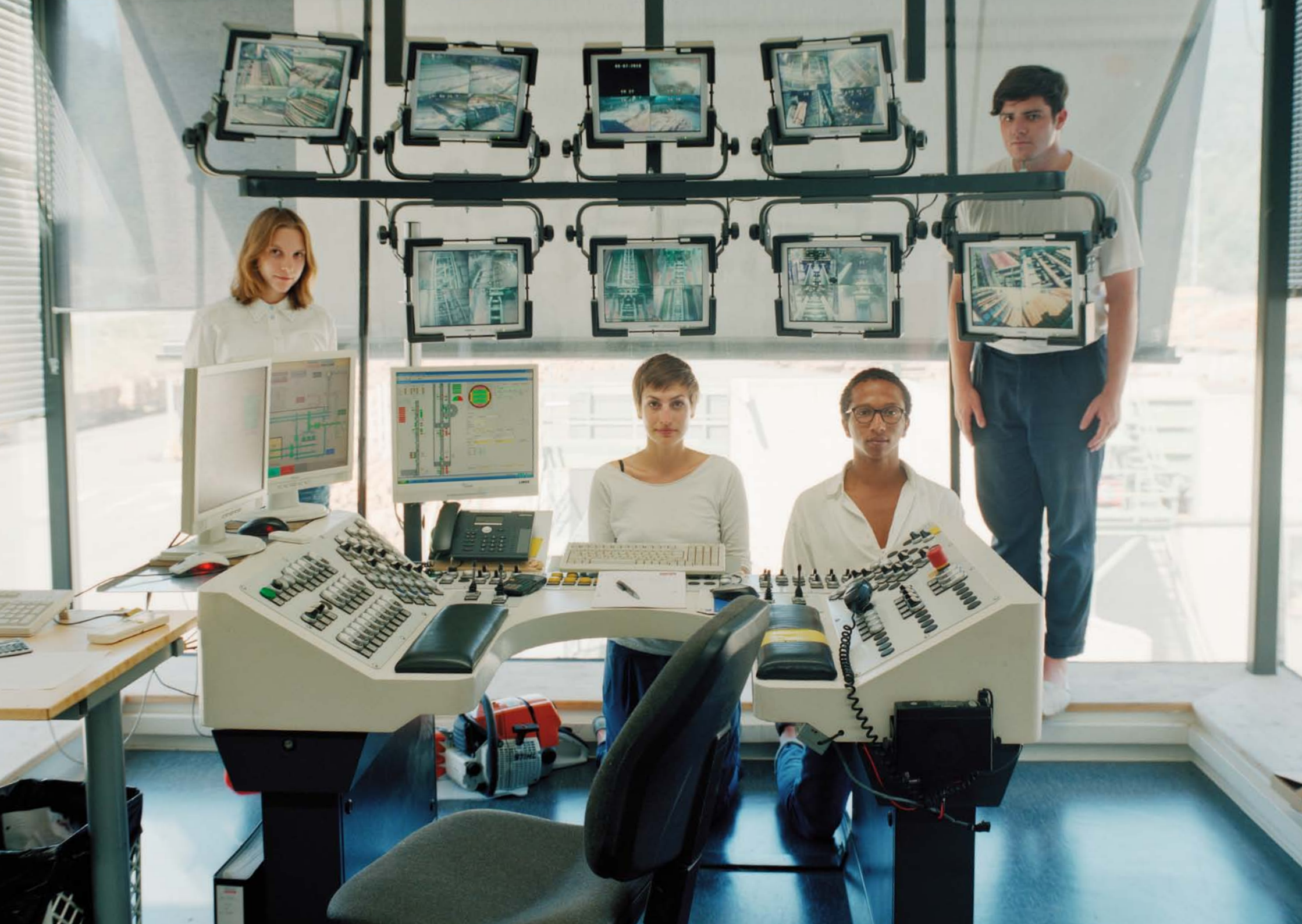
The course is modular in design and consists of taught and self-study modules. There are three types of module: mandatory, optional and elective modules. German is the main teaching language. Some study units will also be held in French or English. The course is full-time. In some cases part-time study is possible. You can find out more about this from the academic administration offices.

