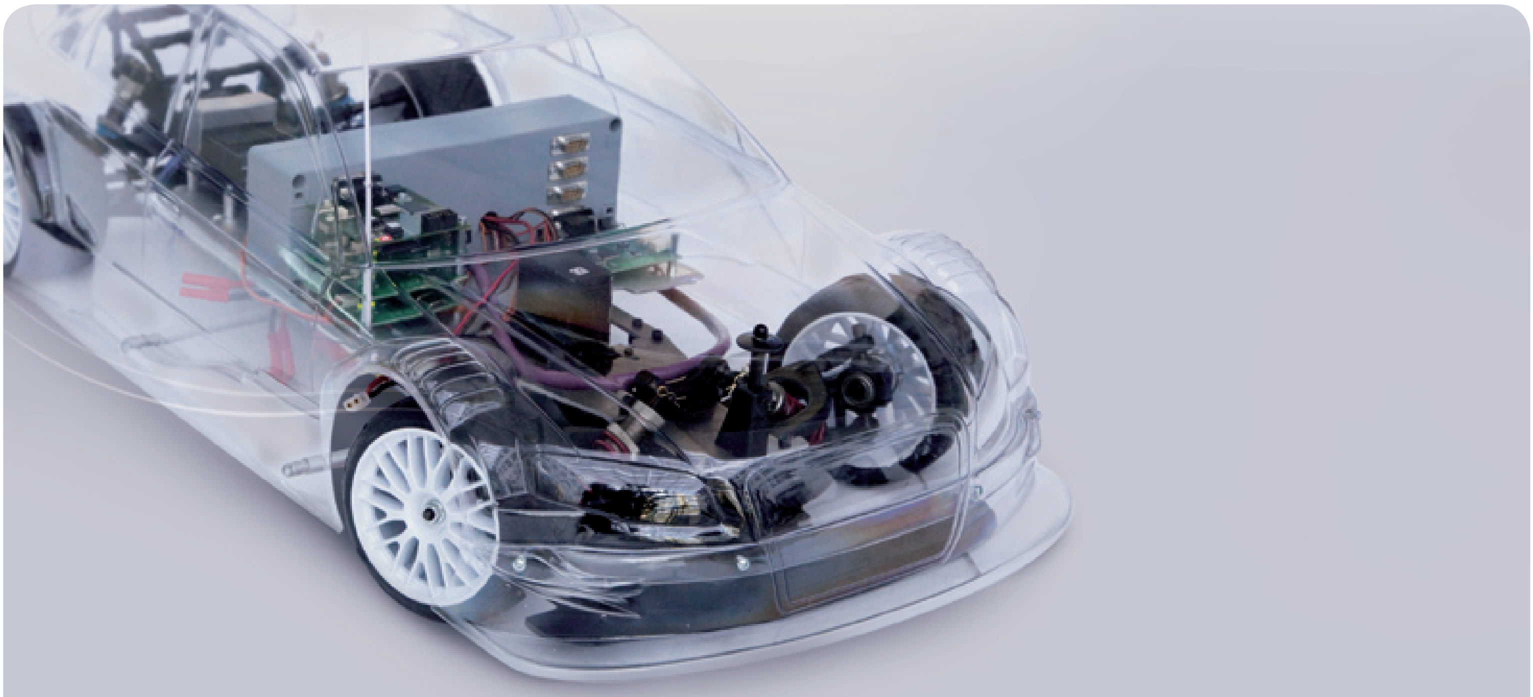
POSTGRADUATE DISTANCE STUDIES / SCIENCE & ENGINEERING

