



**TECHNISCHE UNIVERSITÄT  
CHEMNITZ**

**SOCRATES**



**ECTS**  
EUROPEAN CREDIT  
TRANSFER SYSTEM



**INFORMATION PACKAGE 2003**

Faculty of Computer Science  
Applied Computer Science Studies







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## **I. General Introduction**

This information package describes the Chemnitz University of Technology and the courses offered by its Faculty of Computer Science in order to help prospective ECTS students to prepare for his/her study period at this institution. All given information represents the current state, changes are always possible.

Further information can be obtained under [www.tu-chemnitz.de/international/nach-chemnitz](http://www.tu-chemnitz.de/international/nach-chemnitz).

### **A. What Is ECTS?**

ECTS, the European Credit Transfer System, was developed by the European Community in order to provide common procedures to be followed in all EC countries to evaluate academic qualifications and to guarantee their recognition abroad. It provides a method for measuring and comparing learning achievement and transferring credits from one institution to another.

ECTS is based on the principle of mutual trust and understanding between the participating institutions of higher education. The few rules of ECTS, which concern a scope of information to be provided on available courses, the conditions for agreement between the home and host institutions and the use of credit points to indicate the workload of students, are designed to reinforce this mutual trust and understanding. Each ECTS department provides information about the courses it offers in terms of content as well as by assigning credits to each of them.

### **B. The ECTS Credits**

ECTS credits are numerical values allocated to course units to measure the student's workload required to complete these. They reflect the quantity of work which each course unit requires in relation to the total quantity of work necessary to complete a full year of academic study at the institution, including lectures, practical work, seminars, tutorials, field work, private work - in the library or at home - and examinations or other assessment activities. ECTS credits reflect a relative value of student's workload.

In ECTS, 60 credits represent the workload of one academic year of study and usually 30 credits are given for a semester (6 months). It is important that no special courses are set up for ECTS purposes, but that all ECTS courses are mainstream courses of the participating institutions, as followed by the local students.

It is up to the participating institutions to subdivide the credits for the different courses. Laboratory work and optional courses which form an integral part of the course of study also receive academic credit. Laboratory sessions and optional courses which do not form an integral part of the course of study do not receive academic credit.

Credits are awarded only when the courses have been completed and all required exams have been taken successfully.

### **C. ECTS Students**

Students participating in ECTS will receive full credits for all academic work successfully carried out at any of the ECTS partner institutions, and they will be able to transfer these academic credits from one participating institution to another as long as there is agreement between the institutions involved. All students of the participating faculties who would like to take part in ECTS may do so if their institution agrees.

Most students participating in ECTS will study at one host institution in an EC Member State or EFTA country for a limited period and then return to their home institution. Some may decide to stay at the

host institution and finish their degree there. Some may also decide to proceed to a third institution to continue their studies there. In each case, students are required to comply with the legal and institutional requirements of the country and institution where they graduate.

Students can continue their studies at their home institution with no loss of time or credit once they have successfully completed the study programme previously agreed between the home and host institutions. On the other hand, if a student decides to stay at the host institution and to complete her or his degree, she or he may have to adapt his or her studies due to the legal, institutional and departmental rules of the host country, institution and faculty.

For further details on ECTS, please consult the ECTS Brochure which is available from:  
ECTS Department, Erasmus Bureau, Rue Montoyer 70, B-1040 Brussels, Belgium  
phone: (+32)-2-233 01 11; fax.: (+32)-2-233 01 50

#### **D. Participating Institutions**

The following universities are our partners within the SOCRATES / ERASMUS programme in the field of Computer Science.

- |           |                                      |
|-----------|--------------------------------------|
| <b>A</b>  | Johannes Kepler Universität Linz     |
| <b>CZ</b> | České vysoké učení technické v Praze |
| <b>F</b>  | Université de Poitiers               |
| <b>NL</b> | Katholieke Universiteit Nijmegen     |

## **II. GENERAL INFORMATION ABOUT THE UNIVERSITY**

### **A. Institution**

Chemnitz University of Technology - Technische Universität Chemnitz / Germany

- Straße der Nationen 62                      phone: (+49)-(0)371-531-1303    fax: (+49)-(0)371- 531-1868  
D - 09107 Chemnitz                      **Internet:** [www.tu-chemnitz.de](http://www.tu-chemnitz.de)

There is a map of the campus at the beginning of the package, which provides more information about the locations of different university buildings, see page 4.

### **B: Admission Procedure**

Students who wish to take part in the ECTS programme at Chemnitz University of Technology should contact the ECTS coordinator of their home university.

Application forms are available either from the ECTS coordinator of the relevant faculty or from the International Students' Office (IUK). Application deadlines are always at the beginning of each semester.

The academic year consists of a winter semester (October to March) and a summer semester (April to September). Each semester includes a 15-week period of formal coursework and 3-week examination period. In addition, several weeks are set aside for scientific work.

The exact dates for each semester are available from the International Students' Office.

1. International Students' Office	<b>Internationales Universitätskolleg (IUK)</b> (registration / Foreign Students' Office)
2. Students' Service Office	Studentensekretariat (Registrar's Office)
3. Residents' Registration Office	Einwohnermeldeamt
4. Foreigner's Registration Office	Ausländerbehörde (Alien registration authority)
4. ECTS Coordinators	

### **C. Reception - Registration**

Upon arrival, the following institutions should be contacted:

#### **1. International Students' Office**

- Straße der Nationen 62 / Room 003+004                      phone: (+49)-(0)371-531-1303  
D-09107 Chemnitz                      fax: (+49)-(0)371-531-1868  
- contact:                      Frau E. Auerbach  
- office hours:                      Mon, Tue, Thu 9.00-12.00 a.m.

The "Application for University Admissions" or the reservation for it must be handed in at the International Students' Office as soon as possible. The following documents must be submitted:

- a. identification documents;
- b. 1 passport photo;
- c. registration certificate from the home university (Student Identity Card);
- d. "Application for University Admission" (Antrag auf Zulassung zum Studium)
- e. a written statement from the home university, indicating that the student receives a grant from the EC and giving the amount of the grant
- f. a certified copy of the secondary school diploma (qualification for university entrance)

including an official transcript (indicating all completed subjects and grades) and the certified translations in German or English.

If the student does not have such a secondary school diploma he or she must take an assessment test ("Feststellungsprüfung").

- g. an official copy of a certificate indicating the student's level of German proficiency. (see page 15 - language courses).
- h. proof of payment for the semester fee

## 2. Students' Service Office

- Straße der Nationen 62 / Room 042                      phone: (0371) 531-1634, -1635  
D-09107 Chemnitz    fax: (0371) 531-1300
  - office hours: Mon-Wed 8.30-11.00 a.m. and 12.30-3 p.m., Thu from 12.30 - 5 p.m
- Here you will receive your Student Identity Card.

## 3. Residents' Registration Office

- Elsasser Straße 8  
D-09120 Chemnitz

All students have to register with the police. The following documents are required:

- a. identity papers or passport
- b. a tenancy agreement

## 4. Foreigners' Office: Registering with the civil authorities

- Elsasser Straße 8                      phone: (0371) 488-3243  
09120 Chemnitz
- office hours: Mon, Tue, Wed, Fri: 8.30-12.00 a.m. and Thu. 2.00-6.00 p.m.

Upon registration at the University students have to register at the foreigners' registration office and should bring the following documents:

- a. identity papers or passport;
- b. a certificate of the ECTS grant;
- c. proof of registration at the Chemnitz University of Technology.

## 5. ECTS-Coordinator

The institutional ECTS coordinator is

**Prof. Dr. Rainhart Lang**  
**phone (0371)-531-4152, fax (0371)-531-3987.**

In addition, each faculty has its own ECTS coordinator, i.e. an academic adviser who coordinates all the ECTS activities within his or her faculty. The student may contact the adviser for information about courses, timetables, student organizations, etc. In some departments, the coordinator is assisted by an (administrative) ECTS contact person.

