



## Master's Programme International Software Systems Science

Information brochure  
for the freshmen introduction  
on 17th & 18th of April 2019

## Timetable for the New Student Orientation

<b>Wednesday, the 17th of April 2019</b>	
09:00 – 10:30	<p><b>For all majors – plenary assembly in lecture hall (in German only)</b> WE5/00.022</p> <ul style="list-style-type: none"> <li>Prof. Dr. Ute Schmid, Faculty Dean</li> <li>Prof. Dr. Daniela Nicklas, Faculty Dean of Studies</li> <li>Prof. Michael Mendler, Ph.D., Study Abroad Representative</li> <li>Caroline Oehlhorn, Women's Representative</li> <li>Sabine Haselbek, contact point for disabled persons at the university</li> <li>Maximilian Raab and Dr. Carolin Stange, Service Desk WI and Exam Committee AI</li> <li>Dipl. Päd. Kai Imhof, Central Student Advisory Service</li> <li>Lara Aubele and Marius Hofmann, Faculty Student Representatives</li> </ul> <p><i>Distribution into groups and announcement of meeting point for the start of the tour</i></p>
10:45 – 12:00	<p><b>Master ISoSySc – Introduction</b> Aboubakr Benabbas in WE5/03.004</p>
<b>Lunch break</b>	
13:30 – 15:00	<p>Fun &amp; Games</p> <ul style="list-style-type: none"> <li>University tour</li> <li>Library tour</li> <li>Visit at the office of the faculty student representatives</li> <li>Introduction of university related groups</li> </ul>
16:00 – 16:30	<p><b>Tour trough the university building at Feldkirchenstraße 21</b> Meet us at the main entrance of F21 or take the bus with us from ERBA (we leave at 15:15).</p>
<b>Thursday, the 18th of April 2019</b>	
Please bring your own laptop.	
10:00 – 11:30	<b>Setup of the university IT services</b> in WE5/04.014
11:45 – 12:30	<b>Introduction of the University of Bamberg Computing Centre</b> in WE5/00.019
<b>Lunch break</b>	
13:30 – 14:30	<p><b>Introduction to the university online services</b> (FlexNow, UnivIS, etc.) Room: WE5/04.014</p>
from 14:30	<p><b>Tutorial</b> with individual support to set up a timetable Room: WE5/02.020</p>

# Welcome to the Faculty of Information Systems and Applied Computer Science at the University of Bamberg

***Dear Students,***

Professors and staff of the Faculty of Information Systems and Applied Computer Sciences are delighted to welcome you to the University of Bamberg. This guide is intended to help you familiarise yourself with the university and issues relating to your upcoming studies. We would like to cordially invite you to participate in the Introduction Days for first-year students taking place on the 17th and 18th of April 2019 in the ERBA building *An der Weberei 5*.

The faculty aims at integrating first-year students into daily life at the university from their first day onwards, helping you avoid “wrong tracks” and inspiring you to actively take part in university life. During the orientation we will offer lectures on topics of general interest for first-year students and take up special issues in various tutorials. (The updated and detailed schedule is to be found on the left side.) We especially want to encourage you to plan your schedule for the first semester during the orientation and get to know important contact persons for different issues coming up during your studies.

The orientation for first-year students is being organised by the *Fachschaft WIAI*<sup>1</sup> (Faculty Student Representatives) and financially supported by the “action programme to shorten the length of study at Bavarian universities” (*Aktionsprogramm zur Verkürzung der Studiendauer an den Universitäten Bayerns*) established by the Bavarian State Ministry for Education, Science and the Arts (*Bayerisches Staatsministerium für Bildung und Kultus, Wissenschaft und Kunst*).

***The Faculty of Information Systems and Applied Computer Sciences wishes you a good start at the University of Bamberg and success in your studies.***

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<sup>1</sup>“WIAI” is an acronym for German *Fakultät für Wirtschaftsinformatik und Angewandte Informatik* [Faculty of Information Systems and Applied Computer Science].

## Contents

<b>1</b>	<b>The University of Bamberg</b>	<b>1</b>
<b>2</b>	<b>The WIAI Faculty</b>	<b>2</b>
<b>3</b>	<b>International Software Systems Science (ISoSySc)</b>	<b>5</b>
<b>4</b>	<b>ISoSySc Studies and Exam System</b>	<b>6</b>
<b>5</b>	<b>Creating a Timetable</b>	<b>21</b>
<b>6</b>	<b>eLearning</b>	<b>27</b>
<b>7</b>	<b>Languages</b>	<b>28</b>
<b>8</b>	<b>Internship / Graduate Study Abroad</b>	<b>29</b>
<b>9</b>	<b>Computer Labs &amp; icprint</b>	<b>31</b>
<b>10</b>	<b>Internet Access for Students</b>	<b>32</b>
<b>11</b>	<b>Fachschaftsvertretung WIAI</b>	<b>33</b>
<b>12</b>	<b>Map of the ERBA Campus</b>	<b>35</b>
<b>13</b>	<b>Bus Connections</b>	<b>37</b>
<b>14</b>	<b>Publishing Information</b>	<b>41</b>

# 1 The University of Bamberg

The University of Bamberg is a medium sized university with a distinct profile in Humanities and Cultural Studies, Social and Economic Sciences as well as Human Sciences and Applied Computer Sciences. The university is divided into the following four faculties:

- Humanities, "*Geistes- und Kulturwissenschaften*" (**GuK**),
- Social Sciences, Economics and Business Administration, "*Sozial- und Wirtschaftswissenschaften*" (**SOWI**),
- Human Sciences and Education, "*Humanwissenschaften*" (**Huwi**), and
- Information Systems and Applied Computer Sciences, "*Wirtschaftsinformatik und Angewandte Informatik*" (**WIAI**).

The German name of the University of Bamberg, Otto-Friedrich-Universität, has the following origin: in 1647 Prince Bishop Melchior **Otto** Voit of Salzburg founded the predecessor of today's university; Prince Bishop **Friedrich** Karl of Schönborn is said to be one of the first major sponsors of the university and expanded it generously in 1735 by a law faculty (which no longer exists today).

The university is distributed over numerous buildings in different parts of the city. A complete list and a map can be found online:

<https://www.uni-bamberg.de/en/university/directions-locations/>

As a student in the International Software Systems Sciences degree, you will attend most of your classes at the following location:

- ERBA, *An der Weberei 5* (abbreviated **WE5**): WIAI faculty, Language Centre, ERBA Library, and Cafeteria

Apart from the ERBA, you may need to be aware of the following other university locations (note the abbreviations which are used in the coding of classroom and office numbers):

- *Feldkirchenstraße 21* (**F21** or **Feki**): library, canteen (also called *Mensa*), SOWI faculty and classrooms in the old canteen *alte Mensa* (**FMA**)
- *An der Universität* (**U2 – U11**), *Am Kranen* (**KR1 – KR14**): classes for modules offered by the GuK faculty
- *Markusplatz 3* (**M3**) and *Markusstraße 8a* (**MG1** and **MG2**): classes for modules offered by the Huwi faculty
- *Austraße 37* (**AU37**): Women's Office, *Studentenwerk*
- *Kapuzinerstraße* (**K16**, **K20/22**, **K25**): University Board of Management, Central University Administration, Office of the Academic Registrar, Central Student Advisory Service, and International Office

