F H A

Project Oriented Learning Environment
University of Applied Sciences Aargau, Switzerland

An Interdisciplinary Learning Platform of
an International Network of Universities
Using Modern Information and
Collaboration Technologies

F H A

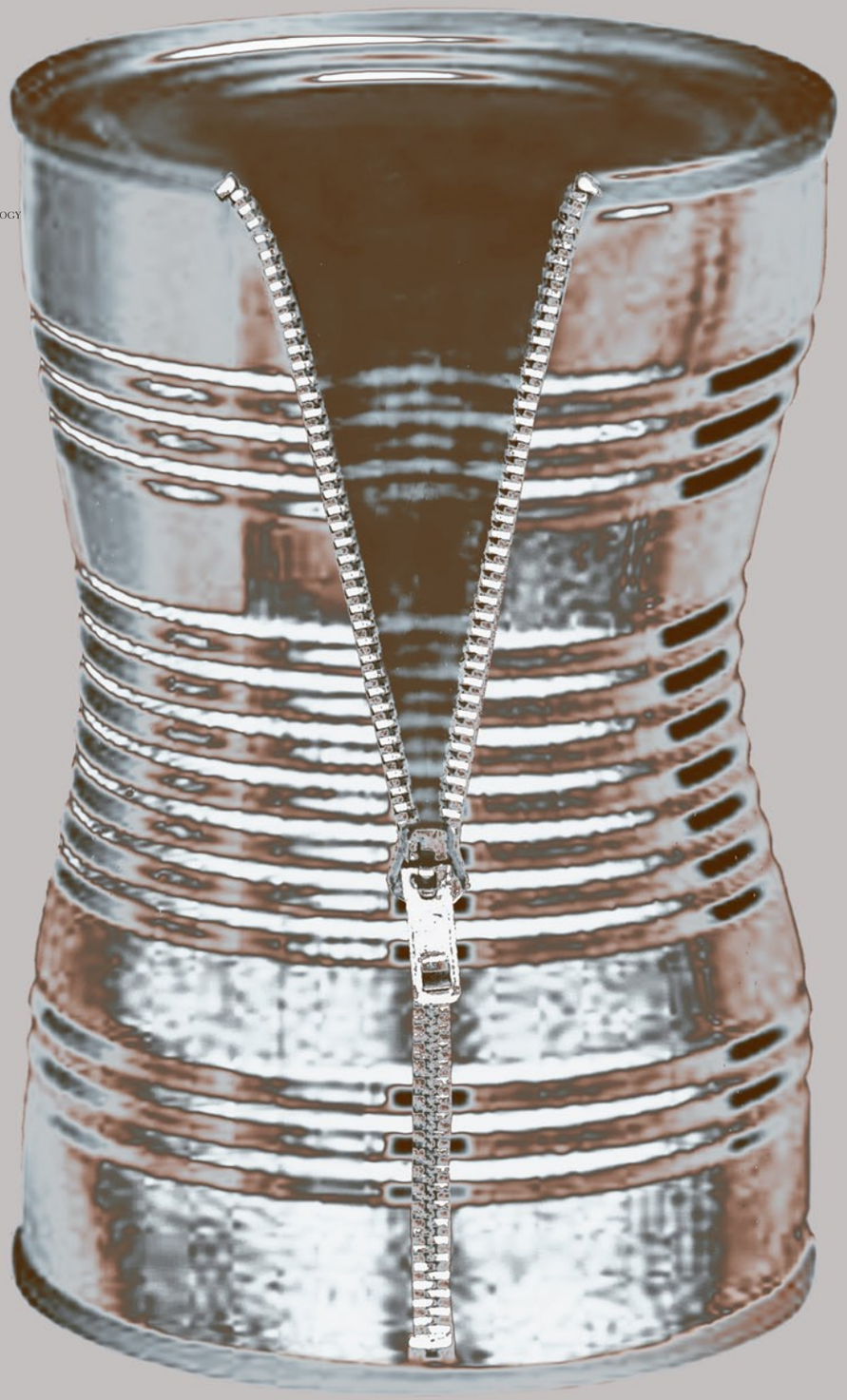
AALBORG UNIVERSITY

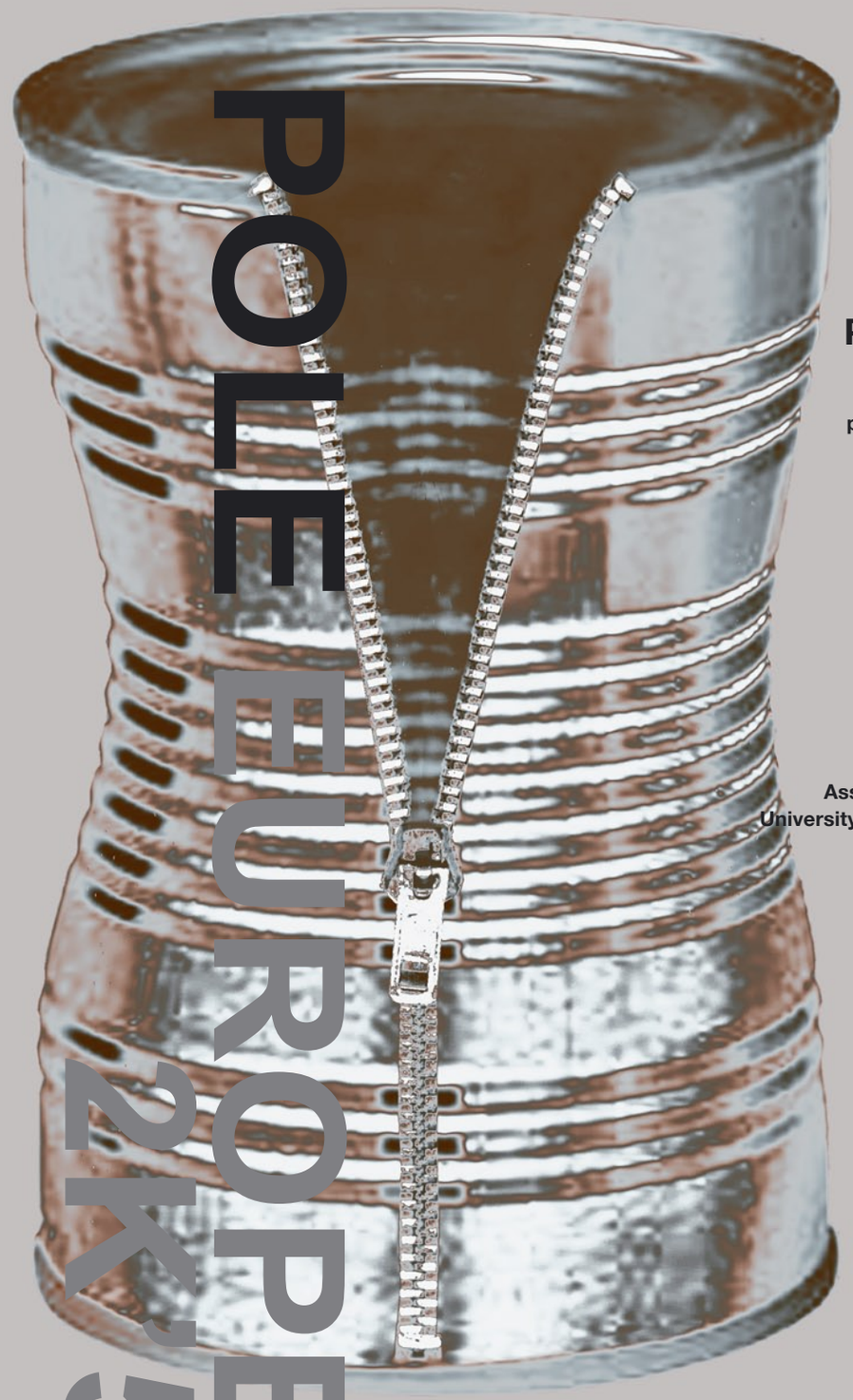
ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