The ECTS coordinators and contact persons are:

- Faculty of Electrical Engineering                      **Dr. Wolfgang Seckel**  
and Information Technology:                      Reichenhainer Str. 70; Room 339p  
phone (0371) 531-3261  
fax (0371) 531-3131
- Faculty of Computer Science:                      **Prof. Dr. Hanno Lefmann**  
Str. der Nationen 62; Room 347  
phone (0371) 531-1276  
fax (0371) 531-1810

- Faculty of Mechanical and  
Process Engineering:

**Prof. Dr. Michael Dietzsch**  
Reichenhainer Str. 70; Room A7  
phone (0371) 531-2202  
fax (0371) 531-2201

- Faculty of Economics and  
Business Administration:

**Prof. Dr. Rainhart Lang**  
Reichenhainer Str. 39; Room 613  
phone (0371) 531-4152  
fax (0371) 531-3987

**Ronald Hartz**  
Reichenhainer Str. 39; Room 411  
phone (0371) 531-4491  
fax (0371) 531-3987

- Faculty of Mathematics:

**Dr. Klaus-Dieter Blume**  
Reichenhainer Str. 41 , Room 720  
phone (0371) 531-2721  
fax (0371) 531-2140

**Dr. Jürgen Schulz**  
Reichenhainer Str. 39, Room 708  
phone (0371) 531-4107

- Faculty of Natural Sciences:

**Dr. Eckart Fromm**  
Reichenhainer Str. 70; Room 360  
phone (0371) 531-3207  
fax (0371) 531-3233

- Faculty of Humanities:

**Prof. Dr. Josef Schmied**  
Reichenhainer Str. 39; Room 223  
phone (0371) 531-4226  
fax (0371) 531-4233

**Prof. Dr. Bernhard Nauck**  
Reichenhainer Str. 41; Room 308  
phone (0371) 531-4225  
fax (0371) 531-2387

**Prof. Dr. Matthias Niedobitek**  
Reichenhainer Str. 39; Room 305  
phone (0371) 531-4912

The persons listed above meet regularly with student representatives and with representatives of the involved University services (International Students' Office: AAA - Student Administration: Studentenwerk - Students' Services: Studentensekretariat - Rector's office) and discuss proposals for the university's ECTS policy.

## **D. Students Administration (Studentenwerk)**

### **1. Accommodation / Housing**

The Studentenwerk Chemnitz (Chemnitz Student Administration) is in charge of the social and cultural well-being of all students.

Thüringer Weg 3 - 2nd floor - 09126 Chemnitz  
phone: (0371) 5628-829 - fax.: (0371) 5628-102  
office hours: Mon-Fri 7.30-11.00 a.m. and 12.30-3.00 p.m.

The Studentenwerk is responsible for the accommodation of the students. It manages 4000 beds and offers various types of rooms.

The monthly rates range between 65 EUR and 150 EUR, depending on the kind of room and hall of residence.

- a single room: 110 EUR (in a non-renovated house) to 150 EUR (in a renovated house);
- a double room (shared): 65 EUR (non-renovated) to 95 EUR (renovated) per person.

In all the new halls of residence (N-D), each room is furnished with a bathroom and a kitchenette (with a refrigerator and 2 hotplates). In the non-reconstructed ones (O-D), the bathrooms and a common kitchen are located on each floor. All dormitories are located on campus.

## 2. Catering

All University residences are self-catering. A good and inexpensive hot lunch can be taken in one of two refectories (Mensa). During the term 3.000 students eat there. A choice of four meals is provided, in addition to salads and desserts. Prices for a meal vary between 1.25 EUR and 1.95 EUR.

- Mensa Reichenhainer Str. 55: Mon-Fri: 10.45 a.m. - 2.00 p.m.
- Mensa Straße der Nationen 62: Mon-Fri: 10.45 a.m. - 1.30 p.m.

In two cafeterias you can enjoy a wide range of snacks, drinks and sweets.

- cafeteria Reichenhainer Str. 55: Mon-Fri: 8.00 a.m. - 10.00 p.m.
- cafeteria Straße der Nationen 62: Mon-Fri: 8.00 a.m. - 2.00 p.m.

## 3. Cost Of Living

The cost of living in Chemnitz is comparatively low. It is estimated that a single student should have a budget of 300 EUR to 450 EUR each month to cover all living expenses.

## E. Study Facilities

### 1. Libraries

The library is divided into a Central library, several smaller branches, a patent information center and a collection of standardizations. It provides books, journals, audio-visual material and electronic information services. The computerized central catalogue system comprises the holdings of all libraries and is accessible at all library locations as well as via the Internet.

- Central Library (University), Straße der Nationen (entrance Bahnhofstr. 2)  
office hours: Mon - Thu: 9.00 a.m. - 9.00 p.m. / Fri: 9.00 a.m. - 6.00 p.m. / Sat: 10.00 a.m. - 1.00 p.m.

#### **Branch Libraries (TB):**

- Economics / Business Studies / Jurisdiction, Reichenhainer Str. 39/41 (floor 4)  
office hours: Mon - Thu: 9.00 a.m. - 9.00 p.m. / Fri: 9.00 a.m. - 6.00 a.m.
- Humanities / Mathematics, Pegasus-Business-Center, Reichenhainer Str. 29a  
office hours: Mon - Thu: 9.00 a.m. - 7.00 p.m. / Fri: 9.00 a.m. - 4.00 p.m.
- Electrical / Mechan. Engineering and Physics / Natural Sc., Reichenhainer Str. 70, Weinhold - Bau  
office hours: Mon - Thu: 9.00 a.m. - 9.00 p.m. / Fri: 9.00 a.m. - 6.00 a.m.

- Mechanical Engineering II / Materials Science, Erfenschlager Str. 73

office hours: Mon, Tue, Thu: 9.00 a.m. - 4.00 p.m., Wed: 9.00 a.m. - 7.00 p.m., Fri: 9.00 a.m. - 2.00 p.m.

- Chemistry, Bahnhofstr. 2

office hours: Mon - Tue: 9.00 a.m. - 11.00 a.m., and 12.00 - 4.30 p.m. / Fri: 9.00 - 11.00 a.m.

- Patent Information Center - PIZ, Bahnhofstr. 8

office hours: Mon, Wed - Fri: 9.00 a.m. - 4.00 p.m. / Tue: 9.00 a.m. - 6.00 p.m.

## 2. Computer Facilities

Office: Str. der Nationen 62 - Room B307  
 phone: (0371) 531-1551  
 fax: (0371) 531-1629

The University Computer Network is a central, scientific facility at the Chemnitz University of Technology. It connects the on-campus network with national and world-wide communication webs, effectively catering to the university's technical demands. The computer labs have developed into a leading facility providing consulting and services for users of today's modern data processing systems. They are accessible to both students and research staff. Student dormitory rooms can be connected to the Internet. Furthermore, tuition-free computer classes are available.

## F. Leisure Activities

### 1. Sports

The university sports center offers a wide range of indoor and outdoor sports, including karate, alpine sports, hiking, climbing, paragliding, tennis, swimming, dancing, volleyball, and many more. The complete programme is available in the dining halls at the beginning of each semester.

For information please contact:

Sportbüro der USG Chemnitz e.V.	phone: (0371) 531-2073-	- Thüringer Weg 11
Universitätssportzentrum	phone: (0371) 531-2430	- Thüringer Weg 11
		- D-09126 Chemnitz

### 2. Clubs

The various student clubs are a good and easy way to meet new people, talk to other students, listen to music, or just relax. They are managed by students and include social as well as more academic events, for example movie evenings, slide shows and dancing.

**beispielsweise:** Vetterstr. 70/72

**bit boutique:** Vetterstr. 64/66

**Filmclub „Mittendrin“:** Reichenhainer Str. 35/37

**FPM-Club:** Vetterstr. 70/72

**PEB-Studentenkeller:** Reichenhainer Str. 37

**Windkanal e.V.:** Vetterstr. 52/54

In addition there are many pubs, restaurants and cafés with a friendly atmosphere located in the city.

