



Timber and Composite Construction

This Master Research Unit (MRU) is part of the Timber and Composite Construction research unit at Bern University of Applied Sciences Architecture, wood and civil engineering in Biel. In this research unit, a wide range of construction applications with wood are investigated and optimised. Due to the increasing demand for energy-efficient and sustainable building, as well as the consciousness that wood is the only renewable and sustainably producible material, more and more private and public builders are reverting to timber construction. They have confidence in timber construction, which meets all the technical, economic and ecological demands placed on it. This growth requires well-trained specialists who can take over the ambitious tasks of planning, developing and implementing.

The object of current research also includes the identification of new applications for wood. When wood is combined with other materials, the special properties of wood and the materials developed from it yield high-performance components with great potential for optimisation («Timber-Concrete Composite» project*).

The research unit is an internationally accredited research unit for timber construction. Superbly equipped laboratories provide the ideal conditions to handle genuine projects in a scientific manner.

Course contents

Your studies are individualised and relevant for practice. You choose your major according to your personal goals. In addition to material-specific design and developing exceptional constructions you will also learn to master ambitious planning projects. Combining wood with other high-performance materials can lead to surprising solutions. You will expand your knowledge of numerical and material-specific modelling tasks, which will be an advantage for you in planning complex building projects and with regard to load-bearing structures.

During the course you will handle timber and composite construction projects independently and will be able to participate in numerous R+D projects within the unit. Your research will be in the areas of materials development, joining technology («Glued Joints of Wood Components» project*), multi-storey timber construction and applied building physics («Sound-proofing in Timber Construction» and «Compact Facades in Wood» projects*). With its emphasis on practical projects, the subject area of building restoration with its fields of condition analysis, preservation, renovation and conversion («Inspection Methods of Existing Wood Constructions» project*) will prepare you for this important area of future construction work.

* Further information about the projects can be found in our project database under www.ahb.bfh.ch/pdb.





Within the Timber and Composite Construction MRU you will be able to develop your knowledge in one or several of the following skill sets:

Multi-storey Timber Construction

Today, improved and modified planning conditions make it easily possible to construct four-storey to six-storey buildings out of timber. Increased requirements on both the construction and verification (surveying) as well as the building physics and fireproofing must be met.

You will be introduced to the numerical modelling of components and supporting frameworks, taking the properties of wood as an anisotropic material into consideration. Possible combinations of wood with other materials require the development of necessary skills in the areas of both materials and joining technology.

As a specialist in Multi-storey Timber Construction you will use your abilities from the design stage up to surveying this ambitious type of building. You will be best equipped to demonstrate your talents in engineering firms and in any other area of manufacturing.

Applied Building Physics

Sustainable energy saving concepts are a hot topic in the building industry right now and will become a pivotal issue in the future. At the same time, demands for a high level of living comfort are rising. In addition to light and thermal cosiness, the need of quiet, and consequently soundproofing, are crucial factors. You will analyse building materials, components and damage to building structures, taking the various aspects of building physics into consideration. You will also develop innovative measures that can be used in the real world. Numeric methods will provide you with the basics for this work. A building physics laboratory with versatile measuring and test equipment offer the necessary technical support to test your models on a 1:1 scale.

As a specialist in Building Physics you will deal with the physical properties of wood and wood composite materials in their applications. Students master the classical fields of work in building physics and building ecology. Your work will be interdisciplinary in nature in cooperation with other building experts from the fields of architecture, civil engineering, building services and building biology.

Building Restoration

In the future, more construction work will be performed on existing building structures. In turn, building restoration and conversion will continue to grow in importance. In particular, increased requirements with regard to indoor climate and energy efficiency must be considered. A precise and informative analysis of the building condition together with a technically sound interpretation of the results form the basis of any restoration.

You will learn how to use approved methods and state-of-the-art technical tools to survey and evaluate existing structures systematically. You will become familiar with complex structural systems and the consequences of conversion. You will have the knowledge required for evaluating the forms of damage and damage profiles.

As a specialist in Building Restoration you will carry out project-specific analyses of building condition and suggest solutions for retrofitting existing structures. You will identify architectural, structural and historical qualities and develop innovative, practical solutions.

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