HELSINKI UNIVERSITY OF TECHNOLOGY

[H S W]
HOCHSCHULE WÄDENSWIL

UNIVERSITY OF STRATHCLYDE





POLE EUROPE 2K5

Project CanPlus®

participation for students in:
industrial design
plastics technology
material sciences
mechanical engineering
economics
marketing
food sciences
food technology
product design
process management

Assignment Summer Term 2005
University of Applied Sciences Aargau
Northwestern Switzerland

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Introduction: POLE Europe - A Platform for Learning and Teaching

University students are nowadays increasingly challenged within their specific core disciplines; in addition however, they are also supposed to develop skills in order to apply this particular knowledge in practice. This ideally goes hand in hand with a sense of maturity of the individuals' characters vis-à-vis the social, cultural, and economical environment. The practical application of theoretical knowledge can thus only be implemented successfully if these three basic elements are taken into account.

In addition to university students' disciplinary knowledge, the ability to work efficiently within multicultural environments has become increasingly important. Universities are therefore looking to expand and deepen this particular aspect in order to provide the necessary expertise in this field. This realisation has led to universities becoming more proactive with regards to networking and offering joint courses, which is where POLE Europe (Project Oriented Learning Environment) is actively involved in. In the course of this new collaboration, it has become apparent that the complementary aspect has gained in importance. An example for this is the liaising between strongly research-oriented and more practically oriented universities with the common goal of being able to implement the according results as soon as possible. Apart from contributing to more comprehensive and efficient process work, the POLE courses lay particular emphasis on improved cultural know-how. In order to do this, students are encouraged to contribute their experiences within international teams, regardless of geographical and language barriers.

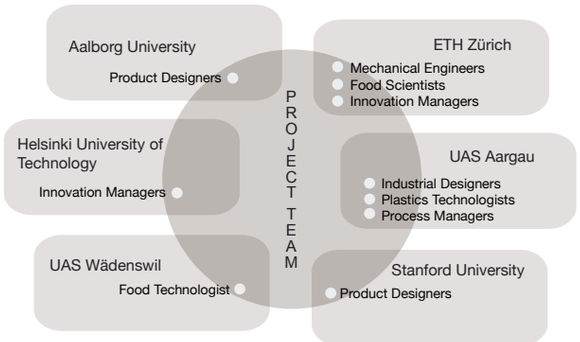
POLE Europe sees itself as a learning system cooperating with other European or international universities. It does so within a reflexive context, taking into account the various cultures involved in order to create new methods of resolution regarding teaching and learning methods. The students are at the core of this concept, and are given the option to develop process-oriented expert knowledge through interdisciplinary teamwork. Simultaneously, they learn to work independently and to deal with current problem cases through the use of modern information and communication tools.

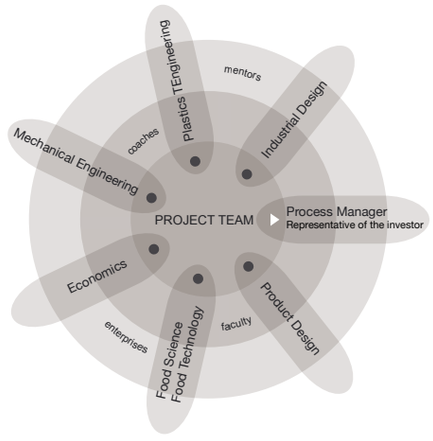
Processes within POLE Europe are largely organised within the individual teams themselves. The according goals are set and committed to within the teams; in case of resulting conflicts, weight is given to iterative processes in order to find solutions. A further characteristic of POLE Europe is an increasing tendency for the overlapping, or even amalgamation, of various lines of work in order to give way to new, holistic, and interdisciplinary perspectives. POLE Europe is a comprehensive platform which gives students the opportunity to contribute their full potential. Each individual's attitudes, characteristics, and abilities are taken into account as a whole in order to allow as much space as possible for independent development of students' responsibilities and skills. A contribution to the concept of 'Campus in Mind' is made by POLE Europe in providing the multi-disciplinary teams with learning facilities that are based on experimental and interactive technologies.