### 3. Associations

The Chemnitz University of Technology runs a big number of associations and student groups. Joining one is a great way to meet people and learn from each other. The **English club** meets in the Vetterstr. 64/66 (3rd floor) every Tuesday at 7.30 p.m. During these gatherings, students can improve and practise their English and discuss aspects of English, American and German culture.

More associations are listed below:

- **VDE**            Verband Deutscher Elektrotechniker, Bezirksverein Chemnitz  
(Union of German Electrical Engineers of the District of Chemnitz)  
The members of VDE are engineers, (natural) scientists, technicians, major companies of the electronics and power industries, high-technology firms, as well as numerous research institutions.
  
- **VDI**            Verein Deutscher Ingenieure (Association of German Engineers)  
The VDI was founded in 1856. With 120.000 members it is one of the biggest technical and scientific associations in Europe for studentes and young engineers. Among other things, it represents the interests of the engineering profession.
  
- **AIIESEC**        Association Internationale des Etudiants en Siences Economiques et Commerciales  
(International Association of Economics and Marketing Students)  
This international association, with more than 70,000 members in 85 countries, provides opportunities for exposure and interaction between young people of different cultures and nations worldwide; it assists young people in acquiring skills and knowledge through management education, and it allows students to develop some practical experience in various social and economic environments. Reichenhainer Str. 41; Room 04: Tue 12.30 - 1.30 p.m. / Thu 10.00 - 11.30 a.m.
  
- **GI**              The Gesellschaft für Informatik e. V. (GI) is the organization of the computer scientists. The GI supports Computer Science in research, education and application. Prof. Dr. Peter Köchel, Chemnitz University of Technology, Faculty of Computer Science, leads the regional group Chemnitz.
  
- **MTP e.V.**        Die Marketing - Studenteninitiative. TU Chemnitz (The students' marketing initiative)  
Reichenhainer Str.39; Room 101  
MTP is an initiative with more than 600 members and 14 agencies throughout Germany. The abbreviation MTP stands for **M**arketing between **T**heory and **P**ractice. At the moment there are 16 members at the Chemnitz agency.
  
- **MUKU**           Multikulturelle Studentengemeinschaft (Multicultural Student Community)  
TU Chemnitz - Reichenhainer Str. 52/6th floor.  
This association was founded to provide foreign students with help in any problems they might have to become familiar with the university community. The MUKU also organizes cultural and sporting meetings.

#### **4. Cultural Activities**

The particular strengths of Chemnitz are its cabaret scene and the opera company. Other cultural traditions are also well-represented in theater, galleries, and museums. Two unique museums of particular interest to students of science are the "Industrie Museum" (museum of industry) and the "Spiele Museum" (games and toys museum). Information on these and on special events is available at the city's theater service: (0371) 488-4665.

There are pubs, restaurants, and cafes of various cuisines and styles distributed throughout Chemnitz. Several movie theaters show foreign and art movies (e.g., CineStar Filmpalast, ClubKino Siegmars).

#### **5. Churches**

On campus, several rooms have been reserved for weekly religious meetings of students of the Protestant and Catholic community. More information is posted on the board in the dining hall (Mensa) on Reichenhainer Str. 55.

### **G. Linguistic Requirements – Language Courses**

When registering at the International Students' Office (IUK) of the Chemnitz University of Technology, students will be asked to provide proof of his/her German language proficiency. The following

certificates are accepted:

- the „Zentrale Oberstufenprüfung“ (ZOP) of the Goethe Institute
- the ”Kleines Deutsches Sprachdiplom“ of the Goethe Institute
- any language proficiency certificate equal level (at least senior high school / ”A-level“) from a recognized (scientific) institution
- the DSH certificate, which can be obtained at the Chemnitz University of Technology.

To prepare for the DSH examination, students have the possibility to take an intensive 90 days language course before the beginning of each semester. The courses are held in April and October. It is recommended that ECTS students have the necessary German language skills before they come to Chemnitz to be able to pass the DSH, and to follow classes. ECTS students who wish to improve their language skills can enrol in a two week intensive course at the end of September, or at the end of March. The University also offers language classes throughout the semester. In addition, a language laboratory and a video laboratory are available for independent studies. For further details on tuition etc., please contact:

**Dr. Angela Minogue**  
Sprachzentrum  
Reichenhainer Str. 39, Room 204  
phone (0371) 531-4294

## **H. Insurances**

### **1. Health Insurance**

All residents of Germany must have health insurance. When registering at the International Students' Office (IUK) of the Chemnitz University of Technology, the student will be asked to show the necessary documents from his own health insurance organization (E111 or E107 form).

If a student does not have such documents, he or she is required to get a health insurance in Chemnitz (addresses can be obtained from the Studentenwerk).

### **2. Liability Insurance**

At the Chemnitz University of Technology, there is no requirement for a third-party liability insurance policy. However, students are advised to subscribe to such an insurance in their home country.

## **I. Practical Information**

### **1. Public Transport**

The transportation network in Chemnitz (CVAG) is quite extensive with more than 30 bus lines and 6 tram lines. The same ticket is valid for either bus or tram with no transfer fees. The price of a ticket depends on the duration of the ride: 0.70 EUR for 10 minutes or 1.40 EUR for 1 hour. Weekly, monthly, and annual tickets are also available.

The trip to the campus from the center of town takes about 10 minutes (lines 32 or 42).

From the main bus station (Zentralhaltestelle) in the center of the city it is possible to get to two major shopping centers:

- Alt Chemnitz Center ACC: tram 6, 15 minutes.
- Chemnitz - Center Röhrsdorf: bus 21, 25 minutes

Dresden and Leipzig are at a distance of about 80 km (50 miles) from Chemnitz. There are regional trains and buses operating between Chemnitz and nearby cities.

## 2. Banks

Most major banks have branches in Chemnitz. There, an account can be opened at no charge and with a copy of a valid student ID fees may be reduced or waived.

## 3. Tourist Information Office

Bahnhofsstr. 6

phone: (0371) 690-680

office hours: Mon - Fri: 09.30 a.m. - 5.30 p.m.

## J. History

Chemnitz was founded as a merchant city on the banks of the river Chemnitz, after which the city was named. It had the status of a free imperial town, and around 1136-1137, Emperor Lothar III founded a Benedictine monastery there. But the year 1165 is considered the official date of the foundation of Chemnitz.

After the city had obtained the bleaching monopoly in 1357, Chemnitz became a center of weaving and manufacture of linen. At the same time, the growth of iron ore extraction had great influence on the economic rise of the city. In the 15th century, a small copper processing factory was founded. During the 16th century, cotton came up in the textile industry, and at the end of the Middle Ages Chemnitz became an important center for the textile manufacture in Saxony; products were even exported abroad. From 1728 onward, the hosiery trade was developed and gradually became the main industrial branch. At the end of the 18th century and beginning of the 19th century, the textile manufacture was industrialized. From 1800 onward, Chemnitz took the lead in Germany's mechanical industry and production of machine tools.

In connection with the industrial development, the "Royal Industrial School" (*Königliche Gewerbeschule*) was founded on May 2nd, 1836. In the beginning, it had 14 students and 3 main subjects: Mechanical Technology, Chemical Technology, and Agriculture. Shortly afterwards, its name was changed into "Industrial High School" (*Höhere Gewerbeschule*). The city had almost 11,000 inhabitants at that time.

From 1882 onwards (Chemnitz had 103,000 inhabitants), Electrical engineering had been taught, and in 1892 the Department of Electrical Engineering was established. At the end of the 19th century with its industrial revolution, the number of students for the first time exceeded 1,000. The school received the status of "Royal Industrial Academy" (*Königliche Gewerbeakademie*) in 1900.

Due to the damages of World War II, the academy had to be closed. When it was reopened, it was called "Technical College" (*Technische Lehranstalten Chemnitz*) and had around 500 students.