## 2 The WIAI Faculty

The Faculty of Information Systems and Applied Computer Sciences (WIAI), which was established on October 1st, 2001, is characterised by an interdisciplinary curricular layout that remains the only one of its kind in Germany. It combines the field of Information Systems, with its foundations in both Business Science and Computer Science, with a range of applied computer sciences focused on the humanities and human sciences, and also with classic subject areas pertaining to theoretical and practical Computer Science. Synergy with the university's main focus areas in the humanities, human sciences and in social sciences, economics and business administration is fostered by integrative course offerings and joint research endeavours. Due to this application-oriented curricular profile within a forward-thinking, thoroughly integrated modern course offering, our research-led degree programmes occupy a unique place in international education. Thus, the faculty embraces the increasingly important non-technical dimension of the applied computer sciences with currently 15 research chairs and professorships of high international renown. These are organised in three sections:

- The Information Systems section with course offerings in *Information Systems* and *International Information Systems Management* has a long tradition in Bamberg: in the 1987/88 winter semester the first course of studies in Information Systems was established at a Bavarian university and was the third one in Germany.
- The Applied Computer Science section with course offerings in *Applied Computer Science* and *Computing in the Humanities* addresses the usage of computer science in innovative applications. The required foundations and methods in Informatics are imparted as well as a full qualification profile for the conception and development of user-oriented applications from Media Informatics and Cultural Computing to Cognitive Science and Smart Environments.
- The Computer Science section provides course offerings in *Software Systems Science* focusing on the advanced engineering of complex distributed and mobile software systems which are gaining critical importance in modern IT applications and infrastructures. The modules cover advanced software engineering methods, aspects of privacy and security in IT, state-of-the-art networked, distributed and mobile software technologies, as well as novel techniques for analysing and verifying complex software.

We have 1800 enrolled students in our 11 bachelor's and master's degree programmes which make up 10% of the total student body in Bamberg. Research-led education at the faculty provides for a strong international component by including an optional study abroad experience and foreign language modules. Our teaching is characterised by a first-class supervision, modern lecture and seminar rooms, well-furnished laboratories and a library at the new university facilities on the *ERBA Insel*.

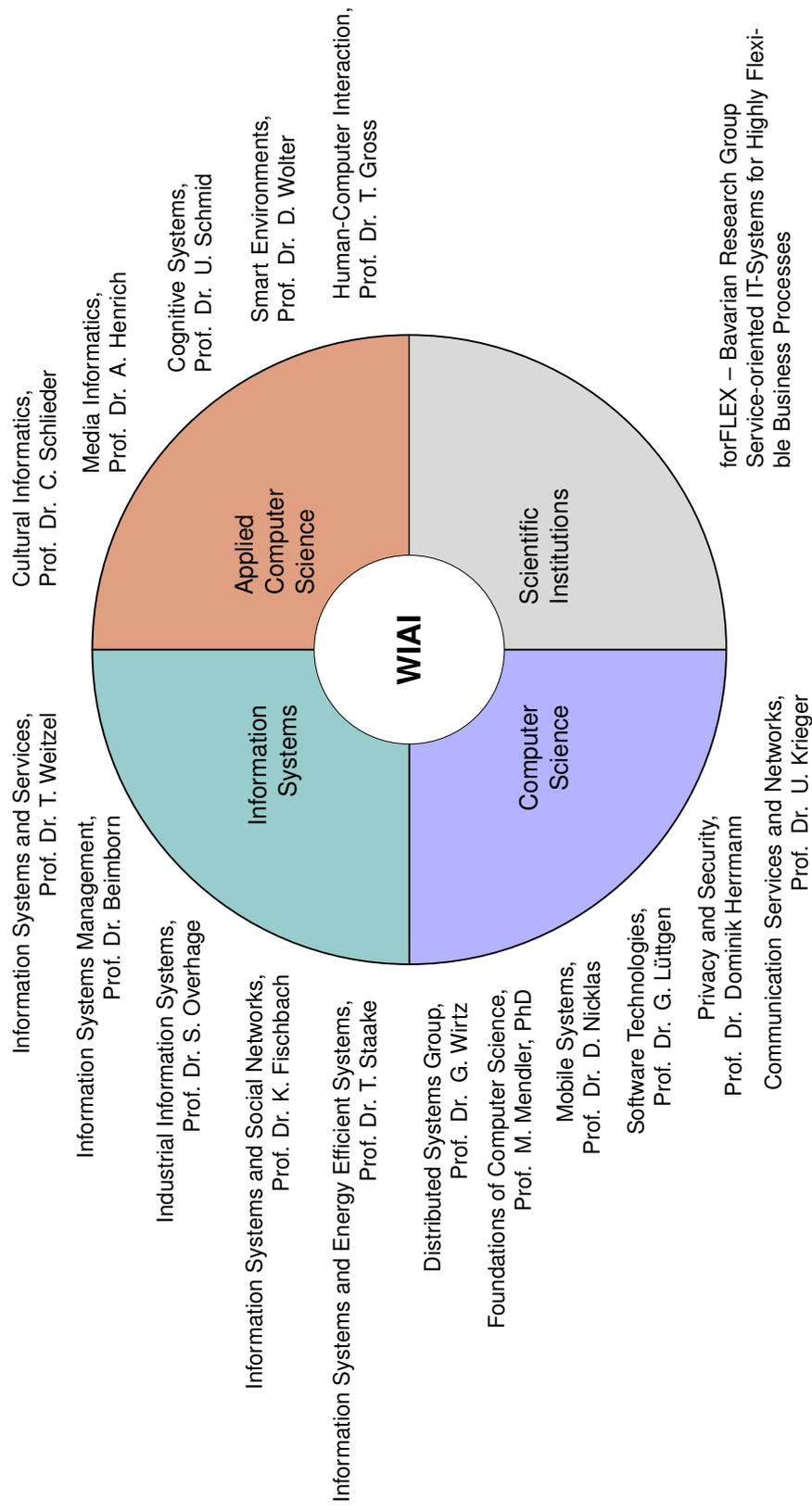


Figure 1: Diagram: Chairs, Professorships and Institutions of the WIAI Faculty (For Details see <http://www.uni-bamberg.de/en/wiai/subject-groups/>)

## 2.1 Women's Representative of the WIAI Faculty

The Women's Representative is the first contact point for suggestions, complaints or questions concerning women-specific affairs in the WIAI faculty. At the WIAI, you can join a network of students and lecturers who provide information on special offerings for women in Informatics, regular meetings and organised field trips. Furthermore, the Women's Representative is active in the university-wide panel for a family friendly university and organises Computer Science workshops for girls at secondary schools. More information can be found at <https://www.uni-bamberg.de/en/wiai/the-faculty/gremien/womens-commisioner/>.

Women's Representative:

Caroline Oehlhorn

☎ Telephone: 0951/863-2879

Office: WE5/04.035

✉ [wiai.frauenbeauftragte@uni-bamberg.de](mailto:wiai.frauenbeauftragte@uni-bamberg.de)

Assistant Women's Representatives:

Professor Dr. Ute Schmid

Professor Dr. Daniela Nicklas



### 3 International Software Systems Science (ISoSySc)

Software is the driving fabric behind many of the technological advances that enrich our every-day lives at home, work and in public. Software arises from human imagination and creativity and there seems hardly limit to what software can achieve. Yet, software is also a serious engineering enterprise. More and more important tasks in government administration, industrial production, health care, public transport, etc., are being put into the “digital hands” of mobile and networked computer systems. The underlying software must be extremely reliable and constructed according to the highest standards. Meeting the demands on safety and robustness cleverly is both exciting and a challenge as distributed software is becoming increasingly complex. The power to design such software for the next generations comes equally from the creativity for discovering unconventional solutions and the mastership of advanced professional techniques and methodologies that are scientifically grounded in a system-oriented perspective.