The teamwork in the POLE Europe courses allows the students to further expand their specific professional skills; on the other hand, it also gives them the opportunity to develop more generic competences, which nowadays is one of the key qualifications in order to be able to adapt to a continuously changing environment. The course also enables students to evaluate their ability to function in a team and to analyse their styles of communication. Through practical examples, students are given the opportunity to explore how well they are able to work in a team, and to what degree they are flexible to accept members' concerns from other disciplines, i.e. how they can integrate these into their own work and patterns of thinking.

Experts and mentors which do not form part of the university, but are active members of businesses and the industry in general, are an essential part of POLE Europe courses. Their participation contributes a high degree of practical knowledge to the projects, pointing out the actual 'state of the art'. In this manner, POLE manages to link academic education and professional practice. The intensive interaction between these two elements guarantees a rapid transfer of technology, while at the same time ensuring that the students involved are motivated to a high degree.

POLE is not only about to significantly remould the landscape of teaching and learning at universities, but it also intends to wield substantial influence concerning decision-making and the creation of practical work processes. In association with university teaching staff, the mentors are instrumental in contributing expert knowledge and regular feedbacks to the teams, while they are also actively involved concerning the evaluation of processes and related products. The latter will be of increasing importance in the future, as scientific research has been initiated in connection with reflections of certain POLE processes. It is the intention of this kind of research to support students with regards to the awareness of their personal learning styles. The findings will then be made accessible for future work in a broader context.





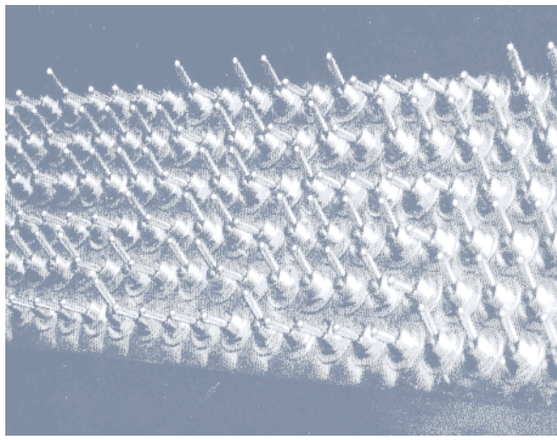
Further POLE research issues include for example the creation of knowledge databases, which will serve as a tool for more rapid evaluation of solutions and decision-making processes in the future. These efforts are based on the knowledge that a large part of creational, construction, and design processes are substantially shaped by re-design.

The initial POLE courses had been launched as a result of the ever increasing demands in the current building trade, which is of a highly complex, segmented, and competitive nature. Experts from the fields of architecture, civil engineering, and construction management are clearly demanding a broader education, along with more diversified core skills for engineering students. The POLE learning environment and its associated methodology is not limited to this initial context, but allows students from practically any discipline to apply their theoretical knowledge in practical cases. Through collaboration in interdisciplinary teams guided by process management students, students from fields such as architecture, urban planning, civil engineering, interior design, plastics engineering, mechanical engineering and economics were given the opportunity to cooperate in POLE projects and thus better understand the individual processes involved and acknowledge their relation to the social, economical, and political dimensions.

The present POLE Europe course offered during the summer semester 2005 will bring together the disciplines of food science and food technology, mechanical engineering, plastics engineering, product design, industrial design as well as economics with students and faculty from University of Applied Sciences Aargau, University of Applied Sciences Wädenswil, the Federal Institute of Technology ETH Zürich, (all Switzerland), Helsinki University of Technology HUT (Finland), Aalborg University (Denmark) and Stanford University (USA).

Responsibilities of POLE Europe and its Partner Universities

POLE Europe considers itself as a learning platform which enables and facilitates interdisciplinary processes. It has also proven to offer a test bed for research in the field of modern teaching and learning as well as in the field of evaluation of novel learning spaces. At the same time it is important to put on record that the responsibility for the disciplinary supervision of the students remains with the sending home universities. This relates also to the grading of the students' contribution. POLE Europe on the other hand will provide a qualification on the team processes and on their interaction patterns. (It is suggested that students who successfully participate in POLE Europe projects receive academic credits based on the ECTS.)