PROGRAM INFORMATION

SOFTWARE ENGINEERING FOR EMBEDDED SYSTEMS

DISTANCE EDUCATION PROGRAM

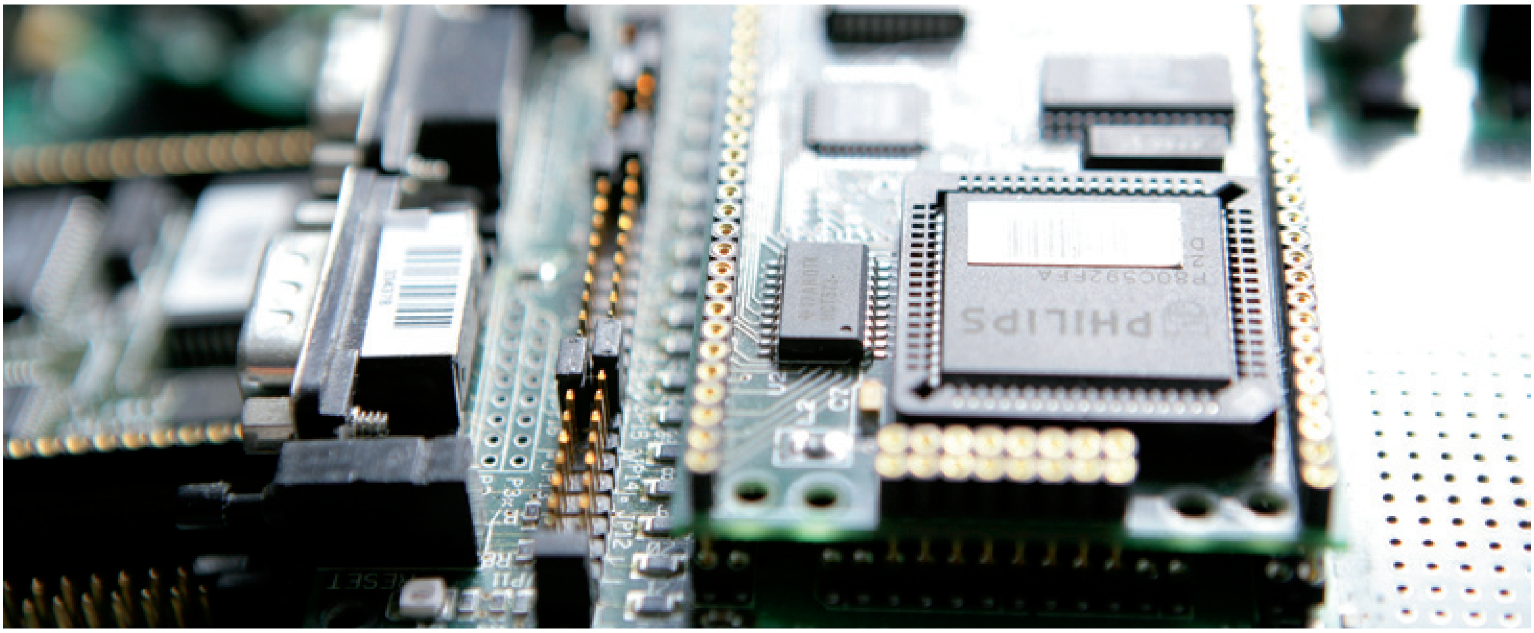


postgraduate
Distance studies

- FUNDAMENTAL SOFTWARE ENGINEERING PRINCIPLES
- PROJECT MANAGEMENT
- METRIC-BASED SOFTWARE PROCESS IMPROVEMENT
- SOFTWARE DEVELOPMENT FOR EMBEDDED SYSTEMS
- SOFTWARE QUALITY ASSURANCE FOR DEPENDABLE SYSTEMS
- KNOWLEDGE MANAGEMENT

DISTANCE AND INTERNATIONAL STUDIES CENTER

CONTENT



PREFACE

The aim of this guide is to answer the key questions that you may have in connection with the “Software Engineering for Embedded Systems” continuing distance education program, and to provide an overview of how the course is structured.

The first part of the guide comprises an overview of the administrative formalities associated with the course. In the subsequent sections, the course learning objectives, the course structure, and course contents are presented, together with more detailed information on the team of authors and the participating institutions.

The final part of this guide provides a brief introduction to the University of Kaiserslautern. We hope that reading this short guide will provide you with the information you need to confirm that our postgraduate study program is the best choice for you.

Prof. Dr. Dieter Rombach

Software Engineering Processes
and Measurement Research Group
University of Kaiserslautern

CHARACTERISTICS OF ADVANCED SCIENTIFIC STUDY

ADVANCED SCIENTIFIC STUDY

- requires the ability to pursue a course of study,
- presupposes experience in conducting scientific work,
- requires the student to confront different points of view,
- utilizes scientific language, which is not always easy for "outsiders" to understand at first,
- and therefore requires a willingness to reflect on and
- "tune in to" new forms of language and ways of thinking.

ADVANCED SCIENTIFIC STUDY DOES NOT PROVIDE

- instant recipes to be applied in the world of business practice,
- easily "consumable" knowledge.

The world of continuing education is composed of a huge number of courses offered. One way of categorizing them is to look at each course's target audience. Some courses do not stipulate any particular educational entry requirements. Anyone who is interested in tackling the program's contents can sign up for the course. Other course providers develop more specialized programs that are only relevant to a limited target group. Restriction may be based upon the fact that successful completion of the course requires a degree of prior knowledge, which the study program then develops further. "Advanced scientific study" falls precisely into this latter category. Although, in principle, nobody should be excluded from insights into the worlds of science and research, it is simply not possible to avoid having some specific, basic entry requirements. A willingness to engage in the language of science is one crucial prerequisite.

Other prerequisites include elementary, basic scientific knowledge in the subject area that forms the object of the advanced course. Without this degree of prior knowledge, it is impossible to properly participate in the course, since continuing education implies the act of taking learning one step further, rather than the act of acquiring basic knowledge as an introduction to a discipline.

It is important that you take these key points into account when making your decision, in order to avoid any disappointment, or even inadequate performance, that could subsequently cause you to abandon the course.

»Excellence in software engineering and technical skills are essential prerequisites for developing embedded systems. In addition to this, experience in project management is needed to make these competencies pay. This distance education program is a practical guide to project management as a whole and project management techniques in particular.«

Dr. Gerhard Pews (sd&m AG)

OBJECTIVES, STRUCTURE AND ORGANIZATION

OF THE DISTANCE EDUCATION PROGRAM

»Engineers for embedded systems need to master mechanics, electronics, and, increasingly, – software. In this course, experienced engineers will learn state-of-the-art software engineering for embedded systems.«

Prof. Dr. Dieter Rombach, Fraunhofer IESE

BACKGROUND AND DEMAND FOR THE PROGRAM

Software Engineering is concerned with the development of large and complex software-intensive systems in an economic and timely manner by following engineering principles and applying best practice methods, techniques, and tools. Software Engineering focuses on the specification of system structure and behavior, and on the implementation of these specifications; the activities required for assuring that the specifications have been met; and the development of such systems over space (distributed development, subcontracting) and time (evolution, maintenance). In most embedded systems domains (e.g., automotive), software is taking on a dominating role. Today, software and electronics already account for more than 40% of the overall costs. Applications are no longer limited to classical embedded control systems, such as airbag control software, but cover a broad range from mission critical embedded systems in the X-by-wire field to infotainment and intelligent driver assistance, complex medical control systems, and personalization in the Man Machine Interface area.

Today, traditionally hardware-dominated product domains are turning more and more into software dominated ones. Many of the companies and organizations in these transitional domains still employ mostly traditional engineers with limited basic education and training in software and software engineering. These companies face the challenge to transition experienced engineers to the software engineering domain. This transfer is anything but easy. The increasing software complexity, the rising demand for secure and high-quality software in embedded systems, and the constant change and stream of new software engineering methods, techniques, and tools demand that engineers from embedded system domains (e.g., automotive and military) receive professional education. As long as the situation continues unremedied, the enormous and continuously growing challenges provided by software will not be mastered adequately. The necessary education and training cannot be accomplished by company-internal programs, nor can companies afford to give lengthy leaves of absence to their experienced engineers.

This is the purpose behind the development of the four-semester distance education program “Software Engineering for Embedded Systems”, under the scientific direction of Prof. Dr. Dieter Rombach. The program will provide a sound theoretical background as well as practical methods, techniques, and tools that consider both management and software development issues:

- The program reflects the latest state-of-the-art in software engineering for embedded systems.
- International top experts of the software engineering domain share their knowledge and practical experience with the students by developing high-quality textbooks. The experts are either high-ranking researchers who are recognized in industry or professional leading engineers with profound knowledge in system engineering.
- Students will enhance their competitiveness in system engineering and will earn recognized degrees and certificates by enrolling in the course.
- The distance learning mode lets the students balance their job and their education and lets them decide when, where, how, and with whom they want to study.