Have you completed an undergraduate degree in Computer Science or a closely related area and wish to prepare yourself solidly for a career in the software industry or software research? Then our new master’s degree programme is right for you. The degree programme in International Software Systems Science (ISoSySc) enables you to specialise in all tasks needed for analysing, designing and developing large, networked software systems with innovative methods. The programme is informed by current trends in industry and research, and relays advanced knowledge in the architecture, development and analysis of modern software by teaching state-of-the-art techniques and methods in complex software engineering for distributed and mobile software systems.

Through your choice of elective modules you can put special emphasis on the following focal areas:

- S1 Distributed and Mobile Systems,
- S2 Software Analysis and Verification,
- S3 Service-oriented Architectures or
- S4 Networked Systems and Communication Protocols

Student projects and a study period abroad or an industrial internship broaden your perspective, strengthen your team aptitude and help you gain valuable experience. This will equip you with all skills and knowledge necessary to succeed as a highly valued software expert in the dynamic and future-proof IT industry, or as a skilled researcher in international laboratories in industry or at university. Since all teaching is conducted in English, this is your springboard for a career in the globalised economy.

## 4 ISoSySc Studies and Exam System

### 4.1 General Information

You will find important information on the master's degree programme in International Software Systems Science in the following documents:

- **Study and Subject Examination Regulations (StuFPO<sup>2</sup>)** for the ISoSySc master's degree programme
- **General Examination Regulations (APO<sup>3</sup>)** applicable to all bachelor's and master's degree programmes of the WIAI faculty
- **Module Handbook (MHB)** for the ISoSySc master's degree programme containing the module tables and list of available course offerings.

These documents can be found as PDF files at ↗ <http://www.uni-bamberg.de/en/ma-isosysc/regulations-documents/> .

➡ **Please note:** although the information given in this brochure is produced with care, it is not legally binding. It does not replace the careful study of the aforementioned official regulatory documents. Wherever there is an English version available, the German original is still the legally binding text.

The master's degree programme in International Software Systems Science can be studied as a full-time or part-time course of study. The documents above along with the subsequent explanations apply to full-time studies. For part-time studies, there are additional regulations which can be found here: ↗ <http://www.uni-bamberg.de/en/ma-isosysc/part-time-studies/>.

Current information on the available teaching modules, their dates and locations as well as detailed instructions and teaching materials for the current semester can be found here:

- the course catalogue "*Vorlesungsverzeichnis*" in the **UnivIS online information** pages (see Sec. 5.1) ↗ <http://univis.uni-bamberg.de/> and the
- **Virtual Campus** at ↗ <https://vc.uni-bamberg.de/moodle/index.php?lang=en> where you can also register for your selected modules.

See also Sec. 5. If you have any questions, please do not hesitate to contact the programme study advisor as indicated in the following Section 4.2.

Apart from the modules' individual websites, there are other useful general courses you should register for on the Virtual Campus. Specifically, you will receive news and an-

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<sup>2</sup>StuFPO is an abbreviation for the German name of these regulations, "*Studien- und Fachprüfungsordnung*"

<sup>3</sup>APO is an abbreviation for "*Allgemeine Prüfungsordnung*"

nouncements concerning the degree programme and examinations via the following two information forums:

- General information forum of the examining board for Applied Computer Science, Computer Science and Computing in the Humanities: ➔ <https://vc.uni-bamberg.de/moodle/course/view.php?id=972>
- Joint **SoSySc Information Forum** for the B.Sc. and M.Sc. degree programmes in Software Systems Science: ➔ <https://vc.uni-bamberg.de/moodle/course/view.php?id=960>

You can also post questions in the forums. See also Sec. 6.2.

➔ **Please note:** The information forum of the examining board serves all degree programmes and will issue information mostly in German. However, the relevant advice will also be repeated on the SoSySc Information Forum.

## 4.2 Programme Advisory Service

If you have questions about your studies, do not hesitate to contact the Degree Programme Advisory Service:

### Programme Study Advisor: Aboubakr El Hacen Benabbas

☎ Phone: 0951/863-3672  
Office: WE5/05.129  
Office Hours: By Appointment



Please send a short notice if you are planning on stopping by:

✉ [studienberatung.ma-isosysc@uni-bamberg.de](mailto:studienberatung.ma-isosysc@uni-bamberg.de)

## 4.3 Duration of Studies

The master's degree has a regular duration of four semesters (see StuFPO § 30 Paragraph 1) for acquiring the master's degree. To allow for individual variations, you can extend the duration of your studies up to a maximum of six semesters (see StuFPO § 30 Paragraph 2).

## 4.4 Teaching Periods

The teaching periods during the next two semesters are:

- Summer Semester: April 23, 2019 – July 27, 2019
- Winter Semester: October 14, 2019 – February 7, 2020.

The Christmas break is between December 24, 2019 and January 6, 2020. For information on bank holidays (in German: “*vorlesungsfreie Tage*”), please see the university’s web page at ➤ <https://www.uni-bamberg.de/studium/im-studium/studienorganisation/vorlesungszeiten/> (German only).

#### 4.5 European Credit Transfer and Accumulation System (ECTS)

The degree programme is delivered through individually examined teaching modules. Each teaching module has an associated workload measured in credit points in line with the **ECTS** (European Credit Transfer System). It measures the average total workload in hours that is typically needed to complete a module. You should consider this when planning your study schedule for a semester. A module with more ECTS points normally also means a higher workload:

- 1 ECTS = 25-30 hrs total student workload (all inclusive)
- 30 ECTS = 750-900 hrs total module load per semester
- 6 ECTS = 150-180 hrs for a standard course module of 4 contact hrs/week, combining lectures+tutorials

The full degree programme has 120 ECTS points.

ECTS points are granted for successfully passing a given module’s examinations. The module handbook describes what the examination consists of and what the minimum requirements are to pass (possibly different parts of) the exam, see Sec. 4.6 below. The ECTS points are also used as an arithmetic weight by which the module mark influences the final mark of your degree.

➤ **Please note:** In order to complete your studies in the nominal period of 2 years, you must attend an average of 30 ECTS worth of modules each semester. Also, you must have achieved a minimum of 60 ECTS points before you are permitted to start work on your master’s thesis (see StuFPO § 33, Paragraph 4).

#### 4.6 Teaching Format and Assessment

Modules have different teaching formats and course types (lecture, tutorial, lab session, seminar, block course, excursion, etc.); there are also different forms of assessment (oral exam, written exam, open book assignment, written essay, colloquium, presentation, ...). Exactly which kind of courses and form of assessment apply to a module is determined by the module lecturer. Details can be found in the module handbook.

The duration of a course is normally given in **teaching hours** per week, abbreviated “**SWS**” (German for “*Semesterwochenstunden*”). In general, 1 SWS corresponds to a 45 minute lesson per week during the semester period of typically 14 weeks. The time for preparation and revision work is not included in the SWS count.