The experience during the previous POLE courses has revealed that this double responsibility of the student towards his/her POLE team and towards the home university and professors, respectively, may also bear conflicts. POLE Europe demands that team decisions be respected what the approach and the agreed objectives is concerned; POLE leaders are convinced that within this frame work there is still ample tether to adhere to high academic standards in the disciplinary work.

Saying this makes it obvious that a close accompaniment and monitoring of the project by the faculty of the partner universities is essential and highly welcomed by POLE Europe. The involved faculty will receive full access to all documents of the POLE project. Their participation during the kick-off events, the reviews and the final presentations will add to the interdisciplinary depth and thus to the quality of the project and to further developments of POLE Europe.

Assessment

POLE Europe has the ambition to continuously improve its learning and teaching platform. One step to do so is by integrating an external assessor into the process, who will participate in as many of the POLE Europe design activities. POLE has cooperated in this field of evaluation and assessment with the Department of Education of the University of Applied Sciences Aargau and with Stanford University since the very beginning in the year 2000. The participatory assessment will focus on the effectiveness of the design processes and the adequate use of collaborative communication technologies.

Project Task

The packaging of a product is a complex issue: The envelopment has on one hand to protect the content, but it has also to allow an easy – often reclosable - access to it. It is the wrapping which carries the information of the enclosed goods. The packaging is also the instrument to attract the attention of the customer. The packaging helps to identify the brand of a single or of a whole family of products. In many cases the container costs as much as the content and therefore is a relevant economic factor. Also with respect to sustainability and environmental issues, packaging strategies become of core importance for companies. After all, it is the packing which allows for the (global) distribution of goods. It hence cannot surprise that packing technologies are of major impotance also in science (e.g. bionic materials) and research. Finally, it is interesting to note that the various types of wrappings of goods are deep-rooted in the traditions of the different cultures. In conclusion one might dare to say that the packaging is the soul of a product.

For more than 100 years Nestlé has been producing and marketing concentrated liquid milks (sweetened and unsweetened) all over the world. One of the key

factors for the success of this product category has been Nestlé's ability to offer these products in an affordable and safe way through the use of tin cans. As a matter of facts tin cans are not only an efficient carrier to bring the products to the consumer but also provide a perfect protection in order to preserve the nutritional values of the milk.

Nowadays the consumer needs have clearly shifted from basic food requirements towards conveniences and pleasure. The traditional in-home use of the product is more and more replaced by "out of home" or "on the go" consumption. In that sense the traditional tin can is clearly facing its limitation and is today viewed in many parts of the world (in particular in Europe) as inconvenient and old-fashioned.

The objective of this project is to propose innovative packaging concepts that are: helping to rejuvenate the traditional image of the brands and that are underlining the culinary purpose of the product in the market place. Furthermore the packaging concept needs to fulfil the consumer's expectations in terms of improved convenience by providing easy openability, reclosability of the packaging and clean/hygienic dosing of the product. The packaging concept should provide an attractive appearance at the point of sale and contain an ele-ment of novelty and "proprietaryness". Further more it would be an additional benefit if the proposed solution could be integrated into the exist-ing base technology (e.g. of a 3 piece tin can) thus mini-mising the impact on investment requirement and overall packaging cost.

The design task of each POLE project team is the development of one concept proposal, which honours the fact that an attractive, contemporary and ergonomic design plays a key role for the success for each consumer good at the point of sales. The design proposal should be visualised through 3D renderings and a functional sample of the prototype shall be produced in order to demonstrate the functioning of the proposed solution and to test it in the market place.