PROGRAM OBJECTIVES

The overall goal of this distance education program is to provide the professional with a sound theoretical software engineering background as well as with practical methods, techniques, and tools that consider both management and software development issues. The program prepares the student for a career as a professional software engineer in industry. Students will acquire competencies in the following domains:

- Fundamentals – understand and apply fundamental principles and basic software engineering concepts across all software development phases for embedded systems.
- Software and systems engineering – understand the difference between software and systems engineering; become aware of the challenges and risks of developing software for embedded systems; understand the co-existence of software and hardware development; understand the issues in software-hardware co-design.
- Develop large-scale software – understand the challenges for and differences between software development in the small and software development in the large; learn how to systematically develop complex software by applying selected methods, techniques, and tools; be able to use specific tools, algorithms, architectures, components, and frameworks in order to develop a software solution; understand the importance of dependability and hence explicitly consider correctness, reliability, availability, performance, security, and safety as critical aspects of embedded software.
- Evaluate design and system – understand the importance of verification and validation; apply the most common V&V methods and techniques.
- Project management – understand and elicit the risks, estimate projects costs, and assure software quality by selecting the best available methods, techniques, and tools; understand the different roles in a software organization; organize and lead software development teams.
- Software process – understand, define, apply, and improve software processes based on reliable measurement data.
- Experience and knowledge management – package valuable lessons learned, models, processes, and software artifacts for later reuse and perform continuous process improvement.
- Team work and collaboration – work efficiently in teams in order to achieve common goals.
- Critical thinking and decision making – analyze, evaluate, and synthesize information, make the right decision, and develop appropriate solutions to solve problems.
- Communication – present and share information about software and systems, processes, and related knowledge in a variety of forms with selected description techniques in an effective way.
- Self-organized learning – be able to independently learn new methods, techniques, and tools as they evolve; serve as an agent of change for introducing new technologies; be able to assume responsibility for one's own continued professional development.

The aim of this distance education program is to convey a well-founded, wide-ranging basis of knowledge for developing, implementing, and evaluating software for embedded systems. In this way, the program graduates should find themselves in a position where they are able to assess the manifold interrelationships and effects of these new technologies. On this basis, they will have the ability to elaborate useful applications for their own institutions.

TARGET GROUP

The distance education program is designed for professionals working in the field of software development who need to acquire advanced knowledge of emerging technologies and who wish to broaden their software engineering skills by pursuing graduate level education in software engineering.

The program targets three kinds of graduates with a special emphasis on the first one: graduates of engineering disciplines such as electrical, mechanical and industrial engineering, graduates of IT disciplines such as computer science and business informatics, and graduates of non-engineering disciplines: mathematics and physics

ADVANTAGES OF DISTANCE LEARNING

The distance learning concept selected for the course offers a number of advantages. It allows you to combine your studies with your family and professional commitments, enabling you to work on the course anywhere, and at any time. You can study at home, in the office, or while you are on the move, and you have worldwide access to the Internet-based learning environment.

ADMISSION REQUIREMENTS

The admission requirements distinguish between work experience requirements and formal requirements:

Work experience:

- a minimum of two years of employment in software development
- ability to develop in a team
- ability to perform work on a graduate level (related to current degree)

FORMAL REQUIREMENTS:

- graduate degree in an engineering discipline: electrical, mechanical, or industrial engineering. Holders of industrial engineering degrees are only allowed to enroll in the management track. (see below for further information)
- or graduate degree in computer science or business information technology
- or graduate degree in physics or mathematics

OTHER REQUIREMENTS

To successfully participate in the distance learning course, you will be expected to have sufficient computer and Internet skills, as well as access to the corresponding technical resources. For example, this means that you should be capable of configuring your browser, conducting Internet searches, saving pages and graphics, creating and sending e-mails, adding attachments to e-mails, installing programs, downloading files, etc. Moreover, you should be capable of solving minor computer problems yourself. You should also have a smoothly functioning method for accessing the Internet. Any existing firewall may have to be adjusted to allow your Internet access to function properly. In addition to the technical requirements, you should also be willing to take part in online discussions and online group work.

STUDY TIME

It is estimated that approx. 14 hours of study time per week are required to tackle the program modules. This amount of time will be particularly crucial at the start of the course, since as a rule, it will take a certain amount of time in the early stages to find your personal working and learning style, and you will also need to accustom yourself to the program contents and the learning environment.

The actual study time required depends on a large number of different factors, such as your individual studying habits and practices and your personal and professional situation. It will also be necessary to “sacrifice” three blocks of two days each (Saturday to Sunday) to participate in the on-campus events. In addition, a studio module requires that you join a team of about five other students to develop software by applying the methods, techniques, and tools you have learned, or you will practice them by managing a software project. The projects are mentored by experts (i.e., either experts from the company you are from or external experts). These projects could be part of your company’s internal development projects (e.g., developing a prototype for a customer) or a software project at one of the IESE labs during two weeks (two times during the studies).

As you will no doubt realize, it is highly unlikely that you will be able to continue your previous activities, habits, and hobbies in the same unrestricted manner as before, particularly if you intend to properly complete the required course and examination work. We therefore strongly advise you to realistically assess your working capacity, your interests, and the time you have available to pursue the course, in order to avoid any unnecessary frustration at a later date.

COURSE LENGTH

The standard course length is two years (based on part-time studies).

ENROLLMENT

Course enrollment takes place over a period of several weeks (generally lasting until end of August).
To apply for enrollment please visit the site http://ecampus.zfuw.uni-kl.de/jsp/softing-anme.jsp.
Please send us a certified copy of your degree certificate or university qualification as proof that, upon admission, you will satisfy the entry requirements.

ACCREDITATION

The distance learning course is accreditated by ASIIN.

