Master of Science in Wood Technology
“Wood is a monosyllabic word, but it reveals a world of fairy tales and wonders.”

Theodor Heuss (German politician, 1884 – 1963)
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16 The fields of study of the wood and construction industries united under one roof
Technological progress, globalisation and digital networking open up new possibilities in the timber and construction industry. The wood sector needs highly skilled and qualified specialists as well as managers to meet these challenges. The Master of Science in Wood Technology, developed by Bern University of Applied Sciences BFH in close cooperation with leading Swiss enterprises of the wood industry, provides you with a profile that is both innovative and geared towards practical application.

**Aims of the Programme and Skills Developed**

As a graduate of the Master programme, you will be equipped with a profound knowledge of the future issues in the wood sector. You will have the skills and competence to solve challenging tasks in timber construction, in the woodworking or wood processing industries or in the supply industry.

In today’s competitive and global economy, this education helps you acquire the skills to make rapid and profitable decisions. Your highly developed methodological and social skills as well as your advance knowledge of management prepare you for executive positions. The programme enables you to work in timber engineering and all positions along the wood value chain in technical, managerial, or ecologically critical roles. You will be able to understand, initiate and forge interactions with related disciplines as well as to coordinate and perform research and development in sector-relevant fields. Possible activities for graduates include leadership positions in management and production, project management, consulting, engineering, quality control, as well as research and development.
Admission Requirements
- Bachelor degree in Wood Technology or equivalent
- Typically, above average final marks are required
- Evidence of 210 credits (if proof of 180–210 credits is provided, the missing credits can be earned during the master programme)
- Proof of English competence
The programme has a modular structure and comprises three semesters for full-time students, and four to six semesters if completed part-time. It consists of core modules and two comprehensive projects with a case study for each of the specialisations and concludes with the Master’s thesis. Via core modules and projects, you gain in-depth technical knowledge and management skills as well as methodology and social competence. You are taught by experienced lecturers and external professionals from leading companies in the timber industry as well as from engineering firms.

Core Modules
The core modules comprise compulsory and elective subjects. The core modules deal with crucial topics and teach contents that serves as the basis for the projects relevant to the specialisations. Furthermore, you acquire additional professional and methodological skills through elective modules. In this way, you tailor your studies to your preferences and inclinations. Thus, in addition to the necessary technical expertise, you will master the modern management methods and professional communication skills that are expected of today’s graduates of a Master programme.

Projects
Apart from the core modules, in the specialisations Management of Processes and Innovation (MPI) or Complex Timber Structures (CTS) the focus is on developing an individual profile. Each specialisation offers two comprehensive projects, which consist of two thematically coordinated Input Modules and an application-oriented Case Study. The projects must be completed as a unit. They will prepare you thoroughly to handle complex tasks in your professional future.


Master’s Thesis
The Master’s thesis allows a specialisation according to personal interests. Students deal with a topic of practical relevance at a high scientific level. The thesis is embedded in a current project with a business partner or an ongoing research project at Bern University of Applied Sciences BFH. It can thus serve as a springboard into professional life or as a starting point for a career in science.

Research and Development
The Master programme is closely associated with research and development (R&D) at BFH. Over 120 committed employees in R&D create ideal conditions for a progressive technical and scientific education. Three institutes house the research activities of particular relevance to the programme. These institutes have close links to the industry and serve as the interface to teaching and continuing education. Furthermore, there are strong links to the BFH Centre for Wood that addresses wood as a resource and building material over the entire value chain, as well as to the Centre for Development and Cooperation that specialises in activities in emerging and developing countries.

- Institute for Materials and Wood Technology
- Institute for Timber Construction, Structures and Architecture
- Institute for Digital Economy in the Construction and Wood Industries
- BFH Centre for Wood – Resource and Material
- Centre for Development and Cooperation
**Study Models**

You can combine the Master programme with an internship or with part-time employment. These two options are especially applicable if the student lacks practical experience in his or her educational background or if the prior Bachelor studies were completed with fewer than 210 credits. The lectures and events take place Monday/Tuesday and Thursday/Friday respectively, thus allowing for combination with part-time employment in a company or as an assistant at Bern University of Applied Sciences BFH. Currently the programme is only offered part-time.