In 1953, Chemnitz' name was changed into Karl-Marx-Stadt, and the school was now called "College of Mechanical Engineering" (*Hochschule für Maschinenbau Karl-Marx-Stadt*).

Ten years later already more than 1,500 students were enrolled in the Departments of Mathematics, Natural Sciences, Mechanical Engineering and in the newly founded Department of Electrical Engineering.

In 1986 around 8,000 students were studying at the institution, in the same year it received the status of a University of Technology.

After the re-unification of Germany on October 3rd, 1990, the city was renamed Chemnitz.

In 1992, the former College of Education at Zwickau joined the university, which was then named University of Technology Chemnitz-Zwickau. After that the Faculty of Economics and Business Administration and the Faculty of Humanities were added. In 1997, the institute was again renamed, this time into Chemnitz University of Technology.

Today, Chemnitz has approximately 250,000 inhabitants, and approximately 9,000 students are studying at the university. Among them there are around 700 foreign students from more than 30 countries.

There are 7 faculties at the university:

- Electrical Engineering and Information Technology
- Computer Science

- Mechanical Engineering and Process Technology
- Mathematics
- Natural Sciences
- Humanities
- Economics and Business Administration

The faculties are responsible for the correct completion of the respective courses of study. In some cases, they are subdivided into institutes that carry out teaching and research.

### **III. FACULTY OF COMPUTER SCIENCE**

#### **A. General Information**

##### **1. Address**

The address is: Technische Universität Chemnitz  
Fakultät für Informatik  
Straße der Nationen 62  
D-09107 Chemnitz  
Germany

##### **2. ECTS Coordinator**

###### **Prof. Dr. Hanno Lefmann**

Theoretical Computer Science and Information Security  
phone: +49-371-531-1276 (-1431)  
fax: +49-371-531-1810  
email: lefmann@informatik.tu-chemnitz.de

#### **B. Faculty Structure**

The Faculty of Computer Science is structured as follows. It consists of

##### **13 chairs**

- Theoretical Computer Science and Information Security (TI1)
- Theoretical Computer Science (TI2)
- Practical Computer Science (PR)
- Systems Programming and Operating Systems (BS)
- Data Management Systems (DV)
- Computer Graphics and Visualization (CG)
- Modelling and Simulation (MS)
- Artificial Intelligence (KI)
- Information Systems and Software Engineering (IS)
- Computer Networks and Distributed Systems (RN)
- Computer Systems (RS)
- Computer Architecture and Microprogramming (RA)
- Media Studies (MI)

and the

**Faculty's Computing and Information Center**

#### **C. Work and Research Fields**

The chairs of the Faculty of Computer Science cover the following fields

- Applied Computer Science
- Practical Computer Science
- Technical Computer Science
- Theoretical Computer Science.
- Media Studies

(N.N. means „nomen nominandum“ - the chairperson is about to change)

**Chair: Theoretical Computer Science and Information Security (Prof. Dr. H. Lefmann) (TI1)**

- Design and analysis of efficient algorithms
- Mathematical methods of cryptology (design and analysis of methods for realization of confidence, integrity, and authenticity)

**Chair: Theoretical Computer Science (Prof. Dr. A. Goerdts) (TI2)**

- Algorithmic logics
- Efficiency of proof calculi
- Algorithms for integrated circuits design

**Chair: Practical Computer Science (Prof. Dr. G. Rünger) (PR)**

- Parallel Programming
- Design of Compilers

**Chair: Systems Programming and Operating Systems (Prof. Dr. W. Kalfa) (BS)**

- Object-oriented architectures of operating systems
- Distributed operating systems
- Man-machine communication
- Multimedia and operating systems

**Chair: Data Management Systems (Prof. Dr. W. Benn) (DV)**

- Database technology: concepts, methods, tools
- Distributed and heterogeneous database systems, interoperability
- Semantic and object-oriented database systems
- Database systems for AI applications (mainly image processing)
- Database systems for geographical information systems

**Chair: Computer Graphics and Visualization (Prof. Dr. G. Brunnett) (CG)**

- Virtual Reality
- Scientific and technical visualization

**Chair: Modelling and Simulation (Prof. Dr. P. Köchel) (MS)**

- Modelling and simulation of discrete processes
- Evaluation of complex systems
- Algorithms and data structures for discrete simulation
- Queueing networks

**Chair: Artificial Intelligence (Prof. Dr. W. Dilger) (KI)**

- Multi-agent systems
- Configuration of technical systems
- Knowledge-based teaching systems
- Machine learning
- Qualitative reasoning

**Chair: Information Systems and Software Engineering (Prof. Dr. P. Kroha) (IS)**

- Application of object-oriented database systems in CASE tools
- Support of early design phases of information systems by CASE tools

- Object-oriented methods of the software engineering
- Parallel concepts in CASE tools

**Chair: Computer Networks and Distributed Systems (Prof. Dr. U. Hübner) (RN)**

- Protocol interworking
- Network management
- Multimedia communication
- High speed networks
- Design and test tools for distributed systems

**Chair: Computer Systems (N.N.) (RS)****Chair: Computer Architecture and Microprogramming (Prof. Dr. W. Rehm) (RA)**

- Multithreaded architectures
- Object-oriented massively parallel computer architectures
- Neural networks, simulation on parallel computers

**Chair: Media Studies (Prof. Dr. C. Wolff) (MI)****D. Structure Of Studies**

**Duration of Study:** 4.5 years (standard period of study)

**Degree:** Diplom-Informatiker/Diplom-Informatikerin (Dipl.-Inf.)

The following remarks concern the degree course "**Angewandte Informatik**", offered by the Faculty of Computer Science.

An academic year consists of a winter semester and a summer semester. Registration takes place at the beginning of the winter semester only.

Different kinds of courses are offered:

**Lecture (L):** A professor regularly lectures on the subject matter.

**Exercise (E):** The topics of the corresponding lecture are applied in practice, in order for the students to develop some practical experience. Students actively participate in the exercises.

**Basic and Advanced Seminar (S):** Students prepare and present talks using the relevant literature. Lecturers/professors are responsible for selecting topics and leading the discussion.

**Practical Training (P):** Here, students acquire the necessary abilities and skills.

**Compact Course:** A course running continuously for a certain period of time.

**Term Project:** A group of students realizes a scientific project. The project deepens and supplements the lectures, exercises, and practical training courses. The topics, which are treated in a term project, are so broad that problems such as task scheduling, interface definition, operation scheduling, and communication within the team must all be considered.

**Diploma Thesis:** The diploma thesis completes the scientific education. It shows that the candidate is able to apply scientific methods and to solve independently and within a fixed period of time a Computer Science problem. The diploma thesis consists of a written essay and a public defence of the results.

Lectures, exercises, and seminars regularly run 90 minutes. This corresponds to 2 teaching hours per week.

The **Standard Period of Study** is 9 semesters. The studies consist of stage I studies (4 semesters) and stage II studies (5 semesters).

**Stage I Studies** are completed with an intermediate examination: the “Vordiplom”. The student has to prove that she or he successfully finished stage I studies. In particular, she or he has to show that he acquired the basic concepts of computer science and gained a systematic orientation to successfully continue his or her studies.

**Stage II Studies** are completed with the **Diploma Thesis**.

It is recommended that the period for students to enrol in an exchange programme is from the 3rd to the 5th year of studies. The duration can vary from 3 to 12 months

## IV. DESCRIPTION OF LECTURES

### A. General Description

In the tables, the figures indicate the number of hours per week for lectures (L), exercises (E), and practical training courses (P).

Each course is described as follows (Example):

**TI1 Systems Theory** **9 cr**  
**S 3-0-0**

Explanation:

**TI1** Abbreviation of the chair (in German) (see table on page 16)

**Systems Theory** Course Title (in English)

**S 3-0-0** Time and workload in the form "**S L-E/S-P**" (here: Summer, **3** hours **Lecture**, **0** hours **Exercise** (or **0** hours seminar) and **0** hours **practical training** per week.