ASIIN e.V.
akkreditierter Studiengang

COSTS

The fee for the entire course is € 12,000. This covers the program-related costs (program contents, participation in online phases, on-campus events, etc.). This fee neither covers the costs of travel and accommodation, nor the university registration fee of 90 € per semester. In addition, participants have to pay a one-time Master examination fee in the amount of 500 €.

Payment is made at the start of each semester, i.e., in four installments of 3,000 €, with two installments payable at the end of each September and two installments payable at the beginning of each March. The examination fee has to be payed along with the registration to the Master thesis.

LEARNING ENVIRONMENT

The learning environment offers a multitude of functionalities. This is where you can find the program materials. The program contents of each module are available in a printable format and, if required, are supplemented by overviews, images, and links to examples or further materials. Furthermore, the program materials include tasks with problem-solving hints and tips, which are provided for you to do on a voluntary basis, with the aim of promoting more in-depth reflection and practice. In addition, the program materials feature a glossary, in which key terms from the respective program units are clarified.

The core of the learning environment is the communication area. This is where you will find the tools you need; e.g., the discussion forums for each study unit, and a seminar calendar. For social exchanges and discussions, students also occasionally meet up in chat rooms.

Within the framework of the learning environment, the participants can also create their own personal profile. This makes it possible to put faces to the discussion partners in the online phases, who will anyway often be familiar from the on-campus events.

In addition, the learning environment presents important, general information, such as the overall program structure, the schedule and contents of each program module, some basic rules of the game, communication tips, and information on the authors.

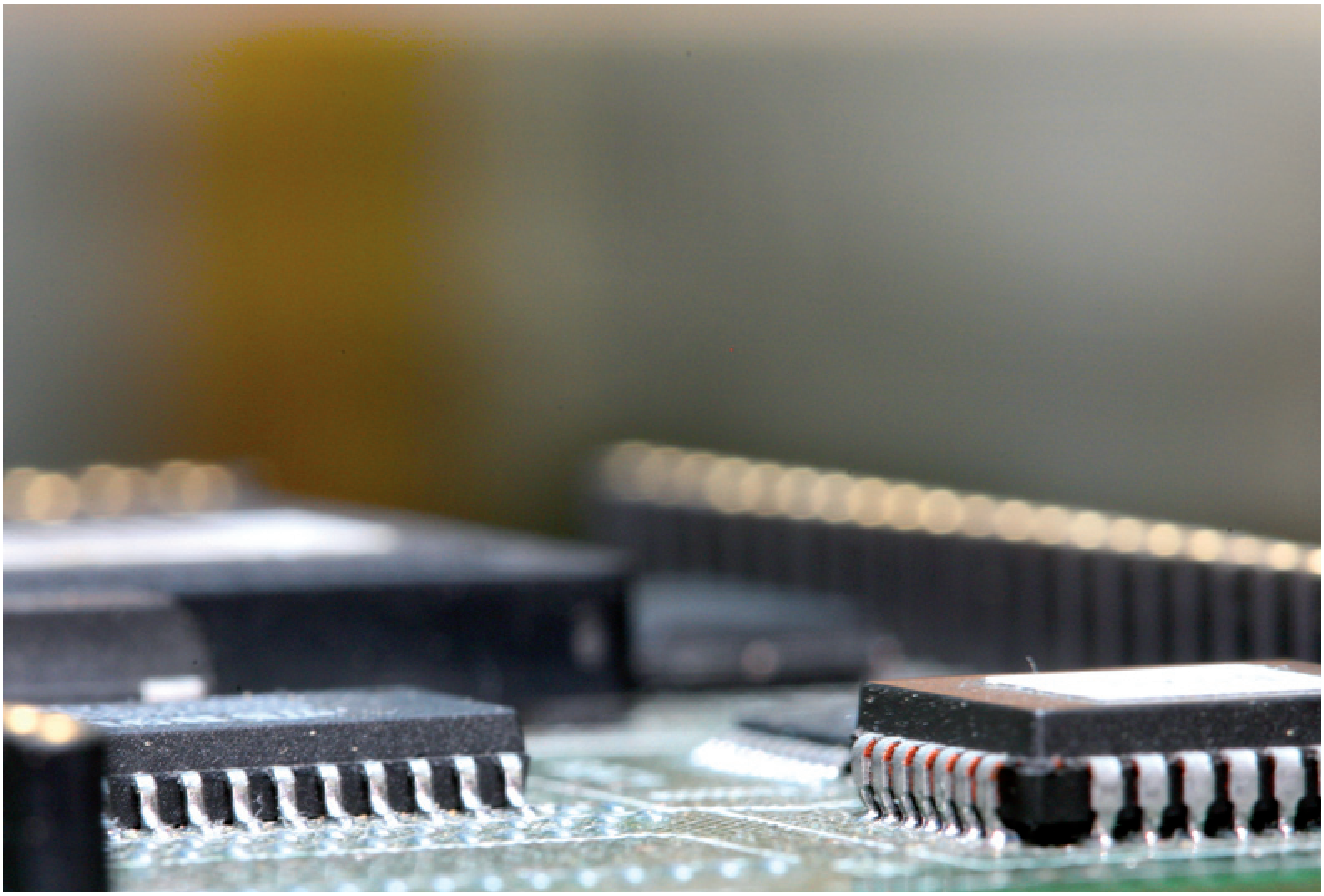
STUDY WORK

We expect all students to participate in the program on an active and regular basis. This means that you should visit the learning environment at least two or three times a week. Moreover, you will be expected to check your e-mails several times a week.

For some of the modules, the obligatory tasks set by the team of tutors must be completed within the stipulated period of time.

ON-CAMPUS PHASES AND STUDIO MODULES

Participation in the on-campus phases is another compulsory aspect of the program; the on-campus events are extremely important within the context of the online learning process. They are scheduled in a compact format (three two-day chunks, held on weekends) and are primarily intended to enable the participants to prepare for the exams, to get to know each other, to promote social and program-related exchanges, to get practical insights in one of the Fraunhofer IESE labs, and to provide an opportunity for taking tests.