#### 4.6.1 Teaching Format

The following is a list of the main types of courses you will experience:

**Lectures.** Lectures serve as an introduction to the topic of a single module and convey the basic terms and approaches of the field. Also, they are meant to give a systematic overview of the subject. The number of participants is not limited.

**Tutorials.** In tutorials, the material covered in the lectures presented in greater detail. Relevant methodical and technical skills can be acquired and intensified by practice with concrete tasks or case studies. The number of participants may be limited due to restrictions in room size and/or lab equipment. Also, tutorials may require submission of solutions to homework assignments and/or presentation of solutions in class.

**Seminars.** Seminars are courses where specific questions of the various subdomains of Software Systems Science are expanded upon and discussed. In seminars, you deepen your knowledge of a specific topic through independent research and by compiling a scientific paper (*Hausarbeit*) based on your findings. Normally, students are also expected to give an oral presentation (*Referat*). The number of participants is typically limited.

**Projects.** With projects, you can apply and intensify your acquired knowledge and skills in a field of your choice. This normally involves a practical task that is undertaken by you independently or as a group work. It is documented in a project report (*Hausarbeit*) and presented in a project presentation (*Kolloquium*). Your work may be graded on an individual basis or for the group as a whole. This will be determined by the lecturer.

► **Please note:** With few exceptions (notably, seminars and project meetings), there is no formal requirement for attendance. Often lecturers do not check attendance. This gives you considerable freedom but also great **personal responsibility** to ensure your learning progress. You are expected to follow the topics covered in class continuously, prepare yourself before the classes and revise the material carefully at home. In particular, before class you are expected to consolidate your knowledge by reading the relevant materials as indicated by the lecturer. These **private studies** are an integral part of every module in the research-led ISoSySc master's level programme.

#### 4.6.2 Assessment

The course assessment is mostly carried out through written or oral exams, homework assignments, project deliverables, written essays and lab practicals. Combinations of these forms of assessment are also possible. The precise form of the examination and the relative weighing of the marks obtained from these parts are left to the discretion of the course lecturer. However, they are specified in the module handbook.

Final written exams are usually held immediately after the end of the semester, i.e. February/March for the winter semester and the end of July/August for the summer semester. Be aware that there are **strict deadlines for exam registration**, usually some time after the first half of each semester. You can find more information below in Sec. 4.7.

In some modules, it is possible to gain bonus points for the exam by completing optional homework assignments during the semester.

►► **Please note:** Most modules are normally offered **either** in the winter **or** in the summer semester. Some modules, such as projects and seminars are offered in the winter **and** in summer semester. Exams are generally offered each semester. This means that

- ... if you **miss** a module in one semester, you may have to wait one year before you can **attend** it next time. However,
- ... if you **fail** a module in one semester, you can **resit the exam** in the following semester. You only have to register for the exam and do not need to attend the module classes a second time.

## 4.7 Flexible Exam System

Every module is assessed through one or more exams as described in the corresponding module handbook entry for the module. There could be a written or an oral exam, the writing of a term paper, a presentation, colloquium or a combination thereof. In case of a combination, the module handbook specifies the relative weight of each component.

The different forms of assessment are described in the General Examination Regulations APO § 9 Paragraph 2.

Passing a module's exam(s) is the prerequisite for acquiring the associated ECTS points.

### 4.7.1 Examination Dates

The exams are linked to modules and take place after the end of every semester, i.e., in February/March for the winter semester and July/August for the summer semester. Most module exams can be taken during the exam period of every semester, whether or not the module is delivered during that semester.

There is no formal requirement that you must take the exam(s) during the semester in which you attend the module. You can decide each semester on which exams you want to register for, see Secs. 4.7.3 and 4.7.7 below.

►► **Please note:** Although this gives you the freedom to create your individual study and exam plan, you are strongly advised to **take the exam(s) immediately**. If you fail, you can re-sit the exam during the exam period of the following semester. You can re-sit an

exam as often as necessary **but only within the limits of the maximum 3-year study period.**

#### 4.7.2 Optional Assignments “Bonus Points”

In some modules, you can complete optional assignments during the semester to gain bonus points in order to improve your exam grade. However, you must pass the exam itself for the bonus points to be added to your credit. You will find out from the course website or during the first lectures of a module if there are such optional assignments.

#### 4.7.3 Registration and Deregistration for the Exams

You must register for your exams via the electronical exam administration tool of the University of Bamberg, called **FlexNow2**. You can reach it via:

➔ <https://fn2stud.zuv.uni-bamberg.de/FN2AUTH/FN2AuthServlet?op=Login>.

FlexNow2 – The online exam administration tool of the University of Bamberg.

With your student registration, you should have received the necessary access credentials (ba-identification, password) as well as your transaction numbers (TANs). You can find a detailed documentation on the FlexNow2 website. The website is currently in German but will be available in English in time. If you encounter problems with the registration, please contact the Office of Examinations:

Elaine Lopez-Hirt

Office K25/01.19

☎ Phone: 863-1132

✉ [wiai-pruefungen@uni-bamberg.de](mailto:wiai-pruefungen@uni-bamberg.de)

Office Hours:

By Appointment

Alternatively, feel free to contact the ISoSySc programme study advisors (see Sec. 4.2). They will be happy to give you a hand with your exam registration.

► **Please note:** Be sure that you do not miss the **exam registration deadlines** when planning to register for your exams. The registration period is announced by email, on the homepage of the examining board and through the SoSySc Information Forum on the Virtual Campus (see Sec. 4.1). It is usually quite early in the semester, so be sure to pay attention to it. **When in doubt, ask your class mates!**

It is also possible to **deregister from exams**. The cancellation period normally begins shortly after the beginning of the registration period. After the end of the deregistration period, there is no possibility to withdraw from an exam.

#### 4.7.4 Registration for Projects

In order to ensure that you receive all information about upcoming projects, you must participate in the VC-course *Zentrale WIAI-Projektanmeldung*. This VC-course contains specific information about centrally organised projects and their requirements. At the bottom of the VC-course you can find additional information about decentralised projects.

At the end of each semester, you can apply for centrally organised projects within the central project registration for the subsequent semester. For further information about specific projects and central project registration, join the VC-course or send an e-mail to the specific academic unit offering decentralized projects.

<https://vc.uni-bamberg.de/moodle/course/view.php?id=24052>

#### 4.7.5 Registration for Seminars

In case you would like to participate in a seminar, you must search for information about the first session in the UnivIS, VC-course or on a specific academic unit's website. Generally, you need to attend the first session for further information about registration and other procedures.

Additionally, you should join the WIAI Fachschaft VC-course, which collects all information about seminar topics and distributes them via newsletter before the new semester starts.

<https://vc.uni-bamberg.de/moodle/course/view.php?id=284>

#### 4.7.6 Oral Exams

Please note that oral exams require an additional appointment for the exam. Appointments can be made at the respective academic units offering the exam. In case you are sick, you can withdraw from the exam without failing. For this, you would need to get a sick note from a general physician for the day of the exam and submit it to the examiner.

#### 4.7.7 Repetition of Exams

According to the General Examination Regulations APO § 11 Paragraph 3, it is possible to repeat a module exam that was failed. Module exams you passed cannot be repeated.

