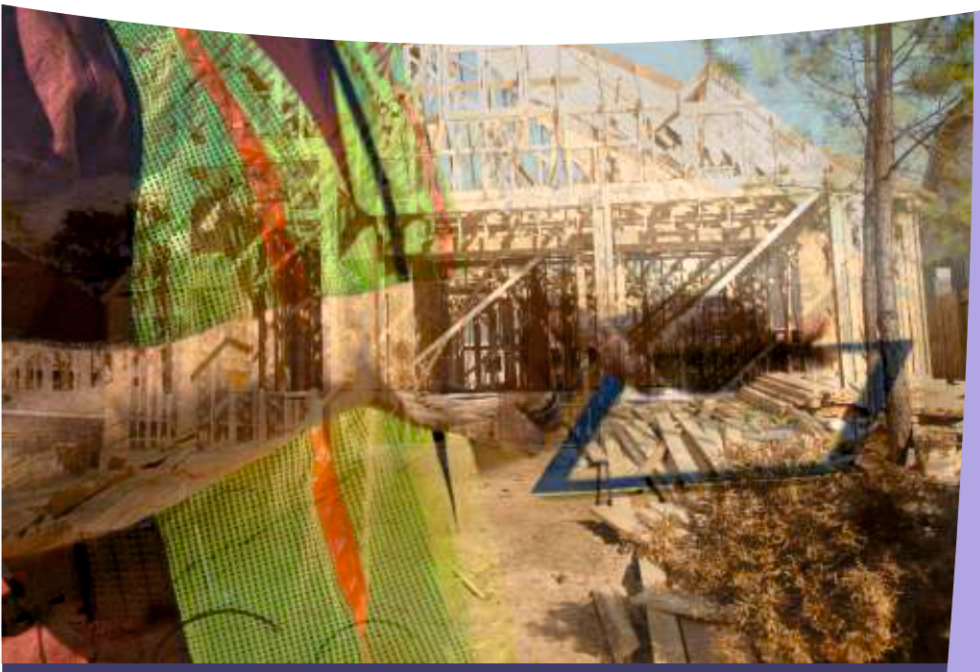
Fit For
BIM

BGZ



Training course on digital construction for vocational school teachers and trainers

Co-funded by the
Erasmus+ Programme
of the European Union

The learning units are the result of the FIT for BIM project within the framework of the Erasmus+ programme.

Projekt- Coordination

BGZ Berliner Gesellschaft
für internationale Zusammenarbeit mbH

www.bgz-berlin.de

www.fit4bim.eu

Information: Robert Peterseim, Berlin,.2019
pet@max-bill-schule.de

Berlin, 2020

Inhaltsverzeichnis

Attachment:
Presentation: Kubus project
BIM Workshop Revit 2019. Projekt Kubus (German)

Training Course on Digital Construction for VET-Teachers:

Basic Course Modeling, Modeling with the Method BIM

This module deals with modeling with BIM. There is a script available.

Bullet point	Comments / Example
1. Title	**Module 1: „Basic Course Modeling"**
2. Short description	The implementation of the BIM method requires skills, abilities and knowledge in dealing with BIM-capable programs such as Revit, Allplan or Tekla. In addition to the modeling of a building geometry (3D) with the help of component libraries, the focus is also on the targeted use of the component data generated during modeling (masses, areas, quantities). What is interesting and new about Building Information Modelling compared to conventional and traditional methods are the data (references/parameters) which do not have any geometry and therefore cannot be seen in the 3D view. The "Basic Modelling Course" module provides participants with basic knowledge of creating a data model using BIM-enabled software and enables teachers to develop the first simple BIM-enabled projects for training. Participants will also gain an insight into how BIM-enabled software can be methodically and didactically trained. In addition, the module concretizes the knowledge acquired in the "Introduction to the BIM Method" modules.
3. Target group Requirements of the participants	**Target group:** Teachers in a department of a vocational training centre, for example with a focus on construction engineering, wood technology, construction planning or system planning. **Prerequisites:** The teachers should already have experience and knowledge in dealing with CAD software and its implementation. Participation in the modules "Introduction to the BIM Method" and an extended module "In-depth BIM" would be recommended in advance, but not a mandatory prerequisite for the "Basic Modelling Course".
4. Duration of the module	Total 40 hours, 20 hours, 10 units 90 minutes and 20 hours of individual exercises for the consolidation of acquired knowledge and skills.
5. Assets to be acquired	The participants ...