**9 cr** ECTS credit points.

This short description is supplemented by the verbal description of the topics and information about the required prerequisites, the examination, and the lecturer.

### **Allocation of Credits**

Stage I (first 4 Semesters)	<b>120 cr</b>
Stage II (last 5 Semesters)	<b>150 cr</b>
where the 150 cr are divided as follows	
- all classes completed by passing an examination in obligatory subjects, optionally required and optional subjects of the respective specialization	108 cr
- term project	12 cr
- diploma thesis	30 cr
	<b>270 cr (total)</b>

**B. Stage I - Courses**

Subject	Semester				total	
	1. L-E-P	2. L-E-P	3. L-E-P	4. L-E-P	L-E-P	total
<b>Mathematics</b>	4-2-0	4-2-0	4-2-0	4-2-0	<b>16-8-0</b>	24
<b>Practical Computer Science</b>					<b>10-4-4</b>	18
Algorithms and Programming	4-2-0					
Data Structures		4-2-0				
Software Engineering (practical tr.)				0-0-4		
<b>Technical Computer Science</b>					<b>10-6-4</b>	20
Digital Logics Design	4-2-0					
Computer Organization		4-2-0				
Programming in Assembler Language			2-2-0			
Computer Networks			2-2-0			
Hardware (practical training)			0-0-4			
Integrated Seminar		0-2-0	or 0-2-0	or 0-2-0	0-2-0	2
Minor Subject	see below					22
total + 22 hours of minor subject	18	20	20	18	44-24-8	86

- L      hours of lectures per week  
E      hours of exercises (or seminar) per week  
P      hours of practical work per week

The courses in stage I are not outlined here in detail, because an ECTS student usually completes the stage I studies at the home university. Specification concerning contents is, however, necessary, in order to be able to estimate the qualifications for stage II.

**1. Mathematics**

**Mathematics** courses are dedicated especially for Computer Science students. The following areas of mathematics are included: Propositional logic, set theory, functions, relations, complex numbers, algebraic structures, analytic geometry (1st semester); linear spaces, linear operators, eigenvalue problems (2nd semester); differential calculus, integral calculus (3rd semester); probability theory, statistics (4th semester).

**2. Practical Computer Science**

The course **Algorithms and Programming** deals with the concept of algorithms. Algorithms are central in computer science, as well as their different kinds of description and evaluation. By using a higher procedural programming language, students are introduced into the systematics of programming and program design. These concepts are extended to modular and parallel programming. The course **Data Structures** covers the most essential data structures and algorithms as well as their applications. Apart from practical aspects and implementation, theoretical aspects also play an important role. The course **Higher Programming Languages** considers the different paradigms of programming on the basis of the well known concept of an algorithm: imperative, functional, relational and object-oriented programming. Selected programming languages are treated exemplarily (FORTRAN, PASCAL, ADA, C, LISP, PROLOG, Eiffel, C++, Java, ...) and discussed in view of their application. The practical course **Software Engineering** is based on the methodical concepts of programming and facilitates the acquisition of fundamental experiences with the principles and methods of software engineering. Particular emphasis is put on the design of a prototype of a software

system by a group of students according to a given procedure model with the stages analysis, specification, design, implementation and integration. As a result, the students will acquire knowledge and abilities for the successful practical application of techniques to the design of a larger software system.

### 3. Technical Computer Science

The course **Digital logics design** begins with an introduction to the terms and concepts of digital systems. The terms information, system (behaviour, structure, interface) and automation are of central importance. Based on them, digital computers and their components are to be considered and described as a unit of hardware and software. Models, functions, and drafts of combinatorial and sequential networks are treated. An overview over the operating modes and the technical realization of integrated switching circuits is given. The qualities and the technical realization of function blocks are presented as elements of digital computers. On the basis of the von-Neumann-concept the organization and the architecture of program-controlled digital computers are treated. Furthermore an overview over microcomputers, their components and peripheral devices is given. In the course **Computer organization** the organization of digital computers and their components is treated and an overview over characteristic computer architectures and types of computers is given. The hardware description language VHDL yields a formal description; with VHDL digital computers and their components can be specified, simulated and documented. The structure and the operating mode of the central processor with the key areas control/microprogram control, arithmetic unit and computer arithmetic, I/O organization, I/O interfaces, as well as different kinds of memory organization are treated. The instruction set, the behaviour and the structure of a RISC processor are treated as well as described in VHDL and simulated. The course **Assembler programming** begins with an introduction into tools for design of machine programs (assembler, linker, debugger ). Insight into the architecture of a personal computer is given. The instruction set of its processor is presented. The organization principles and operating modes of main memory, bus controller, interrupt controller, the communication between processor and periphery as well as the protected mode and its applications are taught. As exercises, programs are written for controlling and processing functions including the use of I/O functions. The **Practical hardware training** deepens the knowledge which was acquired by the analysis of the structure and the behaviour of selected digital systems in the courses of technical computer science. Different experiments are prepared, carried out and evaluated, in order to gain practical experience with the hardware and the handling of the corresponding measuring instruments. The Course **Computer Networks** gives an introduction to basics of networking technologies and functions of the several layers and protocols used in connected systems and forms a basis for many courses.

### 4. Basic seminar

In every semester, basic seminars are offered on various subjects. The topics may complement former or running courses or may cover other fields.

### 5. Nontechnical Secondary Subject Field

Necessary knowledge of basic economics, social competence, communication and market orientation are taught in so-called nontechnical subjects. Students can choose from all courses offered by the faculty of humanities as well as the faculty of economics and business administration.

### 6. Secondary Subjects

The courses in the secondary subject field provide every Computer Science student with the opportunity to acquire knowledge in another field in order to enable him/her to integrate computer science into this field:

- embedded systems
- information- and communication systems
- construction- and production technologies
- media studies

**C. Stage II Studies - Courses**

Subject	Semester				total
	5. SWS	6. SWS	7. SWS	8. SWS	SWS
Compulsory Subjects	15	5	-	-	20
Team-oriented project	-	6	-	or 6	6
Advanced Seminar	-	-	-	2	2
System development (practical tr.)	-	-	4	-	4
Term Subject	-	-	-	8	8
Nontechnical subject	4	4	-	-	8
Software technology II	2	-	or 2	-	2
Secondary subjects	see below				34
total	25	24	23	12	84

**1. Compulsory Subjects****TI1 Theoretical Computer Science I**  
**S 4-2-0****7,5 cr**

In this lecture we deal with important and frequently used algorithms from computer science. In particular we analyze their running time and their required storage space, as well as the usage of appropriate data structures. Considered are, among others, sorting algorithms such as quicksort and heapsort as well as graph algorithms such as depth- and breadth-search and shortest-path-algorithms. Moreover, we study Greedy-algorithms, flows in networks, dynamical data structures, etc. The techniques for design and analysis introduced in this lecture will be applied and deepened in the accompanying exercises.

**Prerequisites:** basic knowledge in computer science**Literature:** to be announced**Examination:** oral or written**Lecturer:** Prof. Dr. H. Lefmann**BS Operating Systems**  
**W 2-2-0****6 cr**

The lessons and exercises deal with the architectures, models and other basics of operating systems. Furthermore, principles of the design and implementation of operating systems are discussed. Basic topics are:

- multi-level architecture of operating systems,
- processes (systems of processes, process control, deadlocks, etc.),
- resource management (scheduling, memory, devices, messages, etc.),
- I/O-Control,
- data management and communication

**Prerequisites:** basic studies in computer science, efficient algorithms**Literature:** W. Kalfa: Betriebssysteme**Examination:** oral**Lecturer:** Prof. Dr. W. Kalfa

**DV Data Modelling And Databases (Databases I)**  
**W 2-2-0**

**6 cr**

The lecture explains database design issues, including database architectures, data storage, data models (hierarchical, network, relational) and query processing. In addition, several criteria of designing data schemata are suggested which can be used to guide a concrete database implementation. Furthermore, problems concerning parallel database access, data protection and data security are discussed.

