KU LEUVEN, Department of Architecture Faculty of Engineering Leuven, Belgium

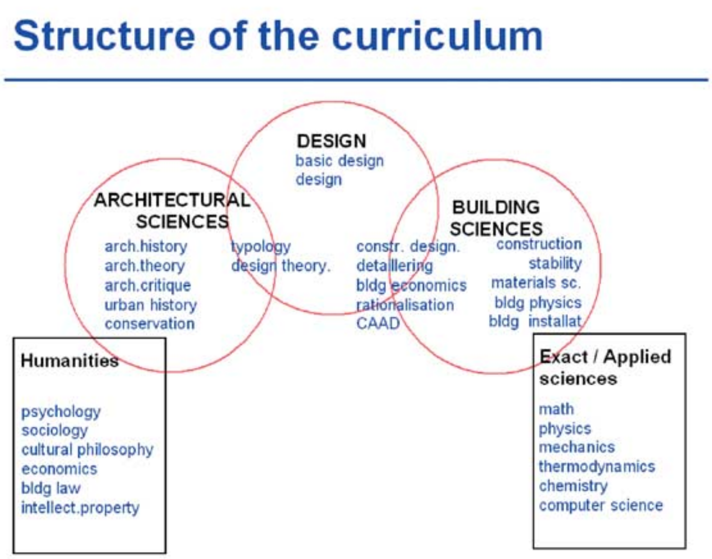
Herman NEUCKERMANS

What and Why

What is taught and why it is, reflects the profile of the school and the profile of its graduates. At KU Leuven the teaching of architecture is done in one of the departments of the faculty of engineering. Graduates are entitled 'engineer-architect'. Till the end of the 1960s the education programme was merely an engineering curriculum with a bit of architecture. From then on the programme was transformed over and over again towards an equilibrium between: architectural sciences, engineering and design, each of these accounting for one third of the students study load.

Being embedded within an age-old university, the teaching at KU Leuven is based upon research, as it always has been before.

The structure of the curriculum nowadays looks like follows:



This structure shows how exact and applied sciences are preceding/underlying the teaching of construction.

The philosophy underlying the pedagogical structure considers form, function and construction as indivisible constituents of architecture. It is a pitty that the discourses on 'shaping' architecture and building technology have been separated and nowadays live their own lifes. The ultimate achievement we are aiming at is educating students so well in construction, that construction it is not a problem anymore and that they can focus on the architecture they want to make, with the confidence of being able to solve it technically. The goal is shaping technology into the shape of architecture, especially in detailing the construction.

How

Construction as a subject is taught in many different pedagogical ways: ex cathedra courses (c), exercises (e), seminars (s) and last but not least in design (d).

Construction c/e/s/d

			c	e/s	d	future
1	traditional techno		x		x	housing
2	structural systems		x	x	x	doc 5 ex
3	bldng envelopes		x	x	x	bldng site report
4	cases	sem/visits		x	x	
5	cap selecta			x x x	x x x	high rise loadbearing glass structural glasing
	thesis: ex. digital details					
	visits: industry, manufacturers					

As far as design is concerned, construction issues are embedded in the pedagogical strategy over the five year curriculum:

At KU Leuven the design curriculum is laid out every year at the end of a two-day review in May of all previous design assignments of the past year. All design studio staff is present and confronted with the best, worst and middle class result of every assignment. Subsequently with the checklist 'Framework design curriculum' in mind, amendments are proposed, assignments are cancelled or kept, subjects, locations, accents are chosen and prepared for the following academic year.

In concreto, the design assignments focus on the following construction issues:

1st year: design of an architects club: detail of a stair

2nd year: execution drawings for a detached single house on a sloping site using traditional building technology (brickwork walls, concrete floors, wooden roof structure

3rd year: detailing of furniture design in the context of a museum design construction of low rise – high density housing determining subsequent improvements of insulation of an existing house

4th year: railway station design, computation and detailing of steel structure

laboratory design: integration of structure and equipment, dimensioning.

5th year: detailing a lightweight two-storey addition on top of an existing building.

