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# Study Programmes for Collaboration with Foreign Partner Universities

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This paper reports on the recognition of studies abroad through the tripartite collaboration between the University of Siegen, Germany, the University of Portsmouth, Great Britain, and École Nationale d'Ingenieurs in Saint Etienne, France. The objective of the collaboration is to provide two diplomas by two institutions to those students taking part in a study programme common to the co-operating institutions. Further advancement of the common study programme between the three institutions will be outlined. It will also be explained how to extend this collaboration by overcoming the biggest handicap, that the desire of engineering students in England and France to study in Germany does not match the desire of German students to study abroad.

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## INTRODUCTION

The Faculty of Mechanical Engineering (Fachbereich Maschinentechnik) at the Universität-GH Siegen, Germany, has been involved, for many years, in several programmes with foreign partner universities. Arrangements include those with:

- The University of Portsmouth, Great Britain and the École Nationale d'Ingenieurs de Saint Etienne, France.
- The University of Bath, Great Britain and the IFMA in Clermond Ferrand, France.

This paper describes what is probably the most mature programme, the tripartite co-operation between the University of Portsmouth (UP), the École Nationale d'Ingenieurs de Saint Etienne (ENISE) and the Universität-GH Siegen (UGS). Possible future developments are also outlined.

## THE TRIPARTITE PROGRAMME

### History

Discussions on mutual co-operation between the ENISE in France and the UP in Great Britain began in 1971, with the UGS in Germany joining in discussions in 1972. Formal co-operative agreements were

signed in 1978, making 1998 the 20<sup>th</sup> anniversary! European Community funding was first obtained in 1979 and tripartite co-operation between the three institutions began in 1984, which have led to the establishment of equivalent study programmes, the awarding of double degrees, the provision of industrial training places for students and annual staff exchanges. The criteria applied in the development of the co-operation between the three institutions have been described in an earlier paper [1]. This paper considers some aspects of more recent developments.

### Present arrangements

At both the ENISE and UP, the regular courses in mechanical engineering consist of five academic years, including two semesters of supervised work experience (ie industrial training). On completing the course at ENISE the diplôme d'Ingenieur is obtained, with the degree of Master of Engineering (MEng) obtained at UP. The Diplom II course at the UGS (a university course) is a minimum of nine semesters of study with six months practical training before and during the course, and graduates are awarded the degree of Diplom-Ingenieur (Dipl-Ing).

Students from Siegen can select nearly any module from years two and three in Portsmouth, and those studying at Saint Etienne follow the complete fourth

year, including the obligatory half academic year of industrial work. In either case the German intermediate degree *Vordiplom* is a prerequisite, allowing German students to rely on an extensive catalogue of equivalent subjects developed during the past years of study. In consequence, students going to Portsmouth or Saint Etienne know exactly and clearly which subjects they will get credit for in Siegen. Of course, credits from other subjects can be transferred through an individual check by the examination board and the responsible professor as in former times. For several reasons, students from Siegen have not so far been awarded a British degree. However, by extending their stay at the ENISE to year five, some German students have qualified for the French Diplôme d'Ingenieur.

A prerequisite for British and French students studying in Siegen is the British BEng (Hons) or successful completion of year four at the ENISE respectively, and Siegen considers such students from the partner institutions to have completed semester seven of the German course. In earlier stages of the programme all previous exams from a student's home university were checked individually by the UGS. However, as the staff in Siegen became more familiar with the content and quality of the courses in Portsmouth and Saint Etienne, a simplified transfer of credit was accepted. For those students who wish to obtain the German degree *Diplom-Ingenieur* (DII), a special list of subjects, including two major projects (a *Studien* and the final *Diplomarbeit*), is mandatory, although there is a some degree of freedom. Thus a student from Portsmouth or Saint Etienne also knows clearly in advance what are the requirements for qualification with the German degree.

Presently the partner institutions are introducing the European Community Course Credit Transfer System (ECTS), which provides a way of measuring and comparing learning achievements, and transferring them from one institution to another. (The ECTS information package of the Faculty of Mechanical Engineering of the Universität-GH Siegen is, as an example, available in the Internet or can be obtained from the University administration [2][3]).

### Student numbers

During the last few years the number of students involved in the exchange programme has been quite stable. On average, ten students from UGS applied to attend UP per year, and two for ENISE. The ENISE usually accepts all applicants, the UP, for reasons of reciprocity, averages four. During the last few years, two British students from the UP and three French students from ENISE came to Siegen, and four of

them earned the German Dipl-Ing. In addition, all three partner institutions help students to find industrial training in a host country. This is important since British students often prefer to spend a year abroad not at the university but in a company.