**Prerequisites:** basic knowledge in computer science

**Literature:** C. J. Date: An Introduction to Data Base Systems

**Examination:** oral or written

**Lecturer:** Prof. Dr. W. Benn

**KI Artificial Intelligence**  
**S 3-1-0**

**6 cr**

This course is an introduction into the methods of Artificial Intelligence and its most important applications. These methods include search and optimization (blind search, heuristic search, genetic algorithms) and knowledge representation (logics, probabilistic and fuzzy reasoning). The following application domains are presented: Planning, Machine Learning, Natural Language processing, Image Recognition, Multi-Agent-Systems and Robotics.

**Prerequisites:** basic knowledge in computer science

**Literature:** S. J. Russell, P. Norvig: Artificial Intelligence. A Modern Approach. Prentice Hall, Upper Saddle River, NJ, 1995

**Examination:** oral or written

**Lecturer:** Prof. Dr. W. Dilger

**RA Computer Architecture**  
**W 3-1-0**

**6 cr**

This lecture introduces basic computer architectures and then proceeds to enhance the acquired knowledge on the basis of programming tasks and architecture simulations, carried out in a computer-aided practical exercise. The following topics will be discussed: classes of computer architectures and computing models, system and processor architectures, memory hierarchies and management, architectural support for operating systems, CISC-, RISC, Superscalar-, VLIW- and multithreaded architecture, bus systems and I/O-structures, performance parameters and benchmarking.

**Prerequisites:** courses „assembler programming” and „computer organization”

**Literature:** J. L. Hennessy, D. A. Patterson, Rechnerarchitektur, Vieweg-Verlag, Braunschweig/Wiesbaden, 1994

K. Giloi, Rechnerarchitektur, Springer-Verlag, Berlin, 1993

**Examination:** to be announced

**Lecturer:** Prof. Dr. W. Rehm

**IS Software Engineering I**  
**S 2-0-0**

**3 cr**

- introduction into the problem of programming at large
- methods from engineering which turned out to be useful in the history of technologies
- product and process
- software as product
- properties of software products: correctness, reliability, robustness, etc.
- software development process and its phases
- structured analysis: data flow diagram, finite automata, synchronization, and petri nets

- object oriented analysis: cases of applications and scenaria, modelling with UML
- risk analysis
- specification
  - description and operational specification
  - formal specification: methods of logical specification, methods of algebraic specification
- design, interfaces of modules
- patterns and software architecture
- verification
  - validation, testing, white-box testing, black-box testing, V-model, debugging
  - testing of object-oriented applications
  - testing of distributed applications

**Prerequisites:** basic studies in computer science

**Literature:** to be announced

**Examination:** to be announced

**Lecturer:** Prof. Dr. P. Kroha

## 2. Optionally Required Subjects

Optionally required subjects are divided into several fields of specialization:

- embedded systems
- information and communication systems
- construction and production technologies
- media studies

Students select one of these subjects. ECTS students are not restricted to this arrangement. They can choose - depending on their previous knowledge - any course from the subsequent catalogue.

### **BS     Operating Systems II** **W 2-1-0**

**4.5 cr**

This course is a continuation of „Operating Systems“. We consider both theoretical and practical aspects and focus on the following:

- micro kernel structures
- single address room operating systems
- persistent and multimedia file systems
- security aspects of operating systems
- performance evaluation of operating system components
- case studies and current trends in the development

**Prerequisites:** course „Operating Systems“

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. W. Kalfa

### **CG     Computer Graphics** **W 2-2-0**

**6 cr**

The lectures give an introduction to computer graphics. Main topics are:

- structure of graphical systems
- characteristics and classification of graphics software
- graphics standards
- graphical user interfaces
- procedural and structural graphic representation
- presentation schemes
- methods and algorithms in computer graphics (clipping, transformations, projections, hidden surface algorithms, illumination models, visualization)

The exercises are based on the graphics standard OpenGL.

**Prerequisites:** basic knowledge in computer science, mathematics or engineering

**Literature:** J. Encarnacao, W. Straßer: Graphische Datenverarbeitung 1, Oldenbourg-Verlag 1996  
M. Woo, J. Neider, T. Davis: OpenGL Programming Guide, Addison-Wesley 1996  
J. D. Foley, A. van Dam, S. K. Feiner, J. F. Hughes: Computer Graphics, Addison-Wesley 1990

**Examination:** to be announced

**Lecturer:** Prof. Dr. G. Brunnett, Dipl.-Inf. M. Lorenz, Dipl.-Inform. M. Vanco

**RN    Design Of Distributed Systems**  
**W 2-2-0**

**6 cr**

- basics and concepts
- socket mechanisms (datagram/stream-communication)
- remote procedure call (RPC)
- design of clients, servers, gateways
- WWW enhancements (classification, applications server...)
- Java/TCL in distributed systems
- design and description techniques

**Prerequisites:** course „Computer Networks” and „Protocols And Management”  
 Knowledge of C/C++, Java, TCL and systems functions

**Literature:**

**Examination:** oral

**Lecturer:** Prof. Dr. U. Hübner

**CG    Geometric Modelling**  
**W 2-1-0**

**4.5 cr**

For generating computer graphics of an object, geometric models of this object are needed. Here we deal with techniques and algorithms for generation and manipulation of so called free-form geometries, which are used for the geometric modelling of complex surfaces (like car bodies or wings of a plane).

**Prerequisites:** basic studies in computer science, mathematics or engineering, a visit of the course „Basics Of Computer Geometry“ is of advantage

**Literature:** J. Hoschek, D. Lasser: Grundlagen der geometrischen Datenverarbeitung B.G. Teubner, Stuttgart 1992

**Examination:** to be announced

**Lecturer:** Prof. Dr. G. Brunnett, Dipl.-Inf. M. Vanco

**CG    Seminar Computer Graphics**  
**S 0-2-0**

**3 cr**

The students read and work on selected original papers in the area of processing of big polygonal nets. The participants present talks on their studies.

**Prerequisites:** basic studies in computer science

**Literature:** to be announced

**Examination:** to be announced

**Lecturer:** Prof. Dr. G. Brunnett

**RS    Implementation, Verification And Evaluation Of Embedded Systems**  
**W 2-2-0**

**6 cr**

The lecture continues the lecture “Modelling And Design Methodology Of Embedded Systems”. Methods for the design of embedded systems, their verification and the evaluation of design variants are treated. Among the design methods, the emphasis is on high-level design techniques. The correct functioning of a system presupposes its fault-free design. Therefore, formal verification is introduced.

**Prerequisites:** basic studies in computer science, course „Modelling and Design Methodology of Embedded Systems”

**Literature:** J. Teich: Digitale Hardware/Software-Systeme. Springer Verlag 1997.

D. Gajski et al.: Specification and Design of Embedded Systems. PTR Prentice Hall.

- R. Niemann: Hardware/Software Co-Design for Data Flow Dominated Embedded Systems, Kluwer Academic Publishers 1998.  
 M Keating, P. Bricaud: Reuse Methodology Manual for System-on-a-Chip Design. Second Edition. Kluwer Academic Publishers 1999  
 J. O. Hamblen, M. D. Furman: Rapid Prototyping of Digital Systems. Kluwer Academic Publishers 2000

**Examination:** oral

**Lecturer:** Prof. Dr. D. Monjau

### **TI1 Data Protection and Data Security (Information Security/Systems Security)**

**W 2-0-0**

**3 cr**

More and more information is stored, processed and transmitted electronically in open and local networks. A look at the demands of federal and state laws concerning data protection immediately shows how important the issue of data security is. Considering the dependence of the modern industrial society on information and communication technology, the necessity of data protection and data security for all concerned persons and especially for computer scientists becomes clear. While data protection is occupied with questions of objectives, data security deals with the realization of data protection. The following topics will be considered:

- number theory for cryptography
- public key cryptography, RSA
- Data Encryption Standard

**Prerequisites:** basic knowledge in computer science

**Literature:** scriptum Datenschutz und Datensicherheit (Data Protection and Data Security)

**Examination:** written

**Lecturer:** Prof. Dr. H. Lefmann

### **RS Modelling And Design Methodology Of Embedded Systems**

**S 2-2-0**

**6 cr**

The design of embedded systems takes place according to a homogeneous methodology. This methodology is fundamentally different from the methods which are used for the design of hardware and/or software. This course presents a general systematics of specification and the computer-aided design of embedded systems and related tools. Emphases are the implementation independent specification, the refinement of the demands on the system, the transformation of the specification into a simulatable model, the decomposition into components, and the transformation of the specification into an algorithmic behavioural description which is used as implementation basis. The treated languages are mainly graphically oriented and include higher design languages. Already acquired VHDL knowledge is deepened.