and transferred **skills**	... create a project structure and generate a data model with referenced components. ... select smart parts from databases or import external parts/families. ... are able to modify existing components or objects or adapt them to the project task. ... export data models to an open interface (e.g. IFC). ... are able to develop small training modules and prepare them methodically/didactically. **Result of the module**: *At the end of the basic course, all participants* are able to create/develop their own simple BIM-capable projects (data models)* for training with the help of an appropriate software solution.
5. Organisation and structure of the **module,** **Speaker** **Proposal for a time schedule**	The basic module can be understood as software training for program beginners or advanced training for program users without modeling experience. The training is carried out either by a colleague from the training centre or by a lecturer from a planning office or a software training company. However, it would be advisable to have an in-house course management, since the orientation or focus, also with regard to didactic-methodological aspects, would be easier to communicate and implement. **Organisational form:** 5 appointments of 180 minutes each, alternative: 3 days of 5 units of 60 minutes each and individual work to deepen the acquired skills. • General introduction: Overview of the course contents and the training project, formulation of objectives, discussion of the course documents. (script, task, project documents) • 2,5 days → Introduction to the planning software (extent depends on the previous knowledge of the learning group) • →Differentiation between BIM software and conventional CAD programs → Guided modelling/ creation of the training project • At the end: Discussion of the training participants about relevant technical contents (commands, components, complexity of the building) for a basic project or for an

	extension if necessary. → Development of own first project ideas for the training (different levels or focal points, e.g. calculation or civil engineering)
6. Content	**BIM in construction planning:** Effect of the planning method on the planning software and its users. • What is the difference between CAD and BIM programs? • Basic information for the creation of a BIM project with regard to the structure (levels, floors, ...) → Minimum requirements for the production of an IFC • Dealing with libraries and databases→ Import of external components/families • What are intelligent components? • Use of intelligent components (database/libraries) in the context of modeling commands (wall, ceiling, window commands, etc.) • Modification of existing components/objects (adaptation of attributes and parameters) • Which data is generated and how can it be accessed? → Room, component and materials lists • Intelligent dimensioning and labeling of views and sections → Utilization of component information • Export of the entire data model via IFC interface • Compilation of plans • Export of plans via plot or PDF • How can a qualification or training of trainees and pupils take place? Learning script, work in small groups, digital communication via Moodle with the lecturers (review, collection of problem areas, ...), playful learning progress check (Quiz)
7. Certification, if foreseen	Not intended, certificate of participation is issued by the management of the educational center.

Training Course on Digital Construction for VET-Teachers

Strategyforteachertraining

Step 1

Survey for the BIM working groups

I. Formal learning, qualification measures
I.1. Courses; Which courses for the extension of the technical competence were offered at your institution and who participated?
I.2. In which conferences did colleagues participate?
I.3 Which courses for the learning of new programs (e.g. Revit)have been offered at your institution / have been organized by yourself?
I.4. Participation in courses of other providers – to which courses of advanced training of other providers, mostly the industry or large offices, did colleagues have been sent to?
I.5 What internships in innovative companies (Offices working with BIM, for example?) did your colleagues benefit from?
I.6. Exchange – are you in communication/ dialogue with modern, innovative offices/ companies?

I.7. Independent study – How and where did you acquire knowledge about the BIM and skills within BIM by yourself; literature, internet research among others?
II. Informal and experience based learning
II.1 Experimental learning, where and how did individual colleagues familiarize themselves with the new programs, did acquire knowledge and skills due to learning by doing?
II.2. "Stealing with the eyes and ears", where and how did you acquire knowledge and skills informally, did look over your colleagues' shoulder, overheard something during the coffee break?
II.3. Cooperation, are there any colleagues that worked in an office or company, secondarily work and acquire knowledge due to learning at the workplace? Where and how do you learn from such colleagues?
II.4 Teamwork, if there are team structures, you are working in a team, how and what are you learning in the team, in team meetings or from the mutual elaboration of learning contents, of curricula etc.?
Comments

Glossary

BIM- The term Building Information Modeling (BIM) describes a method of networked planning, execution and management of buildings and other structures using software. All relevant building data are digitally modelled, combined and recorded. The building is also geometrically visualized as a virtual model (computer model). Building Information Modeling is used in the building industry for construction planning and execution (architecture, engineering, building services, civil engineering, urban development, railway construction, road construction, hydraulic engineering, geotechnics) as well as in facility management.

The method is mainly concerned with processes. The BIM applications are mainly related to communication, coordination and teamwork. Software, hardware and cloud solutions are required for BIM implementation.