Resitting a failed exam is only possible for the whole module exam (APO § 11 Paragraph 4, Clause 1). This means that if you fail just a part of the module, in case the module's assessment comprises several segments, you have to **repeat the whole module exam**, i.e., all exam segments. However, optional assignments are transferred for the next exam grade, provided you retake the module exam in the next exam period within the regular cycle (see APO § 11 Paragraph 4, Clause 2). After that, results from optional assignments expire as well.

**The master's thesis can only be repeated once** according to APO § 18.

►► **Please note:** The contents of a module exam are always based on the topics presented in the classes during the last time the module was regularly offered. So, if you do not take the exam immediately at the end of the semester, you may find the lecturer of a class has changed some of the contents of the course. This means you need to prepare different topics for the exam the next time round. In this case, check with the respective lecturer, so you know what is expected!

## 4.8 Example Module Description

Now that you know about the most important terms and regulations, here is a short example of a module description as you will find it in the module handbook:

<b>Module SWT-ASV-M Applied Software Verification</b> <i>Applied Software Verification</i>		6 ECTS / 180 h
Version 3.0.0 (since WS14/15) Person responsible for module: Prof. Dr. Gerald Lüttgen		
<b>Contents:</b> This module focuses on the increasingly important field of automated software verification, which aims at increasing the quality of today's complex computer systems. Students will be introduced to modern automated software verification and, in particular, to software model checking, and will be familiarised with a variety of important formal verification concepts, techniques and algorithms, as well as with state-of-the-art verification tools.		
<b>Learning outcomes:</b> On completion of this module, students will be able to thoroughly analyse software using modern software verification tools and understand the state-of-the-art techniques and algorithms that drive cutting-edge development environments offered by major software companies.		
<b>Remark:</b> The main language of instruction is English. The lectures and practicals may be delivered in German if all participating students are fluent in German.  The total workload of 180 hrs. is split approximately as follows: <ul style="list-style-type: none"> <li>• 30 hrs. attending lectures (Vorlesungen)</li> <li>• 30 hrs. attending practicals (Übungen)</li> <li>• 60 hrs. preparing and reviewing the lectures and practicals, including researching literature, studying material from additional sources and applying software tools</li> <li>• 30 hrs. working on the assignment (Hausarbeit)</li> <li>• 30 hrs. preparing for the colloquium (Kolloquium)</li> </ul>		
<b>Recommended prior knowledge:</b> Basic knowledge in algorithms and data structures, mathematical logic and theoretical computer science. Knowledge of the module "Foundations of Software Analysis" (SWT-FSA-B) - or equivalent - is desirable.		<b>Admission requirements:</b> Compare regulations governing examinations (Studien- und Fachprüfungsordnung)
<b>Frequency:</b> every summer semester	<b>Recommended semester:</b>	<b>Minimal Duration of the Module:</b> 1 Semester

<b>Module Units</b>	
<b>1. Lectures in Applied Software Verification1</b> <b>Mode of Delivery:</b> Lectures <b>Lecturers:</b> Prof. Dr. Gerald Lüttgen <b>Language:</b> English/German <hr/> <b>Contents:</b> The lectures (Vorlesungen) will address the following topics in automated software verification: (i) state machines, assertions and algorithms for state space exploration; (ii) temporal logics for specifying program properties; (iii) model checking using binary decision diagrams; (iv) SAT-based bounded model checking; (v) software model checking based on decision procedures; (vi)	2,00 Weekly Contact Hours

<p>abstraction-based software model checking. In addition, several state-of-the-art software verification tools will be introduced.</p> <p><b>Literature:</b></p> <ul style="list-style-type: none"> <li>• Baier, C., Katoen, J.-P. Principles of Model Checking. MIT Press, 2008.</li> <li>• Clarke, E., Grumberg, O. and Peled, D. Model Checking. MIT Press, 1999.</li> <li>• Huth, M. and Ryan, M. Logic in Computer Science. 2nd ed. Cambridge University Press, 2004.</li> <li>• Kroening, D. and Strichman, O. Decision Procedures: An Algorithmic Point of View. Springer, 2008.</li> <li>• Loeckx, J. and Sieber, K. The Foundations of Program Verification. 2nd ed. Wiley, 1987.</li> </ul>	
<p><b>2. Practicals in Applied Software Verification2</b></p> <p><b>Mode of Delivery:</b> Practicals</p> <p><b>Lecturers:</b> Scientific Staff Praktische Informatik, insbesondere Softwaretechnik und Programmiersprachen</p> <p><b>Language:</b> English/German</p> <p><b>Contents:</b></p> <p>Students will practice the various theoretical and practical concepts taught in the lectures (Vorlesungen) by applying them to solve verification problems using several modern model-checking tools, and also by engaging in pen-and-paper exercises. Emphasis will be put on presenting and discussing the solutions to the exercises by and among the students, within the timetabled practicals (Übungen).</p> <p><b>Literature:</b></p> <p>- see the corresponding lectures -</p>	<p>2,00 Weekly Contact Hours</p>

<p><b>Examination</b></p> <p>Coursework Assignment and Colloquium / Duration of Examination: 20 minutes Duration of Coursework: 3 weeks</p> <p><b>Description:</b></p> <p>Assignment (Hausarbeit) consisting of questions that practice, review and deepen the knowledge transferred in the lectures and practicals (Vorlesungen und Übungen).</p> <p>Colloquium (Kolloquium) consisting of questions testing the knowledge transferred in the lectures and practicals (Vorlesungen und Übungen), on the basis of the submitted solutions to the assignment (Hausarbeit).</p>	
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#### Terminology:

- WS = Winter Semester, SS = Summer Semester
- SWS = weekly teaching hours, 1 SWS = 45 mins

## 4.9 Structure of the ISoSySc Master's Degree Programme

The following gives you an idea of the overall structure of the degree programme. Please consult the web pages ↗ <http://www.uni-bamberg.de/en/ma-isosysc/>. Also, follow the SoSySc Information Forum on the Virtual Campus (see Sec. 4.1) regularly for further **up-to-date information**.

#### 4.9.1 Module Groups

The ISoSySc master's studies are structured into five thematic module groups, each of which specifies a range of electives from which you select to define your personal study path. The module groups, named A1–A5, are described in attachment 1 of the study and examination regulation (StuFPO) for the ISoSySc master's degree and on the web page ↗ <http://www.uni-bamberg.de/en/ma-isosysc/structure-and-curriculum/>:

- A1 Software Systems Science** [30-48 ECTS]: In this module group you choose 30-48 ECTS from the advanced-level modules in foundations of computer science, communication systems and computer networks, mobile software systems, software technology and programming languages as well as distributed systems and security and privacy.
- A2 Domain-specific Software Systems Science** [0-18 ECTS]: This module group comprises 0-18 ECTS of optional advanced-level modules from applied fields of computer science related to Software Systems Science such as IT management, energy efficient systems, smart environments, human-computer interaction, cognitive systems, computing in the cultural sciences and social networks. The available offerings may change from one year to the next.
- A3 Seminar and Project** [12 ECTS]: In this module group you will attend a seminar and run a project to deepen your understanding of the topics covered by the module groups A1 and A2.
- A4 Master's Thesis** [30 ECTS] In the master's thesis, you conduct independent research leading to a written dissertation on a given advanced topic in an area related to Software Systems Science. This individual work is supervised and guided by a member of the faculty's academic staff.
- A5 International Experience** [30 ECTS] Here you get the opportunity to enrich your studies through a distinctively international academic or industrial experience.