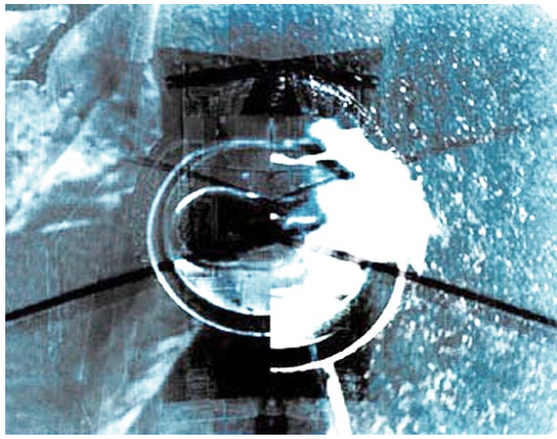
It is expected that the proposed solution has been assessed from a feasibility point of view and that the implications on existing or new technologies are understood and documented. The route to market, respectively the development requirements need to be defined both in terms of resources and timing. This does apply to all involved steps along the supply chain including the food-processing part. A clear understanding on total packaging cost will need to be established on the proposed solution.

Some form of market research (focus group discussion, qualitative consumer tests) needs to be done in comparison to existing packaging formats in order to assess the acceptance of the proposed solution in the market place. The feedback must be used in order to improve and optimise the concepts.

Competitive advantage through a strong protection strategy is a key factor for business success. It is therefore expected that the proposed packaging concept is being clearly defined in terms of protectability respectively proprietaryness without, however, infringing existing intellectual property rights.

Process Design

POLE Europe as a platform for learning and teaching not only focuses on the product but puts strong emphasis on the structuring of the design process. The following list of deliverables shall facilitate the work process for the teams as a back bone.



At the end of the kick-off week (April 2, 2005):

- Written statement of the objective(s)
- Concept of the information management (using ICT) by each team
- Description of the anticipated contributions of each student as a member of her/his team
- Commitment of each team member on a (preliminary) milestone structure

At the first review (April 22, 2005):
(duration of presentations 30 minutes/team)

- Verification of team's collaboration strategy
- Clarification of contributions of each team member (written document); reflection about changes or confirmation of one's own role within the team
- Intermediary results, presented (2 days prior to the review) on the intranet (team web page)
- Documents of work in progress (log book)
- Refined sketches of envisioned product

At the second review (May 27, 2005):
(duration 30 minutes/team):

- Intermediary results, presented (2 days prior to the review) on the intranet (team web page)
- Verification of roles
- 1st versions of all deliverables due at the final presentation
- First mock-up(s) of prototype
- Clear concept of final prototype
- Definition of remaining milestones (segmentation; who does what?)

Final presentation (June 23 and 24, 2005):
(by June 21, midnight): Presentation of all relevant results in team's web page on POLE Europe intranet portal. Note: Inputs will be blocked thereafter.)

- Oral presentation (duration: 45 minutes/team) for colleagues, faculty and jury – using the team's web page as primary and central means of information and visualisation; including: Comprehensive documentation of product (possibly of a whole product family), production method(s), production cost, consumer insights, marketing, sustainability, transportability.
- Potential for future research and development of CanPlus® follow-ups
- Detailed evaluation of individual learning and insights
- Comments on success factors and/or pitfalls of interdisciplinary design teams
- Suggestions for future POLE Europe projects

Deliverables (hard copy)

At the end of the kick-off week:

- Written statement of the objective(s)
- Concept of the information management (using ICT) by each team

At the first review:

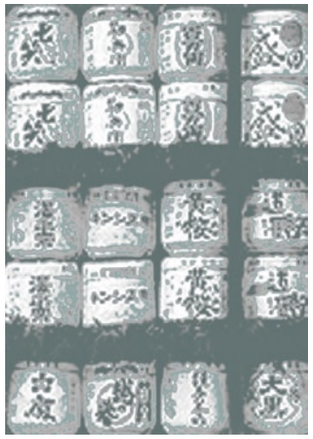
- Team web page
- Refined sketches of envisioned product

At the second review:

- Mock-up(s) of package prototype
- Refined process plan (milestones) for final phase of the project

Final presentation:

- Visualisation of proposed design by 3D renderings.
- Functional sample of the prototype (scale 1:1)
- Comprehensive documentation on (1) the team's web page, as well as (2) through physical documents (e.g. scaled plans according to production standards) of
  - product
  - production method(s)
  - packaging cost
  - protectability
  - consumer research/ marketing concept
- Convincing sales brochure and/or video clip of product
- Process handbook in English (10 copies of the printed version and on CD-ROM)



Information and Collaboration Technologies ICT

With its interactive 'i-room' POLE Europe is offering a modern infrastructure with respect to information and communication technologies (ICT). POLE Europe encourages the partner universities to support their students with respect to ICT as much as possible, in particular granting them access to their own information technologies.

