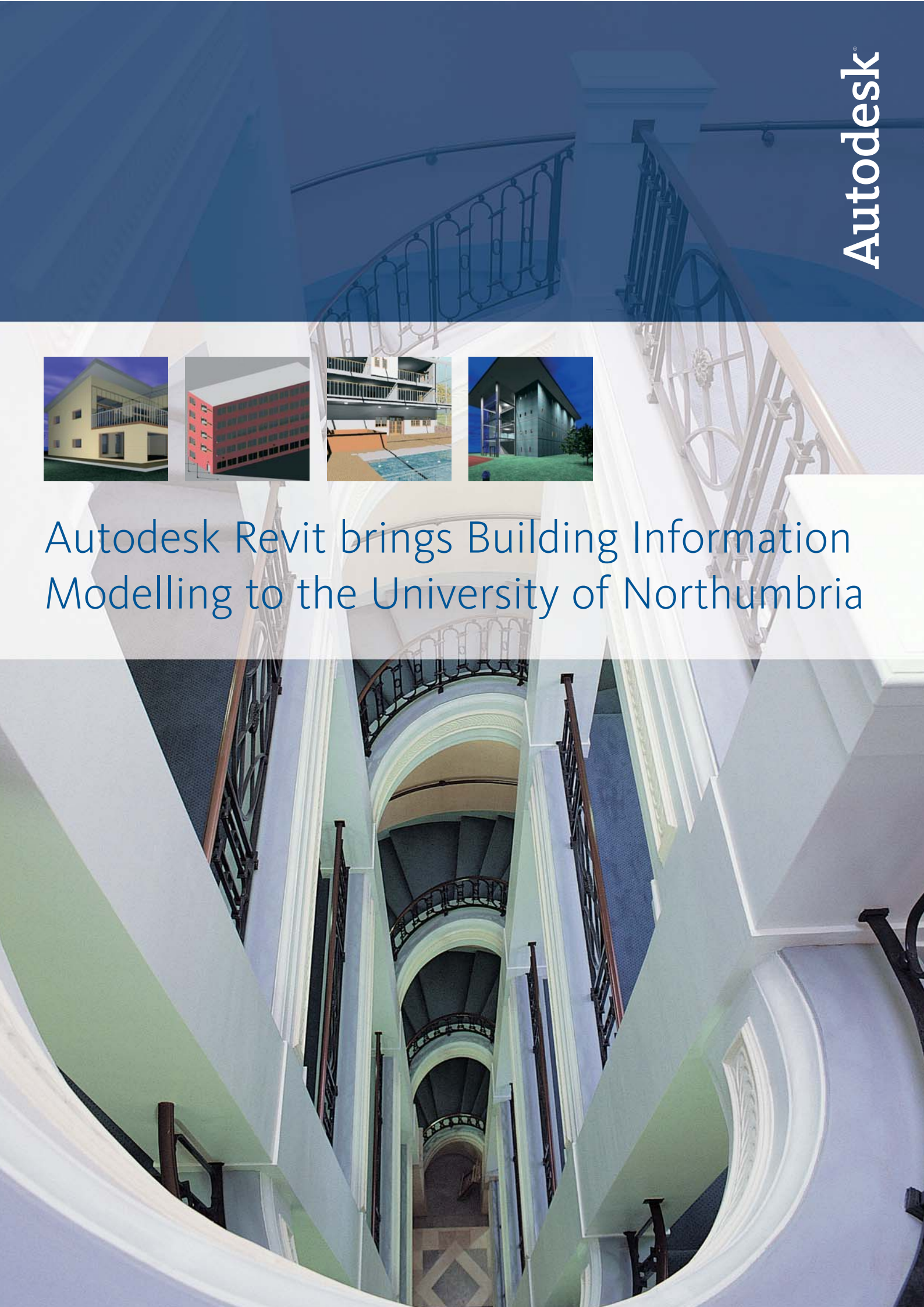




Autodesk Revit brings Building Information Modelling to the University of Northumbria





“Because all elements are drawn in 3D, rather than being transformed from 2D into 3D, complex buildings can be modelled in a much shorter time than it would take with AutoCAD”.

“I feel that Revit has improved my design skills. To be able to move effortlessly between plan, section, elevation and 3D views makes the whole process easier to visualise and a lot more enjoyable than working totally in 2D”.

Because the software is doing the 3D geometry creation for you – surfaces, faces, planes, etc. – you have more time to focus on how the building looks and how it is being put together.

Revit creates a 3D model from which you can generate plans, sections and elevations. Any changes to the 3D model will be reflected in the elevations and vice versa. Also, the warnings that Revit provides to flag potential problems are very useful and really assist the design process.

Revit’s Help system and tutorials are easy to follow

At the University of Northumbria’s School of the Built Environment over 1,600 students learn a wide variety of disciplines, including Architecture, Architectural Technology, Building, Building Services Engineering, Building Surveying, Estate Management, Housing, Project Management and Quantity Surveying.

The School’s BSc in Architectural Technology was introduced in 1998 in response to a growing need for specialists to bridge the gap between design and construction, having the skills to resolve design and technical issues and ensure optimum building performance and efficiency. The degree is a 4-year course structured around several key areas, including a Computer Skills and CAD programme which introduces students to 2D design in AutoCAD® followed by computer-aided visualisation and 3D modelling. Having spent their third year on placement, Year 4 students learn animation techniques using 3ds max® and interactive virtual reality software.

A new way to design and build

In 2004, the Architectural Technology degree programme was extended to include lectures in Building Information Modelling (BIM), an innovative approach to building design, construction and management which increases efficiency and reduces risk throughout the process. To give the students practical experience in BIM, the School purchased Autodesk Revit, a building design and documentation system developed specifically for Building Information Modelling. Senior Lecturer, Margaret Horne, explains why they opted for Revit.