In addition, in order to reinforce the learning content, the students must take part in a so-called studio during the second and third semester: You will join a team of about five students and develop software by applying the methods, techniques, and tools you have learned, or you will practice them by managing a software project. The projects are mentored by experts (e.g., experts from the company the students are from, experts from Fraunhofer IESE, or external experts). These projects could be part of the company's internal development projects (e.g., developing a prototype for a customer), which could run for several months, or a software project at one of the Fraunhofer IESE labs (a total of about four weeks full-time on campus).

CONTENTS

OF THE DISTANCE EDUCATION PROGRAM

»Developing complex software systems requires good development skills - and a lot of experience. Spreading knowledge and experience in a software development organization is crucial for success. The material covered in this course ranges from simple, light-weight techniques for daily use to reports on company-wide initiatives for experience and knowledge management. «

Prof. Dr. Kurt Schneider (Leibniz Universität Hannover)

ENGINEERING AND MANAGEMENT OPTION

The program primarily consists of self-learning phases and is supplemented by on-campus events.

First, you will engage in four fundamental course modules that will provide you with the basic knowledge in the domain of software development and project management for embedded systems. After that, you must either enroll in a more development-oriented software engineering program or in a more management-focused program. The engineering option is geared towards students who work more in the technical field of software development or who intend to change to more development related activities. The focus lies on requirements engineering, architectural design, and software development issues specific to real-time systems. The management option is suitable for students who are already involved in software project management and who want to extend their competencies, or for students who plan to manage bigger projects in the future. This option focuses especially on improvement of the software development process, configuration management, metric-based quality management, software economics, risk management, and experience- and knowledge management.

The decision about which option you want to enroll in can be made after the first semester.

CONTENTS OF THE DISTANCE EDUCATION PROGRAM

The core modules are the same for both options:

- Software Engineering Introduction
- Software Development for Embedded Systems
- Project Management
- Software Quality Assurance

The following technical engineering topics are covered:

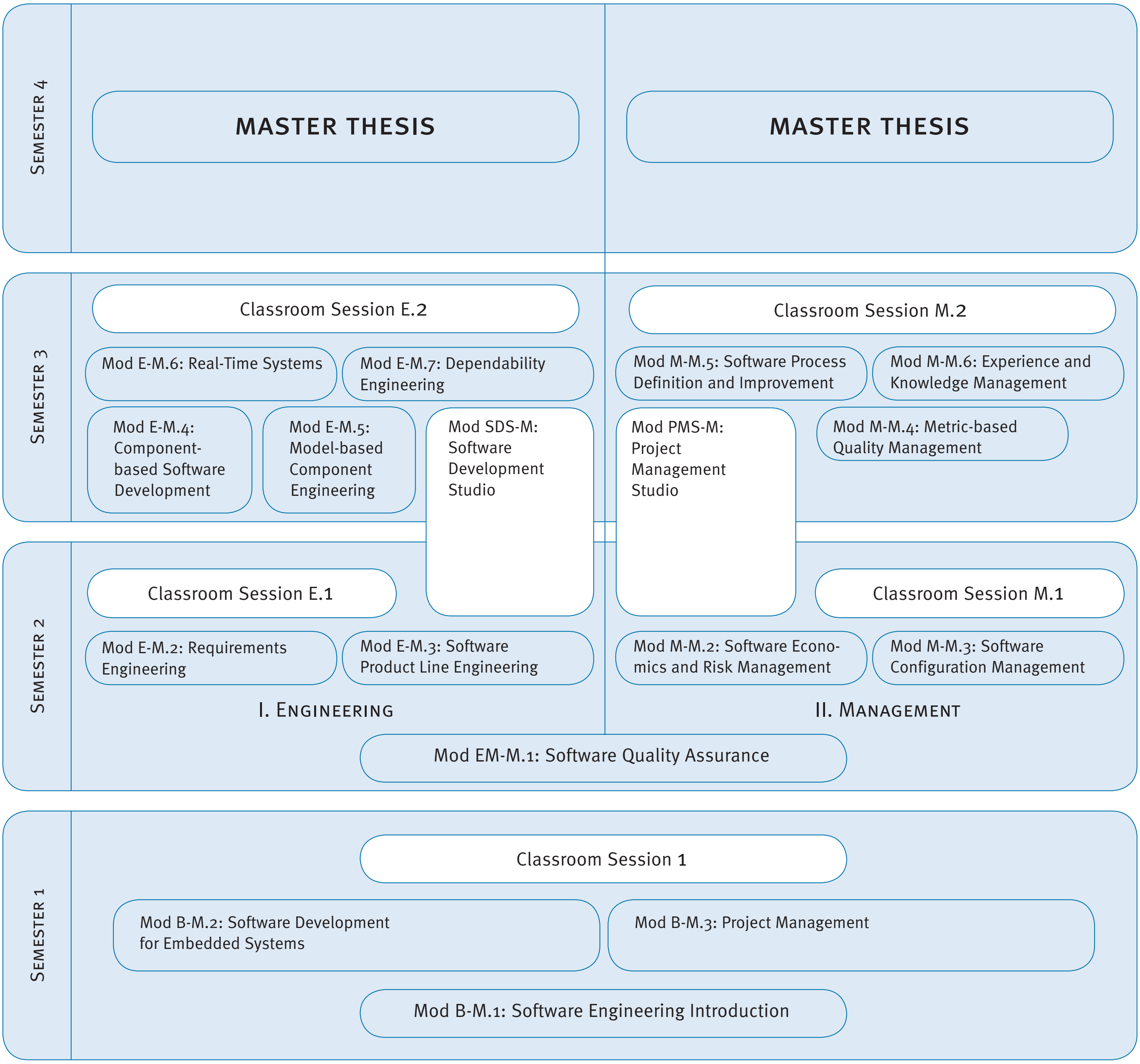
- Requirements Engineering
- Software Product Line Engineering
- Component-based Software Development
- Model-based Component Engineering
- Real-Time Systems
- Dependability Engineering

The following management topics are covered:

- Software Economics and Risk Management
- Software Configuration Management
- Metric-based Quality Management
- Software Process Definition and Improvement
- Experience and Knowledge Management

TIME SCHEDULE AND PROGRAM OPTIONS

The following diagram shows an overview and the time schedule of the program:



»Software Engineering is about the development of large complex software systems in which many engineers participate. In this distance education program, the students will learn how to manage complex structures and development processes, and how to achieve coordination and concurrent development.«

Prof. Dr. Ivica Crnkovic (Mälardalen University Sweden, School of Innovation, Design and Engineering, Mälardalen Real-time Research Centre)

CONTENT OF SOME STUDY TEXTS

Below, you will find examples of the kind of topics that will be covered by some of the modules.