### Different Study Models

<table>
<thead>
<tr>
<th>Semester</th>
<th>Part-time studies in 4 semester</th>
<th>Part-time studies in 5 semester</th>
<th>Part-time studies in combination with an internship</th>
<th>Part-time studies in combination with employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>lectures</td>
<td>Master's Thesis</td>
<td>Internship and Master's Thesis</td>
<td>Employment and Master's Thesis</td>
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<tr>
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</table>

- **Lecture**
- **freely available**

70% of students benefit from the modular structure and combine their studies with employment in industry or in research at Bern University of Applied Sciences.
Specialisation: Management of Processes and Innovation (MPI)

In view of ever more demanding customer requirements and mounting competition, innovation is key to success in the wood sector and its setting. Projects are becoming increasingly complex and more international. New approaches from information technology such as Industry 4.0 disrupt sector structures and alter the business landscape. Customers and partners are integrated directly into value chains. This is where the MPI specialisation comes in. You acquire the professional skills to develop and manage business models and to introduce innovative technologies and new products.

At the centre of this specialisation, there are two semester-long projects, each consisting of a Case Study and thematically coordinated Input Modules. In the first Case Study, Digital Manufacturing in the Wood Industry, you will design a smart factory – a model factory with fully automated product lines – with a consistently digital information system. You will then realise the smart factory in our Technology Park. At the same time, you will be taught the basics of information management as well as planning and designing organisational, logistic and financial processes. In the second Case Study, Innovation Management, you will use an idea as a starting point for an innovation project which you will develop up to market launch. Here you will learn how companies nurture a culture of innovation, how they develop and implement innovation strategies and structures. During the Case Study, you will create a business case and communicate this to a potential investor.

The MPI specialisation revolves around product development, materials engineering, process optimisation, automation and market analysis.
It has become ever more complex to develop and build modern timber structures. The requirements upon timber engineers have increased accordingly. In the CTS specialisation, you will acquire the capability to plan and construct complex free-form and shell structures and multi-storey buildings in timber. Among the main topics covered in the specialisation are cutting-edge techniques for modelling new and existing structures, simulation and data management processes such as Building Information Modelling BIM, seismic calculations, and challenges relating to building physics and normative parameters.

At the centre of this specialisation, there are two semester-long projects, each consisting of a Case Study and thematically coordinated Input Modules. In the first project, Modelling of Complex Timber Structures, you will analyse free forms and shell structures. The focus is on modelling, statically analysing and calculating complex bearing structures and details, and on their practical implementation. In interdisciplinary work, you will optimise designs for manufacturing and assembly. In the framework of the second project, Multi-Storey Timber and Hybrid Structures, you will examine the load bearing behaviour of multi-storey wood structures and you will design, model and calculate earthquake-resistant timber structures. You will apply and implement the current structural standards for seismic action. In addition, you will learn to critically assess the results of seismic calculations. You will develop concepts for multi-storey timber buildings in interdisciplinary teams. You will also take into consideration the boundary conditions regarding construction progression.

Progressive procedures for modelling, simulation and data management are key aspects of the specialisation.
processes, planning and cost security (Building Information Modelling BIM). Furthermore, you will apply procedures for assessing and strengthening existing buildings, address aspects of building physics and fire safety and solve specific questions of interrelated planning and construction process management.

The large testing rig for wood structures and the CNC machine in the BFH Technology Park in Biel.
Module Schedule, Part-time studies