You can find a list of the available modules within these different module groups in the module handbook which is published before the beginning of every winter semester. It is valid for one academic year. The current version of the module handbook can be found at: ↗ <http://www.uni-bamberg.de/en/ma-isosysc/regulations-documents/>

You also have the possibility to take up to 18 ECTS in foreign languages. More information concerning the language offerings can be found in the languages section.

The sum of the credit points to be acquired, including the master's thesis, is 120 ECTS. This means that if you cover an average of 30 ECTS points per semester, you can complete within the regular study duration of 4 semesters as stated in Sec. 4.3.

The following will provide you with the current list of modules offered within the different module groups for the academic year 2018-2019. The choices may change during the 2018-2019 academic year.

#### 4.9.2 Module Group A1 – Software Systems Science [30-48 ECTS]

Abbreviation	Name	Sem.	ECTS	Req. <sup>4</sup>
DSG-DSAM-M	Distributed Systems Architecture and Middleware	WS	6	DSG-EiDistrSys
DSG-IDistrSys	Introduction to Distributed Systems	SS	6	DSG-EiAPS-B DSG-EiRBS-B DSG-PKS-B
DSG-SOA-M	Service-Oriented Architecture and WebServices	SS	6	DSG-EiDistrSys
DSG-SRDS-M	Selected Readings in Distributed Systems	WS, SS	3	DSG-EiDistrSys
Gdl-AFP-M	Advanced Functional Programming	SS	6	DSG-EiAPS-B DSG-EiRBS-B Gdl-GTI-B Gdl-Mfi-1
Gdl-IFP	Introduction to Functional Programming	WS	6	DSG-EiAPS-B DSG-EiRBS-B Gdl-GTI-B Gdl-Mfi-1
KTR-GIK-M	Foundations of Internet Communication	SS	6	KTR-Datkomm-B MI-AuD-B DSG-EiAPS-B
KTR-MAKV-M	Modelling and Analysis of Communication Networks and Distributed Systems	SS	6	Gdl-Mfi-1 KTR-Mfi-2 Stat-B-01 Stat-B-02
KTR-MMK-M	Multimedia Communication in High Speed Networks	SS	6	KTR-Datkomm-B
KTR-Mobi-M	Mobile Communication	WS	6	KTR-Datkomm-B MI-AuD-B
MOBI-DSC-M	Data Streams and Complex Event Processing	WS	6	SEDA-DMS-B
MOBI-ADM-M	Advanced Data Management	SS	6	SEDA-DMS-B
SWT-ASV-M	Applied Software Verification	SS	6	SWT-FSA-B
SWT-PCC-M	Principles of Compiler Construction	WS	6	MI-AuD-B Gdl-GTI-B
PSI-AdvaSP-M	Advanced Information Security and Privacy	SS	6	PSI-IntroSP-B

<sup>4</sup>Recommended prerequisites for students continuing on from the BSc SoSySc.

### 4.9.3 Module Group A2 – Domain-specific Software Systems Science [0–18 ECTS]

Abbreviation	Name	Sem.	ECTS	Req. <sup>4</sup>
EESYS-ES1-M	Energy Efficient Systems I	SS	6	–
EESYS-DAE-M	Data Analytics in Energy Informatics	WS	6	–
HCI-MCI-M	Human-Computer-Interaction	SS	6	DSG-EiAPS-B DSG-EiRBS-B MI-AuD-B
HCI-US	Ubiquitous Systems	WS	6	DSG-EiAPS-B DSG-EiRBS-B MI-AuD-B
KInf-SemInf-M	Semantic Information Processing	WS	6	–
KogSys-ML-M	Machine Learning	WS	6	Gdl-Mfl-1 MI-AuD-B
SME-STE-M	Introduction to Knowledge Representation: Space, Time, Events	WS	6	–
SNA-OSN-M	Project Online Social Networks	WS	6	SNA-ASN-M SNA-NET-M

Since some courses might stipulate prerequisites, which you are missing, you can catch up by attending a bachelor's course. The StuFPO (Study and Subject Examination Regulations) stipulates in § 40 Paragraph 5 that **up to 12 ECTS** can be taken from bachelor's modules. If you wish to take this option, you have to file an application with the degree programme representative in which you provide evidence that the contents of the requested bachelor's module:

1. were not covered by your completed B.Sc. degree (e.g. add your B.Sc. transcript)
2. are a prerequisite for a specific master's module (e.g. add statement from the module lecturer).

#### 4.9.4 Module Group A3 – Seminar & Projects [12 ECTS]

Abbreviation	Name	Sem.	ECTS	Req. <sup>4</sup>
<i>Seminars (generic)</i>			3	
SSS-SEM-M	Master-Level Seminar in Software Systems Science (generic)	WS, SS	3	–
<i>Projects</i>			9	
MOBI-PRS-M	Master Project Mobile Software Systems (SoSySc)	SS	9	SEDA-DMS-B
DSG-Project-M	Distributed Systems Project	WS, SS	9	DSG-EiDistrSys
SWT-PR2-M	SWT Masters Project in Software Systems Science	SS	9	–
KTR-SSSProj-M	KTR Master Project Software Systems Science	WS, SS	9	DSG-PKS-B KTR-Datkomm-B KTR-Mfl-2 SWT-SWL-B
PSI-ProjectSP-M	Project Security and Privacy	SS	9	–

Master’s seminars are offered every semester by the faculty’s research groups in Computer Science, Applied Computer Science and Information Systems. You are free to choose any of these seminars, provided they are related to Software Systems Science and apply and/or deepen the knowledge gained from the module groups A1 and A2.

Please contact the lecturers (or secretary) of the research groups for available seminars and projects, or check the module lists “*Vorlesungsverzeichnis*” at the UnivIS online information pages (see Sec. 5.1) ↗ <http://univis.uni-bamberg.de/>.

➡ **Please note:** In contrast to most other teaching modules you will have to **register** to participate in a seminar or a project. There may be class size restrictions and also compulsory attendance. Seminars and projects may run on a regular (e.g., a weekly or bi-weekly) schedule or they may be organised as a block seminar (a fixed number of full-day sessions). Make sure to find out about the detailed teaching format as early as possible. Sometimes the seminar and project topics are already available at the end of the semester prior to the semester in which the module is scheduled.

#### 4.9.5 Module Group A4 – Master’s Thesis [30 ECTS]

Through the independent research and writing of the master’s thesis, you will demonstrate your ability to apply your knowledge and technical skills acquired to solve a well-defined specific topic in the area of Software Systems Science using scientific methods.

The topics are typically issued by the WIAI research groups, professors, and lecturers on their web pages, notice boards or during their classes. You may also suggest a topic of your own, according to your personal interests and specific background. In any case, you

must find a member of staff to act as your supervisor for the thesis. Please contact the appropriate member of staff to agree on a suitable topic. You will normally choose your supervisor from the academic members of staff within the Computer Science section of WIAI. You may also approach professors from other sections, such as Applied Computer Sciences or Information Systems. However, the topic must fall within the field of Software Systems Science.

Before starting on the master's thesis, you must register with the Office of Examinations (*Prüfungsamt*) by filling in a form which fixes the working title of the proposed thesis, the name and signature of the supervisor and the date of commencement. The allotted overall working period is **6 months**.

