POSTGRADUATE EDUCATION IN BUILDING SCIENCE AT DANUBE UNIVERSITY KREMS


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Summary

At the Department for Building and Environment we practise post graduate education for building planners since 1996. Our premium program is the postgraduate, parallel to job University Course "Master of Building Science".

The curriculum covers knowledge and skills in environmental friendly and energy efficient design. The attendants can chose between three special fields those are Solar Architecture, Climate Engineering and Refurbishment.

The group of attendants typically consists of around 10 persons per special field. Students are mostly architects and engineers. Teaching is done by skilled Architects and Engineers and by Scientists as well.

Starting in October 2008 we will change the teaching language to English.

The paper presents the structure and the contents of the program and brings to discussion our experiences in running the course. We offer cooperation with other Universities and other institutions, happily in central Europe.

Keywords: Education, integrated design process, solar architecture, indoor climate engineering, retrofitting management

1 Introduction

The Danube University of Krems is Austria's University for postgraduate education. It is devoted to high-quality and practice-oriented supplementary education on the basis of relevant academic as well as professional experience. The Department for Building and Environment with its special field Architecture and Engineering is engaged in education, consulting and research in the field of energy-efficient, ecological buildings and building-related health issues.

Our premium product is the university course "Master of Building Science" with its special fields Solar Architecture, Indoor Climate Engineering and Restoration Management. The course exists since 1996 and has been continuously developed further since. It lasts two years and can be attended additional to full time work. Our graduates get

a profound supplementary qualification which makes them fit for the challenges of planning energy-efficient and ecological buildings.

Target group are architects, members of planning offices and decision-makers of administrative authorities. Each student has to pass an admission-test, to prove his knowledge and his educational background. As a novum professional experience can be traded in for lacking academic background. This was a little bit of an experiment and it works very well since.

In 1997 the course was awarded with the European Solar prize from EUROSOLAR. And it has been presented and discussed at many international conferences since.

The curriculum is subject to continuous development. Today students can chose between three special fields those are “Solar Architecture”, “Indoor Climate Engineering” and “Restauration Management”. Additionally there are elective courses of three weeks each in the subjects of “Light design” and “Indoor Plants”.

Factbox

Name of Study	Master of Building Science
Special fields	Solar Architecture, Indoor Climate Egineering, Restoration Management
Target Group	Architects, Building Service Engineers, Civil Engineers
Type of Study	Postgraduate, parallel to job
Duration	Two years
Costs	EUR 13.500,-, including teaching, course material, exams, distant learning
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2 Teaching Targets and Teaching Experiences

People who study at Krems are grown up professionals. And they pay good money for their studies. So they ask for a lot.

2.1 Empowerment and Enrichment

Our main teaching target is the empowerment and the enrichment of our students. They are meant to get all the knowledge, skills and mindset, too, that help them to make a good career out of the challenges of not less than good and sustainable solar and engineering.

The attendants of our courses may expect to learn:

- How to react architecturally to the special qualities of the place, including temperature, wind, rain, thermal solar gain, daylight and others.
- How to optimise energy demand and solar energy gains by means of thermal insulation, glazing and natural ventilation.
- How to introduce and dimension technical devices for heating, ventilation and cooling on the basis of renewable resources
- How to put the puzzle of principles and techniques together in a way that lasts: Ecologically, socially and economically.

2.2 International Dimensions

Solar Architecture is more a paradigm of designing than a set of given solutions. It is a crucial principle of solar architecture to study carefully what is found at the special site and to react on these circumstances. It is a big help for students to learn this new way of designing by looking over the borders of the own country and the own climate region. Therefore the Krems-community is an international one and the teaching language will be changed to English from 2008 on.

2.3 Give and Take

Postgraduate teaching is a play of give and take and always has to be. Students learn from teachers. Students learn from students. And teachers learn from students, too. There's no shame in it. Everybody brings in his and her knowledge and experiences. And everybody takes from the others. We strongly believe that university post graduate education has merely to create situations and spirits where learning takes place than to teach in a way of a one way road.

