

The Concepts of the Internationally Orientated Degree Course “Computer Science and Communications Engineering”

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Introduction

With funding of the German Federal Government and the assistance of the German Academic Exchange Service (DAAD), the Faculty of Electrical and Electronic Engineering of the Gerhard Mercator University of Duisburg offers a new internationally orientated degree course in Computer Science and Communications Engineering. The two most important facts in the concept of this degree course are the definition of a curriculum for a new and expanding field of engineering technology and its international dimension, as this degree course is aimed equally at German as well as foreign students.

Course Curriculum

The course curriculum focuses on the new media and communication technologies that have evolved over recent years through the fusion of computer science and information technology. Apart from the fundamentals of engineering, the basic study period (of four semesters) also covers the essentials of electrical engineering, information science and information theory that are needed to study this new field of knowledge. The major study period (of four semesters of lectures plus one semester for the thesis) then concentrates on the mandatory subjects of data processing, information technology and communication networks, while also offering the following electives for in-depth study:

Elective	Concerned with:
Data Processing and Information Technology	information processing, data storage and manipulation, data processing, software engineering, computer systems.
Communications Technology	information transfer, encryption, networks, equipment, systems.
Technical Electronics	technologies and components used in information and communications technology.

International Dimension

One of the most important facts is the interface between the German engineering education and other educational systems. First, this is implemented by the

choice of finishing the degree course with the German degree Diplom-Ingenieur (Dipl.-Ing.) or alternatively the internationally recognized Master of Science (M.Sc.). Secondly, required entrance qualifications for applicants from abroad are twofold:

- for the undergraduate (first semester): general or special university entrance qualification,
- for the postgraduate studies (fifth to seventh semester): Bachelor's degree in an appropriate subject area.

Especially latter regulation allows to place applicants already holding a degree into the right semester within the postgraduate studies, depending on the contents of their previous studies. In consequences, the structure of this degree course has two faces as shown in fig. 1, one of them is the classical structure of a German degree course in engineering (fig. 1 left side), the second one offers opportunities for foreign students to enter the degree course at several stages with regard to their former education and degree earned in their home country (fig. 1 right side).

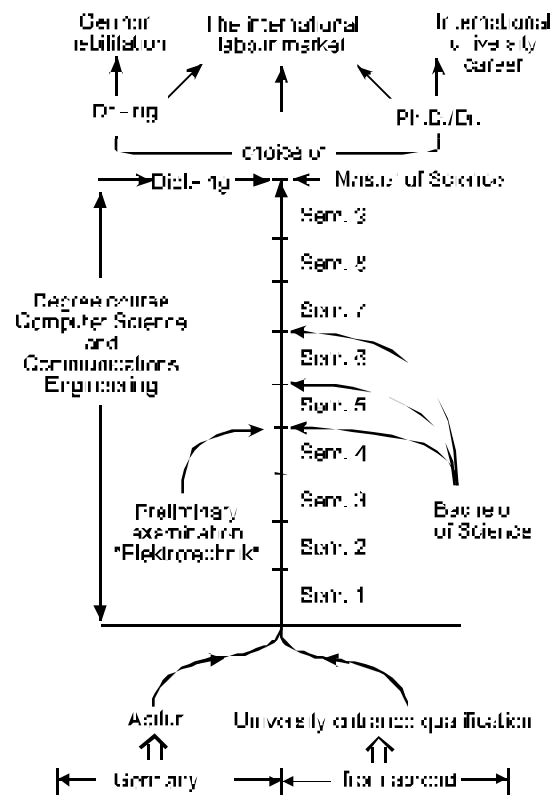


Fig.1: Integration of the Degree Course into the International System of Higher Education

As explained above, the degree course has been designed to serve two purposes. The first is to make it easier for foreign students to study at the Gerhard Mercator University of Duisburg. The second is concerned with providing German students with an opportunity to qualify themselves for the global labour market through the undermentioned, internationally orientated course components:

- English-language lectures during the course, also by guest lecturers also from the UK and the USA,
- language courses (German and English) for newcomers,
- at least one semester abroad for German students,
 - at universities to earn credits by lectures, examinations or a thesis,
 - in companies in order to complete a industrial practical training
- support for German students in organising their stay abroad,
- tutorials to support students and to integrate foreign students in a common degree course and

- studying in a multi-cultural environment.

Fig. 2 gives an overview on the flow of the technical contents and the assisting international dimensions of this degree course. Modern communication techniques like multimedia are not only subject of this degree course but also one way of teaching and distributing information in the frame of this degree course. This aspect is dealt with in [1]. In addition, this new technologies help to set up courses which can be offered specially for students who attend the course from different universities at different countries at the same time [2].

The results of the students during the degree course are accumulated by using a credit point system. This system allows the students to choose some of their subjects from the actual offer; more important, credit points can be used to include results from foreign universities into their studies at Duisburg. Hence, credit points assist the assessment of a given Bachelor degree during the process of placement; they also allow to include the results from examinations and theses gained during a stay abroad in the Dipl.-Ing./M.Sc. transcript of the students.

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Fig. 2: Overall Structure of the Degree Course

First results

Internationally orientated degree courses as the one described in this paper started just with winter semester 1997/98 for the first time ever at German universities. Therefore, results can only be given for the ongoing academic year and from the list of applicant for the following semester as given in fig. 3.

From fig. 3 it is evident that a reasonable amount of students from abroad take advantage of this offer. It can also be shown that the overall structure as given in fig. 2 is accepted: students choose the undergraduate studies and the postgraduate studies in about the same way. Therefore the integration of undergraduate and postgraduate studies within one Dipl.-Ing./M.Sc. degree course is suitable to and accepted by students from different countries and with different levels of education.

Career Prospects for an International Market Place

A new professional field concerned primarily with information and communication technology, networks and multimedial services has emerged in recent years. These new areas all promise high future growth rates and good prospects for job beginners as well as for diverse careers. Major players in this business are global companies as communications engineering is no longer only the task of connecting local computers but global economies. Therefore, companies from the old European countries will try and win their market shares all over the world. Students from abroad can

benefit from this development not only for their own career, but also in favor of their home countries in the sense that developing today means to communicate and exchange information.

This degree course will endeavour to equip students with the necessary technical expertise to enable work in these areas. The completion of course projects, dissertations and practical training all provide ample opportunity for team-orientated work on the latest in research and development. In addition to obtaining a specialist qualification, students will also be able to practice English and German language, and gain an insight into international cooperation and foreign cultures.

References

- 1) Hunger, A.; Werner, S. "A Course Curriculum and a Multimedia Concept for an internationally orientated Degree Course" in *Proceedings of the CATE '98* (Cancun/Mexico, 27.05.98-30.05.98), Page 25-28, IASTED/ACTA Press, ISBN 0-88986-258-3
- 2) Hunger, A.; Werner, S. "Possibilities and Limitations of a Computer Supported Cooperative Learning Environment within a Spatially Distributed Practical Training" In *Proceedings of the Euromedia '98*, (Leicester, UK, 5.1-6.1.98) SCS Publishing, ISBN 1-56555-140-0, 1998, pp. 235-237.

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Fig. 3: Statistic of Students Entering the Degree Course

(* The exact numbers of German students are not known as they apply directly at the students office)