**Prerequisites:** basic studies in computer science

**Literature:** D. D. Gajski et al.: Specification and Design of Embedded Systems. Prentice Hall. 1994.

Teich: Digitale Hardware/Software-Systeme. Synthese u. Optimierung. Springer Verlag, 1997.

**Examination:** oral

**Lecturer:** Prof. Dr. D. Monjau

### **RN Protocols And Management**

**S 4-0-0**

**6 cr**

aim:

- knowledge of relevant protocol stacks and computer net solutions
- design of complex net solutions by combination of different technologies

- knowledge and evaluation of management aspects of computer nets

contents:

- subnet technologies: fast-/gigabit-ethernet, switching, ATM, SONET/SDH
- network levels: IP, routing, multicast, mobile IP, AoS/CoS, IPv6
- transport: TCP/UDP/RTP
- applications and their infrastructure
  - socket interface, DNS
  - FTP, SMTP/POP/IMAP, HTTP (WeSDAV)
  - network file systems (NFS, AFS, SMB)
  - folder systems (X.500, LDAP)
- network management (concepts, MIBs, SNMP, RMON)
- practical scenario

**Prerequisites:** course „Computer Networks“

**Literature:** [mvs.informatik.tu-chemnitz.de/Vorlesungen/pm.html](https://mvs.informatik.tu-chemnitz.de/Vorlesungen/pm.html)

**Examination:** to be announced

**Lecturer:** Prof. Dr. U. Hübner

### **RN Multimedia-Networking-Practice W 1-1-0**

**3 cr**

**Aim:**

- knowledge of processing and transfer of image and voice data
- introduction of components, architectures and algorithms in connection with the usage of time-dependent media
- consideration of technical aspects of networks for transferring multimedia data, especially in IP-networks

**Contents:**

- digital audio / coding
- digital video / coding
- streaming technologies, session management
- voice over IP
- specialties of packet-based digital speech transfer in IP-networks
- technical solutions used in industry
- multicast applications

**Prerequisites:** courses Computer Networks, Protocols and Management

**Literature:** to be announced

**Examination:** to be announced

**Lecturer:** Dr. L. Wolf / Dipl.-Ing. Heik (computer center)

### **RN Computer Networks In Practice W 0-0-4**

**6 cr**

Students will gain experience with different network technologies

- TCP/IP via ethernet
- modems
- routers and repeaters
- protocol analysis
- DNS
- network file systems (NFS, SMB)
- NIS/YP
- e-mail
- point-to-point protocol (PPP)

- GIGABIT-Ethernet

**Prerequisites:** UNIX, courses „computer networks” and „Protocols and Management”

**Literature:** [rns.informatik.tu-chemnitz.de/Praktikum/Rechnernetze/Prakueber.html](https://rns.informatik.tu-chemnitz.de/Praktikum/Rechnernetze/Prakueber.html)

**Examination:** to be announced

**Lecturer:** Dr. J. Anders

**RN Computer Networks And Mobile Communication**  
**W 2-0-0**

**3 cr**

Physical basics of mobile communication systems

- methods of information transmission by electromagnetic/optical procedures
- basic structures of mobile communication systems for speech and data transmission
- mobile wireless systems of the future - the third generation
- services and applications
- structures of private telecommunication networks
- conception of mobile wireless systems with integration into wire-bounded computer networks

**Prerequisites:** lecture „computer networks”, lecture „protocols and management”

**Literature:** to be announced

**Examination:** to be announced

**Lecturer:** Dipl.-Inf. M. Günther

**BS Distributed Operating Systems**  
**S 2-2-0**

**6 cr**

The lessons and exercises deal with the special aspects of modelling, design, and implementation of distributed operating systems based on loosely coupled computers. Basic topics are:

- basic models, taxonomy of parallel and distributed computer systems
- communication in distributed systems (layered protocols, routing, client-server model, RPC; transactions etc.),
- distributed resource management (distribution, caching, replication, migration, naming, etc.)
- implementation.

**Prerequisites:** basic knowledge in computer science and operating systems

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. W. Kalfa

**KI Image Processing**  
**S 2-1-0**

**4.5 cr**

This course introduces into image processing. In particular, we will use tools and techniques from Artificial Intelligence. We will focus on understanding images. There will be exercises accompanying this course. In general, no prerequisites from other courses are needed. This course is also suitable for students from other faculties. Main topics are

- overview
- basics of digital image processing
- image preprocessing
- image segmentation
- characteristics of objects
- object recognition
- three-dimensional image interpretation

**Prerequisites:** basic studies in computer science

- Literature:** Bässmann, Kreys: Bildverarbeitung Ad Oculos, Springer 1998  
 Klette, Koschan, Schlüns: Computer Vision, Vieweg 1996  
 Mallot: Sehen und die Verarbeitung visueller Informationen, Vieweg 1998  
 more information can be found here:  
[www.tu-chemnitz.de/~stj/lehre/bildver.htm](http://www.tu-chemnitz.de/~stj/lehre/bildver.htm)
- Examination:** oral or written
- Lecturer:** Dr. J. Steinmüller

**KI Multi Agent Systems**  
**S 2-0-0**

**3 cr**

Multi-agent-systems are distributed problem solving systems whose components (agents) have a high degree of autonomy. In the course the structure of agents and different ways of cooperation and communication between agents are presented. Examples are given for realization of multi-agent systems which demonstrate how problem solving is achieved through cooperation of autonomous units. Moreover, aspects of multi-agent learning and applications will be considered.

- Prerequisites:** basic studies in computer science
- Literature:** Ferber, J.: Multi-Agent Systems. An Introduction to Distributed Artificial Intelligence. Addison-Wesley, Harlow, Essex, 1999  
 Müller, J. (Hrsg.): Verteilte Künstliche Intelligenz. Methoden und Anwendungen. BI Wissenschaftsverlag, Mannheim, 1993.  
 Huhns, M. N., Singh, M. P. (eds.): Readings in Agents. Morgan Kaufmann Publ., San Francisco, 1998
- Examination:** to be announced
- Lecturer:** Dr. J. Zeidler, Dipl.-Inf. H. Langer

**MS/KI Research Seminar Artificial Intelligence/Modelling And Simulation**  
**W/S 0-2-0**

**3 cr**

This seminar is jointly organized by the chairs „Artificial Intelligence” and „Modelling And Simulation”. The aims of this seminar are the following: Presentation and exchange of research results within the working areas of these two chairs:

- combining methods and the way of thinking in both areas
- regular talks by diploma as well as doctoral students

- Prerequisites:** basic studies in computer science
- Literature:** to be announced
- Examination:** to be announced
- Lecturer:** Prof. Dr. W. Dilger, Prof. Dr. P. Köchel

**RS System-Design-Tools**  
**W 2-2-0**

**6 cr**

The lecture is an introduction into modern methods and tools for design and analysis of highly integrated microelectronic circuits (VLSI). An overview over the design process and the design methods as well as the tools and methods for CAD of integrated circuits is provided. Schematic entry, simulation and fault simulation are treated with the aid of a real CAD system. An introduction is given to the practical use of the CAD system.