REQUIREMENTS ENGINEERING

- Main activities and actors in requirements engineering
- Embedding the requirements engineering process into the overall software development process
- Documenting requirements by describing goals, scenarios, and solution-oriented artifacts
- Functional and non-functional requirements
- Requirements elicitation and analysis
- Requirements negotiation
- Requirements validation and verification
- Templates, tools, and the role of requirements engineering in process assessments

SOFTWARE QUALITY ASSURANCE

- Definition of quality assurance related terms
- Classification of test, analysis, and verification techniques
- Dynamic testing and static analysis
- Formal techniques such as symbolic testing and formal verification
- Function-oriented and control-flow testing
- Data-flow testing
- Tool-supported static code analysis
- Software inspections and reviews

SOFTWARE PRODUCT LINE ENGINEERING

- Definition of the terms product lines, product families, and product line engineering
- Product line life cycle in organizations
- Product line scoping as a process of specifying requirements for a product line infrastructure
- The impact of the product line engineering paradigm on the organization
- Reuse infrastructures
- Analyzing the economics behind product line engineering
- Incremental migration strategies for product line engineering
- Product line architectures and their specific properties such as flexibility and reusability
- Avoiding pitfalls in defining reusable components with product line concepts
- Designing components with respect to their variabilities

METRIC-BASED QUALITY MANAGEMENT

- Introduction to measurement, scales, maturity levels, etc.
- Goal-oriented measurement and the Goal Question Metric (GQM) approach
- Using measurement to manage projects and processes
- Using measurement to manage processes by using the Quality Improvement Paradigm (QIP)
- Measuring acquisition projects and business goals and integrating them with lower-level division and project goals
- Building a measurement organization to sustain and evolve measurement by using the experience factory approach

EXPERIENCE AND KNOWLEDGE MANAGEMENT

- Terminologies: data, information, knowledge - and beyond
- Fundamental concepts of knowledge management and success criteria
- Structuring and representing knowledge for reuse
- Reasoning and inference techniques
- Advanced approaches to organizational learning
- Experience and knowledge management in practice: approaches and tools
- Integration of knowledge and experience management solutions into existing infrastructures

AUTHORS

Leading international experts from industry sources and research institutes have taken on responsibility for the quality of the program contents. These include:

PROF. DR. DIETER ROMBACH

Software Engineering Introduction

University of Kaiserslautern
Faculty of Computer Science
Software Engineering Processes and Measurement Research Group
http://wwwagse.informatik.uni-kl.de/staff/rombach

PROF. DR.-ING. NORBERT WEHN

Software Engineering Introduction

University of Kaiserslautern
Faculty of Electrical and Computer Engineering
Microelectronic Systems Design Research Group
http://ems.eit.uni-kl.de/

DR. GERHARD PEWS

Project Management

sd&m AG
http://www.sdm.de/

PROF. DR.-ING. PETER LIGGESMEYER

Software Quality Assurance

University of Kaiserslautern
Faculty of Computer Science
Software Engineering Research Group
http://agde.informatik.uni-kl.de/staff/liggesmeyer

DR. DIRK MUTHIG

Software Product Line Engineering

Lufthansa Systems AG
http://www.lhsystems.de/

PROF. DR. HANS HANSSON

Real-time Systems

Mälardalen University Sweden
School of Innovation, Design and Engineering
http://www.mrtc.mdh.se/han/

PROF. DR. ARND POETZSCH-HEFFTER

Component-based Software Development

University of Kaiserslautern
Faculty of Computer Science
Software Technology Research Group
http://softech.informatik.uni-kl.de/twiki/bin/view/Homepage/PoetzschHeffter

DR. MARIO TRAPP

Model-based Component Enigineering

Fraunhofer IESE
Model-based Component Engineering, Fraunhofer IESE – Division Software Development
http://www.iese.fraunhofer.de/fhg/iese/research/development/software_development.jsp

PROF. DR. JOHN KNIGHT

Dependability Engineering

University of Virginia
Department of Computer Science
http://www.cs.virginia.edu/~jck/

DR. RICHARD W. SELBY

Software Economics and Risk Management

Northrop Grumman and University of Southern California

PROF. DR. VICTOR BASILI

Metric-based Quality Management

University of Maryland
Computer Science Department
Institute for Advanced Computer Studies
http://www.cs.umd.edu/users/basili/

PROF. DR. IVICA CRNKOVIC

Software Configuration Management

Mälardalen University Sweden
School of Innovation, Design and Engineering, Mälardalen Real-time Research Centre
http://www.idt.mdh.se/~icc/

DR. JÜRGEN MÜNCH

Software Process Definition and Improvement

Fraunhofer IESE – Division Quality Management
http://www.iese.fraunhofer.de/fhg/iese/research/quality/quality_management.jsp

PROF. DR. KURT SCHNEIDER

Experience and Knowledge Management

Leibniz Universität Hannover
Faculty of Electrical Engineering and Computer Science
http://www.se.uni-hannover.de/fachgebiet/kschneider.php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PARTICIPATING INSTITUTIONS

»At present, high software quality at reasonable costs is clearly a necessary precondition for business success. Thus, software quality assurance is an important topic within this masters program.«

Prof. Dr. Peter Liggesmeyer (University of Kaiserslautern)

Technical, subject-related direction of the distance education program is the responsibility of Prof. Dr. Dieter Rombach. He is head of the Software Engineering Processes and Measurement Research Group (AGSE) at the University of Kaiserslautern's Computer Science faculty. He is also Executive Director of the Fraunhofer Institute for Experimental Software Engineering (IESE). Effective 1 January 2003, Prof. Rombach was appointed Fellow of the American Institute of Electrical and Electronics Engineers (IEEE) in recognition of his achievements in the area of Experimental Software Engineering.