The following list of ICT tools characterizes the necessary standards:

- 24 hours per day access to work stations, so students can work on their tasks and are able to communicate at all times (Windows 2000 Pro, Windows XP)
- 24 hours per day access to telephones with international access for conference calls
- Video conferencing facilities (available at least 2 hours per week and team)
- Suitable IT support (firewalls, basic support)
- Internet access with at lest 256 kBits/s
- MS-Office including Powerpoint and Frontpage, Acrobat Reader, ZIP and FTP programmes

During the kick-off sessions POLE Europe will provide instruction in the use of data transfer tools for the sharing of disciplinary applications. In cyber lectures and discussion forums POLE will be offering also support with respect to information exchange and protocols.

Restriction: It must be noted that for simultaneous communication there is only support provided by POLE for operating systems Windows 2000 (and higher). The POLE Europe ICT experts will also assist the teams in terms of security of internet interactions in the confidentiality context.

Team Composition

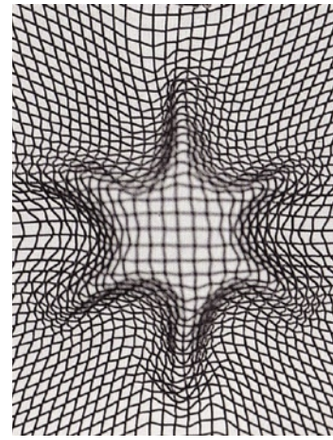
The POLE Europe CanPlus course is based on the partnership of University of Applied Sciences Aargau (with its faculties of industrial design, plastics engineering and process management), University of Applied Sciences Wädenswil (food technologies), Aalborg University (department of production and institute for architecture & design), ETH Zürich (institute for mechanical systems, department of food sciences, institute for technology and innovation management) and Helsinki University of Technology HUT (institute for innovation management).
40 students in five interdisciplinary teams will work on the design and development of a novel packaging system for Nestlé PTC, Konolfingen, under guidance and supervision of 16 faculty members.

Evaluation Criteria

The evaluation of the project results will be in the duty of a jury. It will consist of one member of each discipline and two members of the POLE Europe directorate. Each team will receive a report with an acknowledgement of the contributions according to the following criteria: (1) fulfilment of Nestlé's requirements (a list of specifications will be handed out during the kick-off week by the patron), (2) economic efficiency and feasibility, (3) innovation of solution(s), (4) suggested production methods, (5) presentation of product on web site, (6) general impressions.

Confidentiality Agreement

Due to the high potential of such a novel product in the food sector, Nestlé and POLE have agreed to respect a confidentiality agreement which in turn has to be signed by all partners involved in the project. Individual copies for each participant will be ready for signature at the kick-off event.



Budget for production costs

Each team is granted a budget of max. CHF 2'000.00 for materials and production expenses. Payments can only be made by POLE Europe against bills or (signed) receipts.

Cost of living and accommodation

Thanks to the financial support of sponsors and the industry partner Nestlé, POLE is able to partially subsidize the cost of living, transportation and those for the documentations and hand-outs for the participating students. Nevertheless, a contribution total of 200 Euro for the kick-off week and the final presentation events will be charged to each student. The participants are also responsible for insurance matters.