Besides: Ongoing Education is not private lessons for latecomers. It’s the other way round: Our courses are meeting points for oerformers, best for those who want to stay in the first row.

2.4 Science and Practical Experience

We strongly believe that our program has to give our attendants real chances and real tools to be successful in their careers. Therefore it has to be very practical. And we strongly believe that it needs a good scientific basis to make decisions right during the alltime new planning process. So it’s really an “and” between Science and Practical Experience, no “or”.

2.5 Experiences with distance learning programs

Our team was also engaged in contributing to several online-course in ecological building for architects and planners. We made our experiences with it. Good and bad ones, which I happily discuss with everybody who made experiences of his/her own. Distance learning offers chances. On the other side working together and fighting for ideas together can't be replaced. But every up-to-date teaching concept certainly has to include distance learning, too.

3 Organisational Aspects

3.1 Schedules

Ongoing Education is always in a competition with the time needs of the regular job and of private life. Therefore it has to be very efficient, for sure.

Our courses are organized in three semesters of teaching, followed by one semester reserved for working on the Master-Thesis. And within each of the three teaching-semesters there are only three lecture-blocks of one week each, with enough time in

between to keep on track in the job and in the private life. During the time between the one-week lecture-blocks there is some work at home, coached via Internet and Phone.

This concept of one-week lecture-blocks worked out very well. We think it fits best, compared to for example weekend teaching or continuous weekly lectures.

3.2 Teaching Teams

Postgraduate Students are grateful for practitioners as teachers. They want to learn from people who apparently share their own challenges. Therefore there has to be a good balance between scientific and down-to-earth inputs and teachers.

We made good experiences with an inner circle of about ten teachers who accompany the students through their studies, plus another ten or twenty lecturers who cover only a special field of interest.

And, last not least, teachers in postgraduate courses really have to be willing to share experiences. The good ones but the bad ones also.

3.3 Student Teams

We work with groups of 15 to 25 students in one class. This number of students showed to fit best to the workshop-oriented didactic concept.

Often discussed was the question, how broad the range of preliminary knowledge among the students may be. On one hand a divers structure of professions and skills gives a good basis for an intensive exchange process among the students. On the other hand there has to be a common requirement of basic knowledge to reach excellence. At Krems we achieve the balance by asking our attendants through an evaluation process, including a test and a personal interview.

Our main target groups are Architects, Building Service Engineers and Civil Engineers. In average they are in their mid thirties, with a wide range up and down.

4 Course Contents

Under the roof of “Building Science” we offer three branches of studies plus two electives.

The branches are
- Solar Architecture
- Indoor Climate Engineering
- Restauration Management

The Electives are:
- Light Design
- Indoor Plants

As already said, the two-year course is structured in nine one-week teaching-modules with three of them in each academic semester. After these teaching blocks there comes the Master-Thesis. Each of these weeks is dedicated to one special topic.