The program is being planned by the Distance and International Studies Center (DISC) of the University of Kaiserslautern and Fraunhofer IESE. The program is organized and run by DISC. The following section provides more detailed information on the institutions.

DEPARTMENT OF COMPUTER SCIENCE AT THE UNIVERSITY OF KAISERSLAUTERN

The university is home to about 10,100 students. Its focus on technical and science education is underlined by a strong cluster of affiliated research institutes in an adjacent science park. The university reflects a special profile and orientation towards applied research, which is emphasized by a number of highly prestigious centers of excellence and well established cooperation with international and German industries. Its highly qualified and motivated faculty attracts talented students from all over the world, which creates an international and multicultural teaching and research environment. The university has an inviting modern campus located in the Palatine Forest (UNESCO Biosphere Reserve). Kaiserslautern is famous for its soccer team "Red Devils" and was selected as one of the official venues for the 2006 FIFA World Cup. The city's unique mixture of high tech and unspoiled nature, history and modernity makes for an international but still typical traditional German city. The Computer Science Department is very active in research and education. There are currently 24 groups covering the entire spectrum of research topics, focusing particularly on:

› Information and Communication Systems

› System and Software Engineering

› Knowledge-based and Multimedia Systems.

FRAUNHOFER INSTITUTE FOR EXPERIMENTAL SOFTWARE ENGINEERING (IESE)

Fraunhofer IESE in Kaiserslautern currently has 200 employees who perform research in the areas of software development, software quality management, and software competence management. Together with its sister institute in the USA, Fraunhofer IESE offers processes, methods, and techniques for developing software-based systems according to engineering-style principles. In doing so, it follows an empirical approach: Through proven, innovative solutions, products based on software can be brought to the market with a measurably higher degree of efficiency.

The customers of Fraunhofer IESE come from domains where products are dominated by software: automotive and transportation systems, telecommunications, telematics and service providers, medical systems, as well as information systems and applications in the public sector. The institute provides support to companies of any size – from international corporations to small and medium-sized enterprises. The public sector also plays an important role as a project partner.

Fraunhofer IESE, which was founded in 1996, is directed by Prof. Dieter Rombach and Prof. Peter Liggesmeyer. It is one of 58 institutes of the Fraunhofer-Gesellschaft, which, as the largest applied research organization in Europe, contributes to national and international competitiveness. Since the founding of the institute, a close relationship between Fraunhofer IESE and the University of Kaiserslautern has existed in both academia and research. As assistant lecturers, employees of the institute contribute to the high level of practice-oriented education in the Department of Computer Science. The area of Software Engineering, represented until recently by the working group of Prof. Dr. Dieter Rombach, was further expanded with the new working group “Software Engineering: Dependability” led by Prof. Dr. Peter Liggesmeyer. In joint projects with third-party funds, the basic research of the Department of Computer Science and the applied research of Fraunhofer IESE complement each other ideally.

FRAUNHOFER ACADEMY

In 2005 the Fraunhofer Academy was established as a central unit to support Fraunhofer institutes in offering advanced training programs. With our range of training and development courses, we seek to contribute to the creation of a new innovation culture in Germany and Europe. Especially in-service online Master programs like IESE‘s “Software Engineering for Embedded Systems” are perfectly suited to create new opportunities for software professionals. In cooperation with our partner DISC, we will try to provide a program that provides best-in-class theoretical and practical aspects of software engineering. Further information can be found at www.technology-academy.fraunhofer.de.

DISTANCE AND INTERNATIONAL STUDIES CENTER (DISC) OF THE UNIVERSITY OF KAISERSLAUTERN

The Distance and International Studies Center is one of the University of Kaiserslautern‘s key scientific institutions. Its tasks comprise the initiation and development of further qualifications for university graduates who have already obtained an initial professional qualification. The range of measures that are offered in collaboration with the University‘s departments and subject areas comprise program, program sequences, and study programs of varying lengths. One of the Center‘s key focal points is the provision of distance learning programs, which can be taken on a part-time basis while pursuing a career. More than 3,500 students are currently enrolled in the distance learning programs of Adult Education, Human Resource Management, School Management, Medical Physics and Technology, Management of Health and Welfare Facilities, Economics and Management, Business Law, Sustainable Development Cooperation, Systemic Management , Software Engineering, Structural Fire Protection/Safety Engineering and Nanobiotechnology.

The Managing Director of the Distance and International Studies Center is Dr. Burkhard Lehmann.

THE UNIVERSITY OF KAISERSLAUTERN

HISTORY

The University of Kaiserslautern was founded on July 13, 1970. At the beginning, it was part of the twin University Trier / Kaiserslautern. In the winter semester 1970 / 1971, student and scientific activities started with the matriculation of 191 new students in the faculties of Mathematics, Physics, and Technology. In 1972, the set-up of the faculties Chemistry and Biology gave a boost to the extension of a scientifically specialized structure. At the same time, the faculty of Technology was split into the faculties Mechanical Engineering and Electrical Engineering, Architecture / Regional and Environmental Planning / Educational Sciences. The University of Kaiserslautern became independent after the separation from its partner University Trier in 1975. The following faculties, which were established successively, continuously strengthened the University's scientific character: Electrical Engineering (1975), later Electrical and Computer Engineering (1999), Computer Science (1975), Engineering (1975), later Mechanical and Process Engineering (1995), Architecture / Regional and Environmental Planning / Civil Engineering (1978-1979) and Social and Economic Studies (1985), which was separated in 2003 in two independent departments. The official name of the University is "Technische Universität Kaiserslautern" according to the new law on Higher Education of the Land Rhineland Palatinate, which came into force on September 1, 2003.