Remember that you must have acquired at least 60 ECTS credit points before being admitted to the master's thesis. The mark of the thesis is entered into your final cumulative mark with a weight of 30 ECTS points.

#### **4.9.6 Module Group A5 – International Experience [30 ECTS]**

Here, you get the opportunity to enrich your studies through a distinctively international academic or industrial experience. You can do this at three levels of “ambition”:

- **Full Study Abroad:**  
You spend at least one semester studying abroad, for instance, at one of our partner universities. There you may select study abroad modules from the graduate-level offerings of the partner institution. It is necessary that the topics fall within the area of Software Systems Science and are pre-arranged through a learning agreement. The total amount of credit points obtained abroad should be at least 30 ECTS.
- **International Experience:**  
What if you cannot bring home the required 30 ECTS from studies abroad or simply do not want to study abroad? Then you have the option of completing an internship in an international context, preferably abroad, that covers topics of the occupational field of Software Systems Science. This internship must comprise at least 12 ECTS credit points, corresponding to 360 working hours in a foreign or internationally active domestic company or research institute.

The detailed regulations are described in the StuFPO (English translation available) and in the module handbook (in English). For further advice, you may contact the degree programme advisor (Sec. 4.2) as well as the Faculty's Career and International Centre, see Sec. 8.1.

➡ **Please note:** If you plan to study abroad, it is crucial that you start planning at the beginning of your first semester in Bamberg. The **application deadline** for the University of Bamberg's exchange programme is the **end of November** each year in order to go abroad in the following year. (See also Sec. 7.1)

## 5 Creating a Timetable

Since the ISoSySc degree programme offers many individual choices, there is no fixed timetable or standard prescribed sequence of modules everyone has to take. Instead, you create your own personal timetable every semester within the options permitted by the MSc ISoSySc exam regulations. This section gives you the most important facts you need to know to build your timetable.

### 5.1 Sources of Information on Modules and Classes

In general, you can obtain all the information, such as the dates, times and venues of classes, information on the lecturer, the module content and teaching materials, from the following sources:

1. **Course catalogue UnivIS**<sup>5</sup> (↗ <http://univis.uni-bamberg.de>)
2. **Virtual Campus** (↗ <http://vc.uni-bamberg.de>, see Sec. 6.2)
3. **Module websites** of the different teaching and research groups
4. **Notice boards and class announcements** by the different teaching and research groups.

The image shows a screenshot of the UnivIS website interface. The page title is "UnivIS Informationssystem der Otto-Friedrich-Universität Bamberg". The search bar contains "Lehrveranstaltungen". The main content area displays a list of courses under the heading "Praktische Informatik". The list includes:

- DSG-PKS-B: Programmierung komplexer Systeme: DSG-PKS-B Programmierung komplexer Systeme** | Wirtz, G.  
VU; 4 SWS; Mi, 12:00 - 16:00, WE5/04.014
- DSG-Project-2-SoSySc-B: Bachelorprojekt Software Systems Science** | N.N.  
PROJ.; 8 SWS; Zeit und Ort nach Vereinbarung
- DSG-Projekt-B** | N.N.  
PROJ.; 4 SWS; Zeit und Ort nach Vereinbarung
- DSG-Sem-B:** | Wirtz, G.  
S; 2 SWS; Di, 18:00 - 20:00, WE5/03.004
- Einführung in die Informatik: Algorithmen, Programmierung und Softwaretechnik: DSG-EIAPS-B Einführung in die Informatik: Algorithmen, Programmierung und Softwaretechnik** | Wirtz, G.  
V; 2 SWS; Di, 10:00 - 12:00, WE5/00.022
- Einführung in die Informatik: Algorithmen, Programmierung und Softwaretechnik: DSG-EIAPS-B Einführung in die Informatik: Algorithmen, Programmierung und Softwaretechnik - Gruppe 1** | N.N.  
Ü; 2 SWS; Mo, 16:00 - 18:00, WE5/04.004

Callouts on the left side of the screenshot provide instructions:

- "Using the Navigation you find all the courses" (points to the navigation menu)
- "Add a course to your collection" (points to the "Add" button in the course list)
- "Change the view by clicking here" (points to the "Darstellung" menu)
- "You can search for persons or courses here." (points to the search bar)
- "Use this to see your course collection" (points to the "Suche" button)
- "Change the semester database" (points to the "Semester" dropdown menu)

The UnivIS online data base of the University of Bamberg.

The time designation in the module information is usually to be read as "*cum tempore*," abbreviated "*c.t.*" – which is Latin for "with academic quarter." That means in effect that

<sup>5</sup>UnivIS stands for "University Information System."

a lecture with 2 SWS in the time slot from 2pm–4pm, or 14:00–16:00, starts at 14:15 and ends at 15:45. Lectures stated to begin "s.t." – *sine tempore*, Latin for "without time" – start sharp on the hour, i.e., commence at 14:00 and end 15:30.

Normally, the lecturer will announce the details about course organisation on the module's web page in the Virtual Campus and during the first session. Remember that you may have to register for seminars and projects. This will be specified in the information sources mentioned above.

Tutorials and workshops may be offered in several "duplicate" sessions per week. In this case, you only need to attend one of the sessions that fits with your timetable.

If you are uncertain about things like differing dates or rooms of a certain course, the lecturer or the secretary of the lecturer's research group is the right person to ask for clarification.

► **Please note:** Although there are mostly no attendance requirements on modules, this does not mean you may come and go as you like. Coming in late and leaving early creates a disruption you should avoid for reasons of courtesy. A lecturer can refuse to let you join in after the class has started. If you have an overlap between classes or unavoidable problems reaching a class on time, please tell the lecturer at the beginning of the semester.

## 5.2 Personal Study Plan

At the beginning of every semester you create your personal timetable. It is your responsibility to select a suitable set of courses. In doing so, you should consider the following:

- The timing of the classes must not overlap and should allow for sufficient room to move between different university premises if necessary
- The selection of modules must satisfy the ISoSySc degree regulations
- The total workload during the semester must be manageable.

To ensure you get this right, you are strongly advised to make a **provisional study plan** for the full M.Sc. study period during the first days of your studies. Present your study plan to the degree programme advisor (Sec. 4.2) and get it signed as a **learning agreement** (Sec. 5.3) between you and the examining board. **Update your study plan** regularly during the course of your studies and talk to the degree programme advisor every time you change your plan.

From the study plan, you can create your timetable using UnivIS (Fig. 5.1) and print it out.

To give you an idea of what a study plan looks like, we have filled in one example for you here. You can find more samples and further information on the MSc ISoSySc Web pages, see

➤ <http://www.uni-bamberg.de/en/ma-isosysc/regulations-documents/>.