“Last year, two of my colleagues who are both Building Surveyors came back from a Revit Educational Seminar with glowing reports of the software. Their enthusiasm prompted me to investigate further and, following a Revit presentation by an Autodesk Education Reseller and a representative from Autodesk, we decided that the software was the

right choice for Year 2 students taking the 3D Computer Modelling module within the Architectural Technology programme”.

“For us, the deciding factors were ease of use, file transfer capabilities, seamless integration of 2D and 3D, plus the security of buying a product from a reputable software house”.

Dynamic 3D modelling

At the heart of Autodesk Revit is a parametric change engine which uses the information captured as you work to build a network of relationships between elements. So whenever you change something, Revit automatically applies the change to all affected elements.

Before introducing Revit to her students, Margaret Horne took advantage of the tutorials supplied with the software, which she describes as “excellent” in helping her get to grips with the package. Under Margaret’s guidance, the students were

also up to speed quickly.

“The tutorial materials gave the students exactly the right amount of information to learn how to use Revit. Then they began to apply the software to a design they had developed for a professional practice project”.

“Some students worked on a multimedia learning resource centre that was specified to be a modern, spacious framed building with a total of 5 storeys, creating a good working environment for quiet, concentrated learning activities. Other students applied Revit to the design of a modern house”.

“Throughout the modelling process, which spanned just 12 weeks, it was clear that Revit was encouraging the students to think of the building as a whole. As they developed their 3D models, they were faced with the construction implications of their design decisions. This is because Revit, as a building information modeller, tracks how building components are linked together. As a result, the students learnt that things have to be right!”

Revit inspires impressive results...

Revit users are great advocates of the software, claiming that it works the way they think, in terms of the entire building, rather than individual sections and floor plans. They also comment that it provides more accurate and complete information, giving them a clear overall vision of a project and better design insight, which helps them to work faster and more thoroughly. Margaret Horne agrees wholeheartedly with this feedback.

“The students began to design with Revit much more quickly than with traditional CAD software. The interface is very logical and allows them to enter information graphically rather than via a set of complex commands. As a result, they're more enthusiastic and there's evidence that they've had more time to focus on the building design instead of learning to find their way round the software.”

Margaret recalls a degree of hesitancy among students already proficient in AutoCAD who were concerned that

learning Revit might undermine their existing experience. However, once these students became familiar with the Revit interface, their initial concerns were quickly dispelled and the software inspired some very innovative work.

“The students produced a wide range of presentation material, including 2D plans, sections and elevations generated from 3D models, along with 3D renderings with background imagery. Some designs really tested the package and the final project work displayed some impressive results for such a short time. There were buildings with expressive forms, elaborate geometry and non-standard components, and one student even incorporated curved I-section beams using Revit's Sweep facility.”

The students were also encouraged to use their Revit building designs in an investigation into the thermal characteristics of building elements and the effect of façade design. Linking Revit with IES Virtual Environment, a programme designed to simulate real environmental conditions on a building model, they found that modifications to the Revit design could be made quickly in response to the thermal analysis output.

...and wins widespread approval

After a 6-month Revit pilot, the School has invested in a campus agreement which includes 200 licences for Autodesk AutoCAD Revit Series, which comprises of Revit and AutoCAD, and a bundle that combines Revit and AutoCAD, and 40 licences for 3ds max. Margaret Horne is confident that the software will be used extensively.

“It's excellent that Autodesk are bundling these two pieces of software together. We need 100 licences for our labs and staff and the campus agreement allows us to sell the additional 100 licences to students so that they can use Revit and AutoCAD on their home computers. This eases the load on the University's IT resources and enables students to work on design and modelling projects at their convenience.”

There's a growing interest in Building Information Modelling across the School of the Built Environment and

and very useful, as are the various User Groups and Forums now available on the Internet.

Revit's user interface works in a very logical way.

Revit has a very good library of materials to choose from. For specific projects, materials can be edited easily or obtained via libraries on the Internet.



For us, the deciding factors were ease of use, file transfer capabilities, seamless integration of 2D and 3D, plus the security of buying a product from a reputable software house.



We think that Revit sits well in the Architectural Technology programme and the current feeling about the software is very positive.

ten academics from a range of disciplines are to attend a 2-day Revit training course run by an Autodesk Education Reseller. Margaret hopes that this will encourage them to regard the software as more than “just another CAD package” and appreciate that its modelling approach brings benefits to the design, construction and management phases of the building cycle.

“We think that Revit sits well in the Architectural Technology programme and the current feeling about the software is very positive. With improved awareness of what Revit can do, I’m confident that colleagues from other degrees will recognise the advantages of BIM and include it appropriately in their course programmes, giving us opportunities for shared learning and improved cross-disciplinary understanding.”

Having seen how well Revit interacts with IES software, John Thornton, a Principal Lecturer in Building Services Engineering (BSE), plans to introduce the Autodesk package to his students:

“Revit will enable BSE students to effectively show the iterative process involved in building inception and feasibility design in rendered 3D

images. Revit should significantly enhance the presentation of feasibility analysis reports on the thermal performance of building façade options and environmentally conscious building designs. It is hoped that the development of BSE mechanical / electrical components within Revit will prove to be another significant step forward.”

The future of building design

Having seen the impact Revit has had on her Year 2 students, Margaret Horne believes that using the software for Building Information Modelling is the way forward.

“When asked to predict 21st century developments, top executives in the CAD industry have forecast an increase in the acceptance of 3D modelling and the possibility of working in a 3D environment from the beginning of the design process. In my opinion, Revit is a product which will enable this to happen and the emergence of a new generation of students with leading-edge 3D skills will help to meet the needs of a profession concerned with technological advances and complexity.”

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