First year. In your first year you will be polishing your communications skills and technical knowledge. There will be modules on the natural and material sciences. You will also be learning about the legal and economic framework of Swiss society. Towards the end of the first year you will choose the specialisation, one of the two available, that you want to study in-depth in the second and third year.

Second year. In the second year you will start the modules for the two majors: Timber Structures and Technology (TST), Process and Product Management (PPM). The specialist option of the chosen field of studies will account for approximately 25% of your study time during this year. The other modules in this year will provide you with background and specialist knowledge about business studies, wood engineering, construction engineering, logistics, measurement and process control technology, energy management and building physics. In the third semester there are courses in mathematics, structural static analysis and information technology. In the fourth semester you will start project work with a semester paper. Your tutors will guide you through the work and this will be your first chance to gain experience with our industry partners. You will present this technical paper at the end of the semester.

Third year. In your third year, you may choose from six fields of study – process management, product management, interior furnishing, the building envelope, timber house construction and timber engineering and construction – in addition to the two majors, Timber Structures and Technology (TST) and Process and Product Management (PPM). These fields of study make up around 25 per cent of the third year of the course. Project work continues in the fifth semester and you will be preparing your bachelor thesis for presentation in the sixth semester; you may decide to carry on your thesis work into the practical training period. In the sixth semester you'll be putting the final touches to your studies with broad-ranging work in an interdisciplinary project.

Practical training. After the fifth semester you can opt for a period of practical training in a wood industry company or in a wood research institute at home or abroad. During this period your practical work will be supervised by departmental teaching staff. This will be your first experience as a practicing wood engineer and at the end of training you will complete your bachelor thesis. Practical training will extend your professional skills. Training abroad has the additional advantage that you will be able to improve your language skills or even learn a new language. This will also be an opportunity to get to know another country, its people and its culture. Practical training is a supplementary module. It will smooth the way for your entry into professional practice when you graduate. Periods of practical work can also be taken into account if you decide to study for a master's or PhD qualification at a later date in one of our partner universities in Switzerland or abroad. ●



Majors

At the end of the first year, you will choose between two majors:

Timber Structures and Technology (TST) emphasises the fields of statics, calculation and dimensioning, as well as construction and execution. You will have a command of the fundamental concepts and the characteristics specific to wood in the construction of complex buildings and supporting structures. You will apply Swiss and European norms professionally. You will develop buildings that make a statement.

In **Process and Product Management (PPM)** you will concentrate on processes for using wood for intelligent and environmentally friendly products. You will be covering stimulating areas such as processing and machine technologies, operational planning, business management, product development and marketing.

Minors

In your third year, you will acquire more extensive knowledge; to this end, you choose one minor out of a total of six:

Process management (only open to those taking PPM as a major). You will learn to develop and apply complex and economical finishing processes in the modules on production, operating efficiency, flexible finishing cells and reverse engineering.

Product management (open to both majors). As part of the modules on product development, design techniques and visualisation you will move between and coordinate design, production and sales. You will develop new products until they are ready to be brought to the market.

Interior furnishing (open to both majors). Using what you have learned in the modules on design, construction, interior architecture and planning, you will be in a position to work with architects and designers in planning and implementing custom-designed interiors.

Building envelope (open to both majors). In the modules covering the building envelope, architecture, window and façade technology, and house and building technology, you will learn the energy-efficient techniques and methods that are required for renovations and new construction.

Timber house construction (open to both majors). In the modules on building physics, building processes, timber house construction and architecture, the focus is on ensuring quality and durability, while paying attention to the demands of efficiency and the environment.

Timber engineering and construction (only open to those taking TST as a major). You will obtain the qualifications you need to develop and build traditional and futuristic supporting structures with what you learn in the modules on foundations and modelling, construction and processes, timber construction and stability, and composite construction and statics.