Open-BIM

With Open-BIM, dataisexchangedwith open informationmodels. An open information model is based on a disclosed schema. The most widely used schemas are those of buildingSMART (including IFC, BCF). With an Open-BIM approach, the software used should be able to import or export data according to the open information model agreed upon in the project. Software from different manufacturerscanbeused.

Closed-BIM

In Closed-BIM, data is exchanged and integrated according to a proprietary information model of a software manufacturer. A proprietary information model is based on a schema of the software vendor whose structure is not disclosed ("closed"). In a Closed-BIM approach, the software to be used should be tailored to several planning disciplines and the project team should be composed in such a way that as many planning disciplines as possible can work with this software.

BIM models: from 3D-4D to 5D-6D-7D

3D model - The term 3D is mainly used in the trigonometric calculation and production of spatial volume models (coordinates: length-width-height). In the following ones, additional dimensions are added (4D-hyperspace-hyperspace body simulation-rotation)

BuildingSMART International is an international non-governmental non-profit organization. It defines the Industry Foundation Classes (IFC) exchange format for BIM data exchange in the construction industry. https://www.buildingsmart.org

BIM software -

These include: Software for creating models, test programs, simulation programs and data exchange platforms for models

BIM guidelines and standards

In DE - VDI Guideline 2552 https://www.vdi.de/richtlinien/unsere-richtlinien-highlights/vdi-2552

Blended learning

Blended Learning is a combination of different methods and media, which integrates as a universal learning organisation all methodological, media-didactic and media-pedagogical as well as learning theoretical orientations.

CAD (computer-aided design)

Computer aided design refers to the support of design tasks by means of EDP for the manufacture of a product (e.g. buildings).

CAGD - Computer-Aided Geometric Design

refers to the computer-aided description of the shape of geometric objects. It deals with the description of two-dimensional curves as well as three-dimensional surfaces and bodies.

CAM= Computer-aided manufacturing

CIM- Computer Integrated Manufacturing/Building

The CIM method also deals with data use. In contrast to BIM, planning data is directly transferred digitally to production (e.g. in timber and precast concrete construction).

Digital construction document

An electronic construction file with which all internal and construction processes can be depicted and completely documented. For construction projects it is important to be able to query the current status at any time. Documents can be controlled and logged in an electronic archive and edited.

Digital twin

A digital twin is a digital representation of a tangible or intangible object or process from the real world in the digital world. It is irrelevant whether the counterpart already exists in the real world or will exist in the future.

EU BIMTG

EU-BIM Working Group

http://www.eubim.eu/wp-content/uploads/2018/02/GROW-2017-01356-00-00-DE-TRA-00-1.pdf

HOAI

Fee schedule for architects and engineers (Germany)

LMS - means Learning Management System MS, also used is the term Learning Management Software. It is a platform that combines various functions.

As a complex content management system (CMS), the system enables to support teaching and learning processes, to manage learning materials and user data as well as to control the execution of courses including test procedures.There is a need for schools to use a system to have an overview of their students' progress and grades.

LOD

Degree of finalization, defines the necessary information content and level of detail of the digital building models.

A large number of 400 terms (in German and English) are available at

https://www.baunetzwissen.de/glossar/a?thema=bim

https://bimdictionary.com

SOURCES /Other recommended links

https://group.thinkproject.com/de/ressourcen/bim-glossar

https://www.dbz.de/dbz-newsletter_3275088.html

https://de.wikipedia.org

https://www.computer-spezial.de/artikel/baustelle-4-0_3265917.html

https://www.easy-lms.com/de/wissenscenter/wissenscenter-lms/was-ist-ein-lms/item10182

https://www.baunetzwissen.de/bim/fachwissen/grundlagen

Contact to the partnership

Germany

BGZ Berliner Gesellschaft für internationale Zusammenarbeit mbH
Pohlstraße 67
DE – 10785 Berlin
Telefon: +49 (30) 80 99 41 11
Telefax: +49 (30) 80 99 41 20
info@bgz-berlin.de
www.bgz-berlin.de
www.fit4bim.eu

Hochschule für Technik und Wirtschaft Berlin
University of Applied Sciences

www.htw -berlin.de

Max-Bill-Schule
OSZ Planen | Bauen | Gestalten

www.max-bill -schule.net

Belgium

ROBERT-SCHUMAN-INSTITUT

www.rsi-eupen.be

www.weiter - mit - bildung.be

Denmark

AARHUS TECH

www.aarhustech.dk

VIA University College

www.via.dk

Poland

poznan university of technology
institute of structural engineering

www.put.poznan.pl

ZSB POZNAŃ Zespół Szkół Budowlanych

www.zsb.com.pl