Several additional observations are worth mentioning:

- The largest group of students interested in an exchange programme are the students from Siegen.
- The study programme in Portsmouth is very attractive although German students are rarely awarded a British degree. The number of German applications for a study programme in Portsmouth is much larger than the opportunities that Portsmouth is able to offer.
- Few students from the partner institutions selected the study programme at the UGS; however, nearly all of them qualified for the German degree.
- A previous industrial training in a host country is often followed by a study programme at the partner university of the host country.

### CONCLUSIONS AND FUTURE DEVELOPMENT OF THE STUDY PROGRAMME

The above mentioned observations may lead to the following conclusions:

- The further development of German engineering courses requires more English speaking institutions as partners. Because of reciprocity, British partners are not able to satisfy the German needs with respect to the number of students accepted.
- German universities must facilitate the attendance of foreign students in the German university system. Measures include improved language training, lectures in a foreign language, eg in English, and a more modularised study programme with a reliable schedule.
- Supervised work experience is an essential component of engineering courses in France and the UK. Industrial training in a foreign company is often the first step to entry into the study programme of the host university. Thus, future international courses must contain an integrated opportunity for industrial experience.
- The award of the degree by a host institution and, consequently, the achievement of a double degree is an important argument for foreign students in deciding whether to study abroad or not. Recent graduates with the degrees from both UGS and

YEAR	SEMESTER	COUNTRY	
5	10	Host	Thesis/Diplomarbeit in accordance with home/host university
	9	Home	22 h per week of technical lectures in advanced subjects
4	8	Host	Industrial* or scientific project + 28 h per week for one semester of technical lectures, tutorials and laboratories
	7	Host	
3	6	Host	Industrial placement along with a language training
	5	Home	28 h per week of lectures, tutorials, laboratories and language courses

German students with "Vordiplom" and foreign students with BSc from selected universities with agreed language qualification

without BSc

\* eventually based on industrial placement in semester 6

Figure 1: Possible joint curriculum in Mechanical Engineering with the award of an international double degree.

UP or ENISE respectively received more job offers than the regular student with only one degree. There is no doubt that double awards become more and more attractive to German students as well, particularly when they are achieved simultaneously and do not extend the length of the course that would have been followed had the students remained at home. Consequently, future international study programmes at universities should offer a double award as the standard certification.

- Presently, a new joint curriculum (see Figure 1) is being discussed by the partner institutions. One goal of this further development is to increase the participation rate, particularly in Siegen. Of course, such a joint curriculum will enhance the co-operation of all participating institutions.
- The German Federal and State Governments are aware of the importance of further internationalisation in higher education. However, the present discussion of Bachelors and Master's degrees is only one aspect. Without doubt there are very many other benefits for all who participate in the international exchange and take advantage of the opportunities they provide.

## REFERENCES

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## BIOGRAPHIES



Thomas Carolus was born in Frankfurt/Main, Germany, in 1954. He studied Mechanical Engineering at the Universität (TH) Karlsruhe, Germany and at the Georgia Institute of Technology, USA, and was awarded the degree of Master of Science in Mechanical Engineering by Georgia Institute of Technology in 1979, and the degree of Diplom-Ingenieur by Universität (TH) Karlsruhe in 1980. Between 1980 and 1986 he held a research position at the Universität (TH) Karlsruhe, and was awarded the degree of Dr-Ing in 1984.

Between 1986 and 1990 Dr Carolus was employed by the German company Robert Bosch GmbH. Since

1990 he has been Professor for Fluid Flow and Fluid Flow Machinery, Universität-GH Siegen, where he is now responsible for the ERASMUS/SOCRATES exchange programme of the Faculty of Mechanical Engineering



Klaus Detert was born in Berlin, Germany, in 1926. He studied at the Technical University of Berlin, Germany, and was awarded the degree of Diplom-Ingenieur in 1952, and the degree of Dr-Ing by the Institute of Physical Metallurgy, Technical University of Berlin, in 1954.

He has worked for Brown University, Providence RI, USA, as a Research Associate between 1954-1955; a scientist at Vacuumschmelze GmbH, Hanau Germany (affiliate of Siemens Corp) from 1955-58; as Chief Engineer at the Institute of Physical Metallurgy, Technical University of Berlin, from 1958-63, where he was awarded Dr-Ing habil in Physical Metallurgy in 1962.; Research Associate at R&D Centre Westinghouse Electric Corp, Pittsburgh Pa, USA from 1963-66; and Director of Materials Technology R&D Centre AEG Telefunken in Frankfurt/Main, Germany, from 1966-77. He was made Adjunct Professor at the Technical University as Appl. Prof. in Materials Science in 1969, and full Professor in the Faculty of Mechanical Engineering, University of Siegen, in 1977, becoming emeritus Professor in 1992.