In each semester, you will attend at least two modules per minor. Two modules are pre-defined for the fields of process management and timber engineering and construction respectively. For the other four fields of study, the second module may be chosen freely from a total of eight. You may also choose additional modules, especially if you have already completed your bachelor's thesis during your practical experience period. Five more modules are available for you to choose from in the sixth semester. All the modules for the fields of study are given under www.ahb.bfh.ch. ●



Module concept for the Bachelor of Science in Wood Engineering. Without traineeship 180 credits, with traineeship 210 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
1st semester	Communication and Society (7) Languages (German, French, English; optional: Spanish), Law							Logic and Forces (8) Mathematics, Structural analysis							Materials, Processes and Components (6) Science of materials, Chemistry, Wood anatomy						Technics and Physics (5) Machining, Tools, Chipping gauge, measurement and process control technology					Computer science (3)			AHB-Specials* (1)	
2nd semester	Communication and Society (7) Languages (German, French, English; optional: Spanish), Macroeconomics, Wood economics <u>Intermodular week</u>							Logic and Forces (8) Mathematics, Structural analysis, Constructional design (carpentry), Timber house construction							Materials, Processes and Components (5) Science of materials, Chemistry, Timber macroscopy, Wood drying, Wood protection <u>Intermodular week</u>						Technics and Physics (7) Physics, Sawmill technology <u>Intermodular week</u>					Computer science (2)			AHB-Specials* (1)	
3rd semester	Communication and Society (4) Building and housing culture, Visualization				Logic and Forces (6) Mathematics, Structural analysis				Material, Processes and Components (4) Science of materials, Adhesive techniques				Technics and Physics (5) Building physics, Logistics, Wood-processing machines				Computer science (1)	Management (5) Business organisation, Business administration, Marketing				Major PPM (4) Commodity classification, Surfacing techniques, CAD			Major TST (4) Timber engineering and construction, CAD	AHB-Specials* (1)				
4th semester	Material, Processes and Components (6) Science of materials, Energy management, Building envelope					Technics and Physics (4) Building physics, Timber machining tools					Management (6) Costing, Business administration, Finance, Organizational structure, Project management					Interdisciplinary semester project (3)			Major PPM (5) Basic CAD-CAM, Quality and Process management, Measurement and Process control technology				Major TST (5) Computer statics, Structural analysis, Timber engineering and construction	Major PPM (5) Marketing, Surfacing technology			Major TST (5) Timber house construction, CAD, Measurement	AHB-Specials* (1)		
5th semester	Project work (5)				Ecology and Environment (2)		Major PPM (5) Manufacturing concept, Lean production, PPS				Major PPM (6) Equipment planning, Procurement, Materials logistic				Major PPM (4) Dimensioning, Product development				Minor in Process management (4)		Minor in Process management (4)									
							Major TST (5) Fire prevention in timber construction, Multi-storey timber construction				Major TST (6) Oscillation and building structure dynamics, Concrete construction, Steel construction				Major TST (4) Timber engineering and construction				Minor in Product management (4)		Minor in Product management (4)									
															Minor in Interior furnishing (4)				Minor in Interior furnishing (4)											
															Minor in Building envelope (4)				Minor in Building envelope (4)											
															Minor in Timber house construction (4)				Minor in Timber house construction (4)											
															Minor in Timber engineering and construction (4)				Minor in Timber engineering and construction (4)											
Practical training	The course administration recommends an internship (optional, 30) in a Swiss or foreign company for a period of nine months at the least. Usually the bachelor thesis is developed during the practical training.																													
6th semester	Projects (5) Interdisciplinary project, Project week				Major PPM (5) Business policy, Controlling, Finance, Logistics				Minor in Process management (4)				Minor in Process management (4)				Bachelor thesis (12) If not achieved during the traineeship.													
									Minor in Product management (4)				Minor in Product management (4)																	
									Minor in Interior furnishing (4)				Minor in Interior furnishing (4)																	
					Major TST (5) Steel, Concrete, Timber engineering and construction				Minor in Building envelope (4)				Minor in Building envelope (4)				Elective modules Should the bachelor thesis have been developed during the practical training, the student may deepen his or her knowledge in further areas of expertise. The module plan is available online at www.ahb.bfh.ch .													
									Minor in Timber house construction (4)				Minor in Timber house construction (4)																	
									Minor in Timber engineering and construction (4)				Minor in Timber engineering and construction (4)																	