- Prerequisites:** basic studies in computer science
- Literature:** scriptum
- Examination:** oral
- Lecturer:** Dr. B. Naumann

**BS Real-time Operating Systems**  
**S 2-2-0**

**6 cr**

This course is an introduction to real-time systems, which are used to handle time-critical jobs. We address the following topics: time and resource-management, process scheduling, fault-tolerance, synchronization and communication.

Moreover we consider some important aspects of existing real-time operating systems like RTLinux, VxWorks or MARS.

**Prerequisites:** basic studies in computer science

**Literature:** to be announced.

**Examination:** oral or written

**Lecturer:** Dr. R. Baumgartl

**IS Software Engineering II**  
**W 2-0-0**

**3 cr**

- design of a user interface
- process of software inspection
- process of software production, waterfall model, evolutionary model, incremental model, prototyping, transformation model, spiral model, software methodology
- configuration management, version management
- CASE management
- project management, methods of complexity estimation, methods and tools for time planning, economic efficiency of projects
- software metrics, function points, feature points
- software quality, ISO 9003, McCabe metric, design metric
- software evolution, problems of old software systems, reengineering
- advanced concepts in programming, generic programming, templates, generative programming, patterns, frameworks, meta programming, adaptive programming

**Prerequisites:** course Software Engineering I

**Literature:** to be announced

**Examination:** to be announced

**Lecturer:** Prof. Dr. P. Kroha

**PM Output Systems**  
**W 2-0-1**

**4,5 cr**

The lecture is an introduction into different output systems. A systematic overview and comparing presentation are given. Display systems, print and picture systems, storage media and special systems will be treated. An exemplaric deepening will follow in a subsequent lecture. At the end of the semester an excursion is planned.

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. C. A. Hübler

**PM Graphical User Interfaces**  
**W 2-2-0**

**6 cr**

The lecture comprises the following topics:

- architecture of graphical window systems
- interaction models

- look & feel standards
- basic principles of the application design on the base of the X window system
- OSF/Motif
- user interface management systems

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Dr.-Ing. F. Schubert

**PM Digital Preprocessing**  
**W 2-1-0**

**4,5 cr**

In this lecture the specific procedures and tools for image processing of print products (prepress) are dealt with:

Systematic of the functions in image processing, analogous precursors (scanning, digital cameras, retouch, image correction, layout systems, digital types), data formats of graphical industry, digitization procedures (scanning, digital camera), raster-image processing (RIP), rational, irrational and stochastic raster procedures, workflow management concepts, algorithms for transformation of the color space, type coding, optical character recognition.

Exercises: Postscript coding, scanning, image processing, color management, image resolution

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. C. A. Hübler

**PM Color Theory**  
**W 2-0-0**

**3 cr**

Color recognition, color mixing, color measure systems, spectral photometry, color deviation. The lecture will deal with physical and physiological basics of color recognition, light-technical basics, principles of color reproduction in print and media techniques, color mixture laws, principles of color measurement, color measure systems and techniques of spectral photometry. The lecture will be supplemented by exercises and a color metric practical course.

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. Wolfgang Beier / Dr. J. Gottlebe

**PM Media Systems**  
**W 3-2-0**

**7,5 cr**

- media systematics
- technical models for information / communication / knowledge
- development paths for media techniques
- technological conditions for media development
- cross media techniques
- digital workflow
- process organization
- database publishing / internet publishing
- print-on-demand
- electronic distribution concepts for print products

- internet printing
- technical conditions for media contents (copyright / authenticity / reliability, generic coding, generic contents, classification)
- technical conditions for media concepts

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Prof. Dr. C. A. Hübler

**PM    Typography & Design**  
**W 2-0-0**

**3 cr**

- types
- type mixture
- typographical design basics with single sheet design
- accident setting
- work setting
- color theory with color psychology and color mixture
- text-image design

Especially on the screen modern techniques offer a lot of variants and possibilities to design. However, for the design of print products as well as electronic products, rules, which have developed historically, have to be considered - due to technical conditions or necessary to achieve good effects.

The lecture will be organized in five complexes, where in the first four complexes the basic rules for the design of type and image products in different settings as well as the basic rules of color design and efficiency are treated. We will shortly mention the special features of screen products. In the fifth complex practical exercises on the design of print products are carried out.

**Prerequisites:** basic studies

**Literature:** to be announced

**Examination:** oral

**Lecturer:** Dr. J. Gottlebe

### 3. Secondary Subjects

#### Secondary Subject Embedded Systems

lecture	semester				L-E-P	total
	5. L-E-P	6. L-E-P	7. L-E-P	8. L-E-P		
micro processor systems	2-1-0	1-0-1			3-1-1	5
electronic circuits techniques	2-1-0				2-1-0	3
circuit design			2-1-1		2-1-1	4
design systems for integrated circuits			2-1-0		2-1-0	3
micro systems techniques		3-0-0			3-0-0	3
modelling and design of embedded systems		2-1-1			2-1-1	4
implementation, verification and evaluation of embedded systems			2-1-1		2-1-1	4
design tools for embedded systems					2-1-1	4
special computer architectures or real-time operating systems	2-1-1			2-0-0	2-0-0	2
information security			2-1-0		2-1-0	3
<b>total</b>	<b>10</b>	<b>9</b>	<b>14</b>	<b>2</b>	<b>22-8-5</b>	<b>35</b>

#### Secondary Subject Information And Communication Systems

lecture	semester				L-E-P	total
	5. L-E-P	6. L-E-P	7. L-E-P	8. L-E-P		
protocols and management		4-2-0	or	4-2-0	4-2-0	6
design of distributed systems	2-2-0	or	2-2-0		2-2-0	4
software tools		2-2-0	or	2-2-0	2-2-0	4
digital communication networks	2-0-0				2-0-0	2
optionally required subjects (18 SWS)						18
information security	2-0-0		2-0-0		2-0-0	
multimedia systems		2-0-0	or	2-2-0	2-2-0	
mobile communication in computer networks		2-1-0			2-1-0	
distributed operating systems	2-2-0	2-2-0	or	2-2-0	2-2-0	
operating systems theory	2-1-2	or	2-2-0		2-2-0	
communications engineering		2-1-0			4-2-2	
<b>total</b>	<b>10</b>	<b>10</b>	<b>8</b>	<b>6</b>		<b>34</b>

**Secondary Subject Construction- And Production Technologies**

lecture	semester				total	
	5. L-E-P	6. L-E-P	7. L-E-P	8. L-E-P	L-E-P	total
<b>computer science</b>	Students have to choose 14 SWS of lectures from the chairs engineering-computer science and modelling and simulation					14
<b>construction technologies</b>	Students have to choose 14 SWS of lectures from the chairs construction technologies or general mechanical engineering (faculty of mechanical and process engineering).					14
<b>production technologies</b>	Students have to choose 14 SWS of lectures from the chairs of production technologies or fabrication systems (faculty of mechanical and process engineering).					14
<b>total</b>						42

**Secondary Subject Media Studies**

lecture	semester				total	
	5. L-E-P	6. L-E-P	7. L-E-P	8. L-E-P	L-E-P	total
image processing	2-1-0				2-1-0	3
computer graphics			2-2-0	2-2-0	4-4-0	8
gemoteric modelling		2-2-0			2-2-0	4
media databases	2-2-0				2-2-0	4
media systems			3-2-0		3-2-0	5
<b>optionally required subjects I</b>						4
continous media			2-2-0		2-2-0	
graphical user interfaces			2-2-0		2-2-0	
<b>optionally required subjects II</b>						6
output systems	2-0-1				2-0-1	
digital preprocessing		2-1-0			2-1-0	
digital media			2-0-2		2-0-2	
color theory	2-0-0				2-0-0	
typography & design				2-0-0	2-0-0	
<b>total</b>						37