Framework Design Curriculum

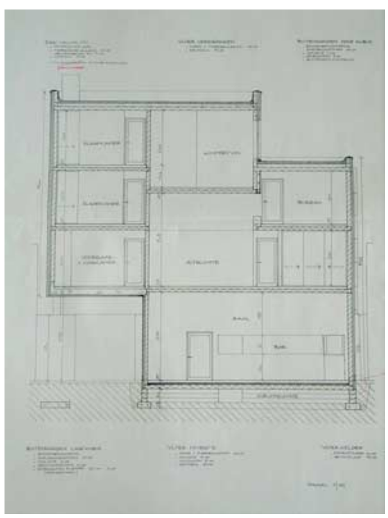
	phases					building	technology	scale	context	new/renew	indiv/team	method	presentation	tutoring
	PR	SD	PD	WD	specs	programmes								
						detached house	traditional	small	nature	new	indiv	trial & error	report	severe
						row houses	non-trad	medium	noware	renew	team	heuristic	2D drawings	regular
						mass housing	small span	large	new	reuse	interdisciplinary	metaphor	3D drawings	sparse
						utility	medium span	...	historical	restaure	...	feasibility	physical model	on call
						school	large span		fragmented	...		masterplanning	rendering	...
						sportscentre	low rise high dens		urban			...	computermodel	
						cafetaria	high rise		rural				...	
						museum	...		industrial					
						library			...					
						...								
	This sheet is a draft of a checklist to fill out for each project													
	This sheet (or a similar one) can be used as a synopsis to review the pedagogical goals of all the projects; it will show lacunas as well as duplicates													
											regular			
examples														
sportscentre	x	x	x	x		sports	trad / medium span	medium	new / urban	reuse	indiv	trial & error	2D/3D/model	regular
museum	x	x	x			museum	non-trad / medium	medium	historical	new	indiv	metaphor	computermodel	

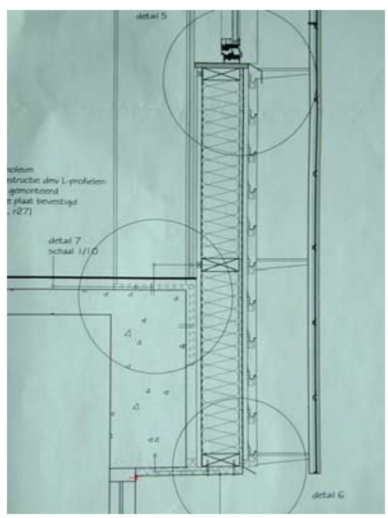
In the design studio most design assignments have a part devoted to construction issues. Although every design has to bear right from the beginning the solution for its formal articulation, its functional composition as well as its structural system, the structure and detailing are evaluated separately in order to guarantee that these topics do not 'disappear' due to all kinds of good reasons.

In teaching in general, the topic of construction starts from the first fundamental principles and it is taught to the students as a method of work to tackle the construction problems in that way. Afterwards come the applications.

Example: in making a hole in an outer wall, students are taught to think about: how does it stand up, what about water, what about thermal and acoustic insulation? From these principles, they start to design the technological solution.

Some examples of student work: year 4, year 2, year 5.





Who

Ex cathedra courses on building technology are taught by architects / engineers with experience from practice or with expertise related to architectural practice; they are appointed either as full professors at the university or as part-time academics.

Basic courses are taught by scientists / engineers who do research in this domain; these are full time professors at the university.

Seminars on construction and construction related topics in design studio are taught by engineer architects coming from practice; they have a part time appointment at the university and most of them belong to non-tenured staff.

Future

The future has to do with improving the actual situation and eliminating the weaknesses we experience currently:

1. the main shortcoming of the actual system is the lack of integration: ex cathedra courses are not linked enough to the design studio where the students find the motivation to study these subjects. We are thinking of concrete, steel and wood dimensioning and detailing. We are thinking of building physical topics like moisture, heat, daylight, sound. Integration is an intriguing topic with many facets: it is not merely a problem of planning in time and what has to happen in the student's head, but it also is demanding on the capabilities of the staff to be competent in integrating many different aspects of design. Indeed, no school can afford to put in the design studio a whole set of specialists at the disposition of every single student. Subsequently staff has to be competent in many different aspects of design.
2. more emphasis on construction: ' reclaiming land', more time (than now) devoted to issues of construction i.e. structure and detailing. It includes reactivation of the 'materials museum', updating and accessing easily the building products documentation,...
3. every single design assignment will have to show (prove) its construction principle; deliverables will include structure and details.
4. in the design curriculum more emphasis will go towards 'more' technically oriented projects like a railway station (large-span problem), laboratories (integration of structure and 'piping').