<table>
<thead>
<tr>
<th>Semester</th>
<th>Credits</th>
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<tbody>
<tr>
<td>1 and 3 Autumn</td>
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<tr>
<td>1</td>
<td>2</td>
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<tr>
<td><strong>Wood-Based Panels – Theory and Laboratory</strong></td>
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<tr>
<td>mandatory for MPI</td>
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<tr>
<td>Markets, production technology, adhesives, material emissions, simulation</td>
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<tr>
<td><strong>Finite Element Modelling</strong></td>
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<tr>
<td>mandatory for CTS</td>
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<tr>
<td>Plate theory, second order calculation, limit state analysis, advanced mathematics</td>
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<tr>
<td><strong>Leadership and Communication</strong></td>
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<tr>
<td>Leadership, personal development, self-management, international project management</td>
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<tr>
<td><strong>Elective</strong></td>
<td></td>
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<tr>
<td>Modelling Software for CTS (a variety of courses), BIM, Advanced Wood Processing for MPI (2–6 credits), modules of the Master of Science in Engineering, continuing education courses offered by the BFH, language (up to 5 credits), term paper (3–10 credits), excursion (2 credits), others</td>
<td></td>
</tr>
<tr>
<td><strong>Project 1 MPI: Digital Manufacturing in the Wood Industry</strong></td>
<td></td>
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<tr>
<td><strong>Information Management</strong></td>
<td></td>
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<tr>
<td>Data management, data bases, web technology, data security, Industry 4.0</td>
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<tr>
<td><strong>Case Study</strong></td>
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<tr>
<td><strong>Processes and Controlling</strong></td>
<td></td>
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<tr>
<td>Process management, simulation, economic efficiency, controlling</td>
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<tr>
<td><strong>Project 1 CTS: Modelling of Complex Timber Structures</strong></td>
<td></td>
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<tr>
<td><strong>Data Management for Timber Engineers</strong></td>
<td></td>
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<tr>
<td><strong>Case Study</strong></td>
<td></td>
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<tr>
<td><strong>Free Form and Shell Structures</strong></td>
<td></td>
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<tr>
<td>Load carrying behaviour, geometry and digitalisation, modelling, connections</td>
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<tr>
<td><strong>Master’s Thesis</strong></td>
<td></td>
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<tr>
<td>30 credits</td>
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</tbody>
</table>

- **Core Modules mandatory**
- **Core Modules elective**
- **Specialisation Management of Processes and Innovation MPI**
- **Specialisation Complex Timber Structures CTS**
- **Master’s Thesis**
<table>
<thead>
<tr>
<th>Fiber-Reinforced Composites</th>
<th>Scientific Methods</th>
<th>Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio-based hybrid materials, bionics, material characterization</td>
<td>Scientific methodologies, statistics, global environmental management</td>
<td>as on the left side</td>
</tr>
</tbody>
</table>

### Project 2 MPI: Innovation Management

<table>
<thead>
<tr>
<th>Innovation Strategy</th>
<th>Case Study</th>
<th>Finance and Legal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of innovation processes, innovation management tools, new product development</td>
<td>Financial management, taxes, intellectual property</td>
<td></td>
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</tbody>
</table>

### Project 2 CTS: Multi-Storey Timber and Hybrid Structures

<table>
<thead>
<tr>
<th>Assessment and Retrofitting</th>
<th>Case Study</th>
<th>Earthquake and Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods for assessment, maintenance and strengthening, remodeling, densification</td>
<td>Concepts for multi-storey timber buildings, structural dynamics, earthquake design</td>
<td></td>
</tr>
</tbody>
</table>
### Studying Abroad

The Bologna process fosters international exchange while studying. At the BFH we attach great importance to close international networking and seek to promote the mobility of our students. We invite you to make the most of the opportunities we provide and profit from our network of partner universities around the world. French-speaking students can apply for a dual diploma with the École Supérieure du Bois (ESB) in Nantes, France. You can find more information at www.ahb.bfh.ch/international.

### Certificate of Global Competence

With BFH's supplementary “Certificate of Global Competence”, you as a student have the opportunity to acquire specific intercultural and transcultural skills during the course of your studies and to earn a qualification for them. You can find more information at www.ahb.bfh.ch/international.

### Infrastructure

- The university has an open-access library with reading rooms. The library documents are linked to NEBIS, the network of libraries and information centres in Switzerland.
- Students may use the facilities at all hours.
- Students have access to an intranet. Each student is allocated a personal e-mail address.

<table>
<thead>
<tr>
<th>Annual Schedule in Calendar Weeks</th>
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<tbody>
<tr>
<td><strong>Autumn semester</strong></td>
</tr>
<tr>
<td>38 – 51</td>
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<tr>
<td>52 – 1</td>
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<tr>
<td>2 – 4</td>
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<tr>
<td>5 – 6 7</td>
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<tr>
<td><strong>Spring semester</strong></td>
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<tr>
<td>8 – 24</td>
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<tr>
<td>25 26 – 37</td>
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</tbody>
</table>

- Lectures
- Lecture-free period (partly: Block Weeks, Projects)
- Exams
The region of the Lake of Biel and the vicinity to the Swiss Alps offer attractive conditions for a multitude of activities.