STUDIES AND PROSPECTS

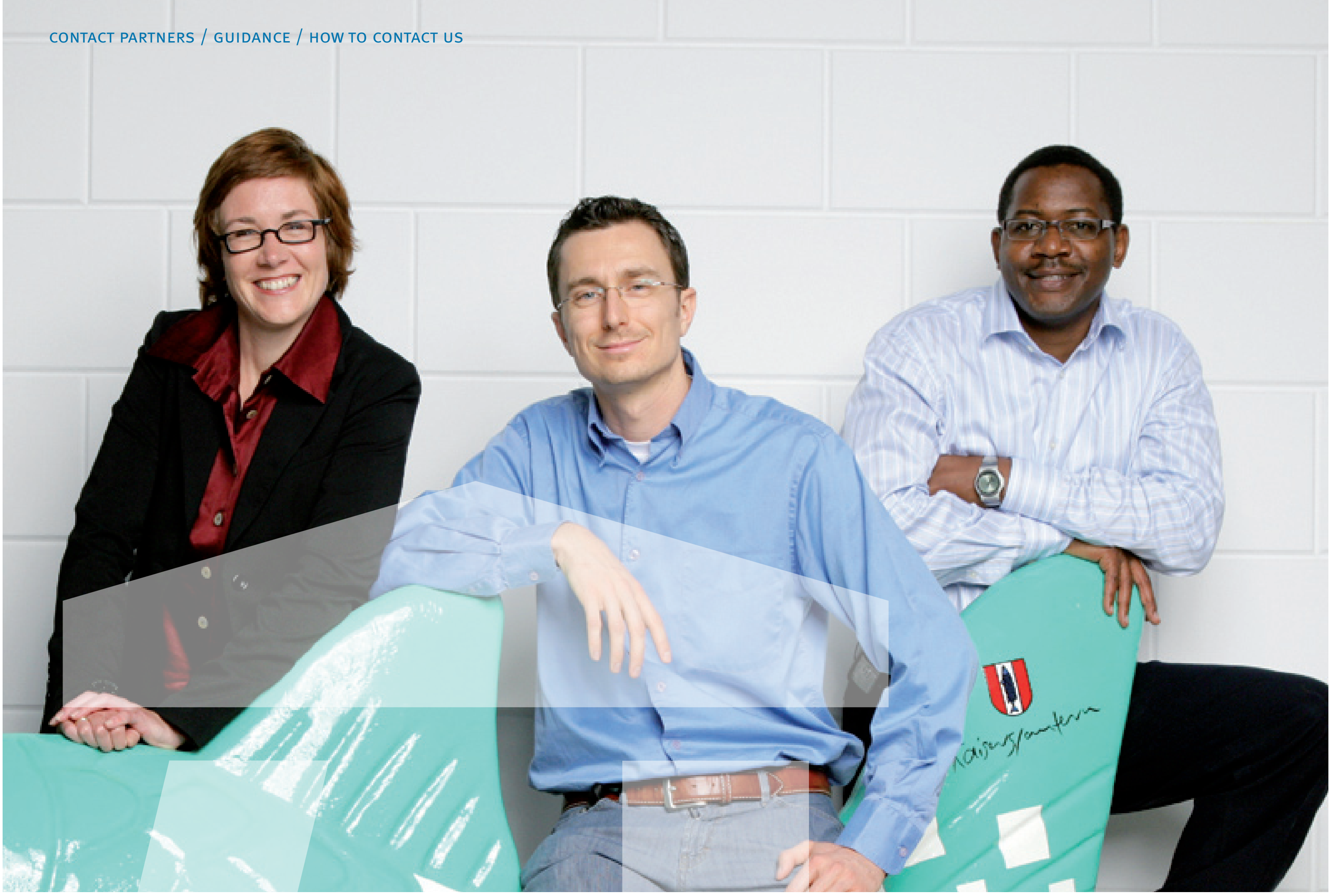
Future-oriented programs, education with practical orientation, and a modern infrastructure: these are the conditions for students at the University of Kaiserslautern. Since its establishment in 1970, the only technology- and natural science-oriented university in Rhineland-Palatinate has gained a considerable reputation and can easily stand comparison with well-established universities of technology. Incontestable proof is provided by the latest German university rankings, which were carried out by the magazines Stern, Spiegel and CHE "Centrum für Hochschulentwicklung" (Center for University Development) and the "Humboldt-Stiftung" (Humboldt foundation). The University of Kaiserslautern achieved top positions in different categories.

Prospective engineers and natural scientists will be well prepared for their career if they study at the University of Kaiserslautern. Internships in companies as well as living / studying abroad provide an academic education that is closely related to professional practice. Furthermore, students profit from the numerous well-known research institutes on and near campus. In terms of applied research projects, the institutes closely cooperate with the University. There are, for example, the "Deutsches Forschungszentrum für künstliche Intelligenz" (German Research Center for Artificial Intelligence), the "Institut für Verbundwerkstoffe" (Institute for Composite Materials), the "Fraunhofer-Institut für Experimentelles Software Engineering" (Fraunhofer Institute for Experimental Software Engineering), and the "Fraunhofer-Institut für Techno- und Wirtschaftsmathematik" (Fraunhofer Institute for Technical and Industrial Mathematics).

Currently, there are approximately 10,100 students enrolled at the university. Due to this manageable size, excellent support is guaranteed and a close relationship between professor and student can be built up. In addition, the university offers very modern equipment and a brilliant infrastructure, including libraries, laboratories, its own computer center, and much more. Accommodation for students is satisfactory, too: near the campus, there are more than 2000 resident hall facilities, where students can use the Internet free of charge.

The campus of the University of Kaiserslautern is idyllically located near a forest and has much more to offer than just an excellent education. University sports offer a wide range of activities and excursions and are therefore an important part of leisure activities. In the evenings, the cultural atmosphere on campus is livened up by concerts, shows, films, and exhibitions. Everybody can enjoy their hobbies in the numerous student work groups, such as astronomy, photography, or stock exchange games. The leisure time activities at the University of Kaiserslautern are complemented by the Summer Festival, the Welcome Party for new students, and the famous Old Town Festival (Altstadtfest). By the way, Kaiserslautern was also one of the venues for the Soccer World Cup 2006.

Thomas Jung, Dipl.-Volkswirt
PR + Marketing for the University of Kaiserslautern


Kaiserslautern

CONTACT PARTNERS/GUIDANCE
HOW TO CONTACT US

The staff of DISC and Fraunhofer IESE will be pleased to help you with any questions relating to

- how the program is structured
- costs
- dates and schedule
- on-campus phases, etc.

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