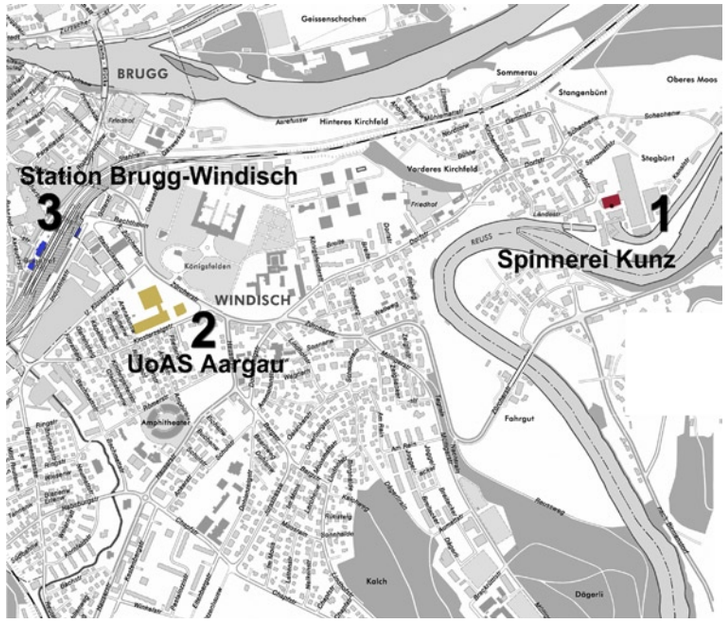
Program Summer Semester 2005

Kick-off	Event		
March 29, 2005	Arrival of Students and Guests	11:00	POLE Spaces
	Lunch	12:00	Spinnery
	Welcome	13:00	
	POLE Europe - What is It?	14:00	
	CanPlus Task	15:00	
	Assessment	15:30	
	POLE ICT Infrastructure	16:00	
	Team Formation I	17:00	
	Dinner	18:00	Canteen
	Team Formation II	20:00	Spinnery
	My Discipline - Our Task - Our Team	21:00	
March 30, 2005	Departure by bus	07:30	Parking Lot UAS
	Visit with Nestlé (Konolfingen)	09:00	Nestlé Team
	Special Nestlé Programme	11:00	
	Lunch	13:00	
	End of Visit	16:00	
	Return by bus	17:00	
	Dinner	18:00	Canteen
	Introduction to Process Planning 1	19:00	Spinnery
March 31, 2005	Group Work	08:00	Spinnery
	Input Process Planning 2	10:30	
	Lunch	13:00	Canteen
	Input Process Planning 3	15:30	
	Transfer to ETH Zürich	16:00	
	Presentation by Prof. E. Windhab	17:00	Cupola of ETHZ
	Library ETHZ	18:00	Cupola of ETHZ
	Refreshments	18:30	
	Introduction to Video-Conferencing System	19:00	ETHZ HG.D21
	Zürich by Night	20:00 - open end	

Kick-off	Event		
April 1, 2005	Self-Portraits of Faculty and Mentors	08:00	Spinnery
	Continued Work of Groups on Process ICT	11:00	
	Lunch	14:00	Mensa UAS
	Continued Work of Groups on Process ICT	15:00	
	Dinner	19:00	
	Group Work (Schedule Coordination, Expectations)	20:00 - open end	
April 2, 2005	Group Work (Sketch of Ideas)	08:00	Spinnery
	Lunch (Sandwiches/Drinks)	12:00	
	Presentation KOMBU	13:00 - 13:50	
	Presentation MISO	14:00 - 14:50	
	Presentation NORI	15:00 - 15:50	
	Presentation SHOYU	16:30 - 17:20	
	Presentation WAKAME	17:30 - 18:20	
	Apero / Clean Up	18:30	
	Assessment	19.00	
	Redesign of Process	20:00	
	Farewell Dinner	21:00 - open end	Restaurant Kurve

Course Dates	Event	
April 22, 2005 9:00 until 18:00	First Review (by Videoconference)	Home Universities
May 27, 2005 9:00 until 18:00	Second Review (by Videoconference)	Home Universities
.....	Arrival of students according to team decisions	
June 23 and **June 24, 2005**	CanPlus Final Presentations All teams, faculties, mentors jury, investors in Switzerland	POLE Spaces in Spinnery

Map of Brugg/Windisch



www.pole-europe.ch

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Imprint

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Layout
Gabriella a Marca, Zürich

March 2005
Print 250