- Parking spaces are available for a fee. Windscreen stickers are available. However, we recommend using public transportation.
- In Biel we operate the largest research centre for the Swiss wood industry; in Burgdorf we run a laboratory for geotechnics together with the Institute for Geology at the University of Bern. Most tests are certified according to ISO/IEC 17025 by the Swiss Accreditation Service (SAS). The tests are internationally recognised.

Accommodation and Catering
The university cafeteria at the Biel campus offers inexpensive meals from Monday to Friday. We assist our students in finding accommodation. For more information, go to our website.

Leisure: Sport and Culture
The BFH offers a broad range of leisure activities, with training in numerous types of sports and various cultural courses. The choices are varied and attractive, ranging from badminton or power yoga to drawing or singing in a choir. “The Games”, our traditional sports day, takes place every year in early summer at the Federal Institute for Sports in Magglingen. You can find more information at www.bfh.ch.
After Graduation

Doctoral Degree
Holders of a master’s degree with an excellent academic record may, write a doctoral thesis at Bern University of Applied Sciences in collaboration with an academic university. It is this university who decides admission. Candidates can thus benefit from our practice-oriented infrastructure and labs, and our profound specialist knowledge. We can help you find the appropriate partner academic university and research topics.

Continuing education
The range of continuing education courses offered by Bern University of Applied Science in the disciplines of architecture, wood and civil engineering supports life-long learning and helps you keep fully up-to-date professionally. The courses teach the latest innovative and professionally relevant subject matter through intensive dialogue with teachers and researchers, as well as with expert professionals with a wealth of practical experience. Our offerings include further education study programmes (MAS and CAS), specialist conferences and other courses. They are geared to your career needs, your individual situation and your company’s requirements. Look under Continuing Education on www.ahb.bfh.ch to find the full range of our programme.
Programme Starting Date
Autumn: calendar week 38

Programme Duration
Full-time: 3 semesters (not offered at the moment)
Part-time: 4 to 6 semesters

Study Place
Biel, Switzerland

Programme Language
English. Upon approval, the term paper and thesis may alternatively be written in German or French.

Programme Fees
- Tuition CHF 750.–
  - For international students CHF 950.–
- Materials fee CHF 50.–
- Examination fee CHF 80.–
- Fee for social, cultural, and sports activities CHF 24.–
- Voluntary BUAS student association membership CHF 15.–

The registration fee of CHF 100.– is one-off and is non-refundable even if the application is rejected.

Application Procedure
Applications must be submitted at www.ahb.bfh.ch/wood/master. All documents that are not written in German, French, or English require an official translation. A complete list of required documents can be found on our website. As soon as all documents are submitted and the registration fee has been paid, the application will be forwarded to the department for review. The applicant can review the status of their application online at all times.

Head of Programme
Dr. Ingo Mayer, ingo.mayer@bfh.ch

Programme Coordinator
Christa Gertiser, christa.gertiser@bfh.ch
The fields of study of the wood and construction industries united under one roof

Courses offered by 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 Architectur (in cooperation with the University of Applied Sciences of Western Switzerland)
- of Science in Wood Technology (in cooperation with the Rosenheim Technical University of Applied Sciences, Germany)
- of Science in Engineering (in cooperation with the other Swiss Universities of Applied Sciences)

Master of Advanced Studies
- MAS Timber Construction
- MAS Preservation of historical Buildings, Restoration and Conversion
- MAS in sustainable Construction
- MAS Real Estate Management MAS Timber Construction

Certificates of Advanced Studies (CAS)

The affiliated Higher Technical School of Wood Biel offers the following courses
- Technical Specialist Diploma HS Wood Technics with diploma in Timber Construction, Woodworking Industry, or Lumber Industry
- Postgraduate course HS in management
- Timber construction foreman with diploma
- Timber construction foreman with federal professional certificate
- Wood specialist with federal professional certificate
- Master Craftsman in timber construction, specialist with federal diploma

The range of services offered by Research and Development covers
- Application-oriented research and development in all areas of study
- Contract services
- Accredited testing: Most expert reports are certified according to ISO/IEC 17025 by the Swiss Accreditation Service (SAS). The tests are internationally recognised.
- Knowledge and technology transfer