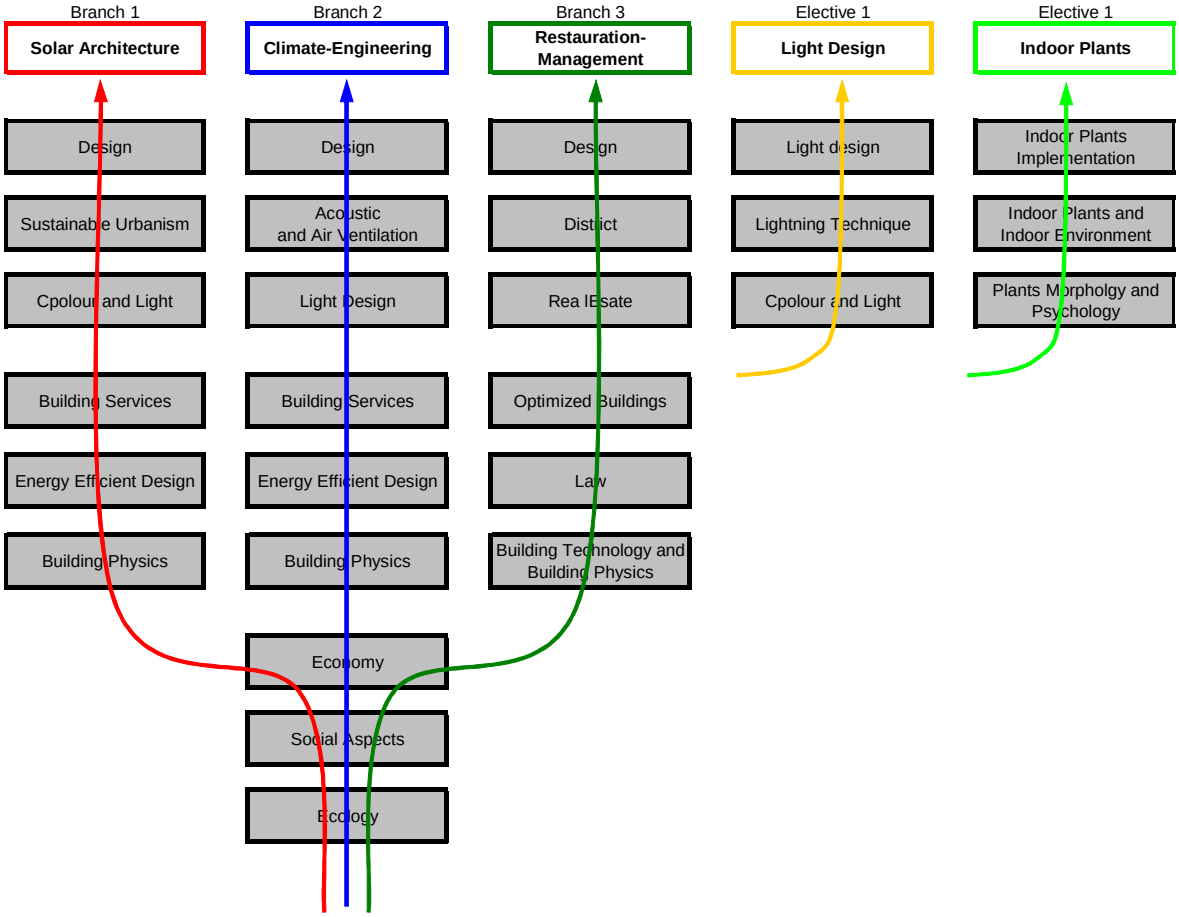

Fig. 1 The topics of the one-week teaching-modules

4.1 First Semester: Sustainability Basics

We start with three modules that give the basic knowledge for sustainable design decisions: Ecology, Social Aspects and Economy, always focused on real questions of the planning process.

4.2 Second Semester: Core Skills

The second semester is dedicated to teach and deepen core skills. In Solar Architecture and Indoor Climate Engineering it is the thermal optimization of buildings. In Restauration Management it is a sound mixture of technical, social, economical and legal aspects.

4.3 Third Semester: Special fields

During the third semester our students deal with special fields and practise their knowledge achieved so far. In the third semester students can switch to one out of two electives. A very new and very fascinating special field is growing in Light Design. We offer the facility of an artificial sky dome to carry out measurements and investigations.

4.4 Fourth Semester: Master-Thesis

The Master Thesis is a scientific piece of work which is carried out by each of the attendants. The Thesis is supported by two members of the faculty and is presented and defended by the candidates in front of a commission.

5 Concusions

In October 2002 there will start the new class of the program Building Science. The last one in German, since from 2008 on we will switch to English.

We're living in a time of life-long learning. That's true for our students as we much as it's true for us. Architecture and building related engineering are fascinating fields to deal with. Teaching in this field is so, too.

We are looking forcooperation, to share experiences and to learn from colleagues. We warmly invite everybody to communicate with us and to exchange experiences and points of view.

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