The next step: Master of Engineering Wood Technology

Bern University of Applied Sciences Architecture, Wood and Civil Engineering and the University of Applied Sciences Rosenheim (Germany) offer jointly an international master course in wood technology. This course allows you to expand your development potential by acquiring factually based competencies in management, methodology and social issues, as well as to enlarge your skills and knowledge in one of eight possible Master Research Units (MRUs):

- Building Physics and Building Services Engineering
- Dry Construction, Lightweight Construction and Finishing
- Furniture Design and Furniture Testing
- Management
- Materials and Wood Technology
- Production and Logistics
- Timber and Composite Construction
- Windows, Facades, Winter Gardens, Doors and Gates

The course is modular in structure and takes three semesters of full-time study. They focus on expanding competencies in relation to the newest wood industry technologies, as well as involvement in research and industrial projects. If you are interested in finding out more, please order the special guide on this subject.

Courses and seminars

Flexibility and life-long learning are in greater demand than ever in today's working environment. We offer a multi-faceted programme of courses, conferences and seminars; at these, speakers from our institution and elsewhere present and discuss the newest findings and experience. Lecturers from our specialised areas, and colleagues from our research and development division, hold regular events. All our events can be found in greater detail under www.ahb.bfh.ch, under "Continuing Education" or "Events". ●



Course start date

Calendar week 38.

Course duration

Full time: Six semesters. For the practical training you should allow 9 months.

Semester fees

CHF 600.– Tuition fees

CHF 90.– Flat rate charge for lecture notes and handouts

CHF 80.– Examination fees

CHF 24.– Fee for social, cultural and sports infrastructure and events

CHF 15.– Membership charge for the VSBFH students' association

The registration and matriculation fee comes to CHF 100.–. An average of CHF 400.– must be budgeted per semester for copies, books and excursions. For study grants and loans please contact your canton tax authority in Switzerland.

Course entry requirements

- Completed vocational training in the wood industry, with a federal vocational-training higher national certificate or higher secondary school certificate
- Higher secondary school certificate with an internship in the timber industry. Bern University of Applied Sciences offers students holding the higher secondary school certificate the "Passerelle", a preparatory programme for technical UAS courses. You can obtain more information from the course administration or from the Internet at www.passerelle.bfh.ch.
- Wood-related education at a higher technical college

Admission for applicants with a different educational background is at the discretion of the course administrators.

Course guidance and information

A course guide brochure won't necessarily answer all your questions. That's why we organise a calendar of events where we can present our courses and answer your questions. Or we can answer any questions you may have in a face to face meeting. We will be happy to answer your queries and help you choose the course that suits you best. To download the timetable of our info events, go to our home page at www.ahb.bfh.ch and please make an appointment for a personal meeting directly with the course administrator.

Academic management

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The Bern University of Applied Sciences Architecture, Wood and Civil Engineering offers the following degree courses

Bachelor

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

Master

- of Arts in Architecture (coop. with the University of Applied Sciences of Western Switzerland)
- of Engineering in Wood Technology (coop. with the University of Applied Sciences of Rosenheim, Germany)
- of Science in Engineering (coop. with Switzerland's Universities of Applied Sciences)

Master of Advanced Studies

- MAS Timber Construction
- MAS Preservation of historical Buildings, Restoration and Conversion
- MAS in sustainable Construction
- MAS Energy Engineer Buildings

Diplomas of Advanced Studies (DAS)

Certificate of Advanced Studies (CAS)

The affiliated Technical College HF for Wood in Biel offers the following courses

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 Course HF in Business Management

Professional and higher Specialist examinations

- Timber Construction Supervisor with diploma
- Timber Construction Senior Supervisor, Site supervisor with Federal Technical Qualification
- Timber Construction Master with Swiss specialist diploma
- Wood specialist with Federal Technical Qualification

The range of services offered by Research and Development (R+D) covers

- Application-oriented R+D in every area of study
- Contract Services
- Accredited testing: Each laboratory is accredited by the Swiss Accreditation Service (SAS) in accordance with ISO/IEC 17025. The tests are internationally recognised.
- Knowledge and technology transfer

Our courses of studies have been accredited by ACQUIN and comply with the European standards of the «European Foundation for Quality Management» (EFQM).

ACQUIN Akkreditierungs-, Zertifizierungs- und Qualitätssicherungs-Institut

www.ahb.bfh.ch