The study plan is designed for

- full-time study
- start of studies: summer semester
- international Experience
- specialisation area: Distributed and Mobile Systems (S1)

Table 5: Exemplary study plan starting in summer semester (see ↗ <http://www.uni-bamberg.de/en/ma-isosysc/regulations-documents/>)

Sem.	Module	ECTS	SWS	Module Group	Focal areas
SS 2019	Advanced Data Management	6	4	A1	S1
	Advanced Security and Privacy	6	4	A1	S1, S4
	Service-Oriented Architecture and Web Services	6	4	A1	S3
	Deutsch als Fremdsprache intensiv 1	6	6	A5	-
	Introduction to Distributed Systems	6	4	A1	S1, S3, S4
Total 1. Semester		30	22		
WS 2019/20	Distributed Systems Architecture and Middleware	6	4	A1	S1
	Master Seminar	3	2	A3	-
	Deutsch als Fremdsprache intensiv 2	4	4	A5	-
	Machine Learning	6	4	A2	S3
	Data Streams and Complex Event Processing	6	4	A1	S1, S4
	Principles of Compiler Construction	6	4	A1	S2
Total 2. Semester		31	22		
SS 2020	Deutsch als Fremdsprache B1: Hoerverstehen	3	2	A5	-
	Deutsch als Fremdsprache B1: Grammatik	3	2	A5	-
	Deutsch als Fremdsprache B1: Kulturvermittlung	3	2	A5	-
	Distributed Systems Project	9	-	A3	S3
	Internship (international context)	12	-	A5	-
Total 3. Semester		30	ca. 20		
WS 2020/21	Master's Thesis	30	-	A4	S1
Total 4. Semester		30	ca. 20		
total		121	ca. 84		

### 5.3 Learning Agreements

In the ISoSySc master's programme you may exercise considerable freedom as to which specific study path to take. There are many decisions you can make to personalise your studies. You can select your own electives within each of the module groups A1 and A2, determine the order in which you attend the classes and decide in module group A5 whether you want to study abroad or conduct an internship. If you study abroad, you will have to select suitable modules at the partner university. If you do an internship, you must ensure that it has sufficient international context and the work you do has sufficient relevance for Software Systems Science.

This is why learning agreements are useful. These are formal written agreements between you and the examining board concerning the recognition of ECTS points which you intend to acquire as part of your degree studies. Learning agreements are meant to give you the extra peace of mind to make sure that the modules you plan to attend or the internship you intend to do are approved within the scope of the degree regulations.

➡ **Please Note:** You can only get ECTS points for modules available in the M.Sc. ISoSySc Module Handbook.

- A learning agreement is mandatory for any modules not listed in the Module Handbook. The learning agreement must be filled in and **submitted by no later than 7 days** before examination registration will be started to the Office of Examinations for approval.
- Do not rely on the statement of lecturers regarding their lectures. Even if you get a *Schein* (course certificate) after you have passed an exam, this doesn't guarantee that you will get the ECTS points.
- **A learning agreement doesn't include registration for exams.** You must register via FlexNow2 or as a *Scheinteilnehmer*

Typically, learning agreements are entered before you leave for a study abroad period or start an internship. However, we strongly recommend that you also use a learning agreement to get module selections in your study plan (Sec. 5.2) approved at the beginning of the first semester.

The procedure of entering a learning agreement differs depending on the type of crediting. The learning agreement forms and an overview of the procedure can be found on the Virtual Campus web pages (log in with your student user account) of the programme examining board.

On the following two pages, you can see an example of a learning agreement for a proposed study plan. There are similar forms for learning agreements concerning internships and studies abroad. The learning agreement forms can be obtained online at

➤ <http://www.uni-bamberg.de/en/ma-isosysc/regulations-documents/>

or the programme examining board's Virtual Campus announcement page:

➤ <https://vc.uni-bamberg.de/moodle/course/view.php?id=972>.

**Learning Agreement (M.Sc. International Software Systems Science - ISoSySc)**



Mrs./Mr. ....  
*Surname, First Name* .....  
*enrollment number* .....

I hereby request approval for the overleaf/following study plan to satisfy the formal requirements of the Master's degree in International Software Systems Science as specified in section §40 of the degree regulations (StuFPO):

I am aware that this learning agreement does not bind me to attend the specified modules and that it can be changed at any time, subject to reapproval by the degree examining board.

I am also aware that separate learning agreements are required for internships and international studies abroad in module group A5, and that this additional learning agreement must be submitted in the semester before the start of the internship or my departure for the studies abroad.

**General structure of my personal study plan:**

- full-time study  part-time study
- Start of studies: summer semester  winter semester
- Module Group A5:  
 international internship  international study abroad
- Intended focal area(s) according to Section §36 StuFPO: (please specify)  
 .....

Student's contact details:

.....  
*Zip Code, City* .....

.....  
*Street, House number* .....

.....  
*Phone* .....

.....  
*Email* .....

Figure 2: First page of the learning agreement form for a study plan.

The Faculty of Information Systems and Applied Computer Sciences WIAI

Proposed Study Plan

Semester	Module	ECTS	SWS	Module Group	Focal Areas
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>1st semester total</b>					
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>2nd semester total</b>					
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>3rd semester total</b>					
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>4th semester total</b>					
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>5th semester total</b>					
<input type="checkbox"/> WS ..... <input type="checkbox"/> SS .....					
<b>6th semester total</b>					
<b>total</b>					

.....  
Place, Date

.....  
Student's Signature

Approved by the MSc ISoSySc Examining Board

.....  
Place, Date

.....  
Signature degree examining board

Figure 3: Second page of the learning agreement form for a study plan.

## 6 eLearning

### 6.1 Virtuelle Hochschule Bayern

Like in every other degree programme, you have the possibility to attend additional modules provided by the platform called *Virtuelle Hochschule Bayern* (vhb). The vhb offers online multimedia lectures that have been compiled by several Bavarian universities since May 2000. The offerings of the vhb currently comprise 13 subjects including Computer Science, Culture Studies, Information Systems or Business and Economics. Providers and organisers of the respective lectures are the participating universities or lecturers who submit virtual course offerings. **In some cases, an online vhb lecture can be credited instead of courses that are conducted at the University of Bamberg.** Please contact your examining board if you have further questions regarding the crediting of vhb courses.

Further information regarding the available modules of the vhb can be found at the official website of the *Virtuelle Hochschule Bayern*<sup>6</sup>: <https://www.vhb.org/>

### 6.2 Virtual Campus

Most of the lecturers at the University of Bamberg upload their module descriptions and class materials to the Virtual Campus (VC) <http://vc.uni-bamberg.de>. The VC also provides both module-related and general news/discussion forums.

Having logged in with your BA number, you will have access to all the VC-courses that are offered in the current semester. For some closed-group VC courses, you first have to get in contact with the moderator who can provide you with an access keyword. Besides, the VC courses associated with the modules you attend, we recommend you register for the following courses right at the beginning of your studies:

1. **"Informationen des Prüfungsausschusses AI"**  
<http://vc.uni-bamberg.de/moodle/course/view.php?id=972>
2. **"Diskussionsforum zum Master ISoSySc"**  
<http://vc.uni-bamberg.de/moodle/course/view.php?id=960>.

It is through these news forums that we can inform you about interesting events and remind you of important regulations concerning the M.Sc. ISoSySc degree programme.

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<sup>6</sup>Unfortunately, the site is German only at this time, but the English language version should be available again by mid-late April.

## 7 Languages

The Language Centre offers a range of language courses for students from all faculties. You can find all the information on their website: <https://www.uni-bamberg.de/sz/> (in German).

Among others, there is also a course for German as a Foreign Language. You can access information about this course by following this link:

<https://www.uni-bamberg.de/en/sz/study/sprach-und-kursangebot/angebot-sprachausbildungskurse/allgemeinsprachliche-kurse/kurse-fuer-auslaendische-studierende-daf/> (in German).

### 7.1 Registration

For most of the language courses, you have to register online via FlexNow2. The registration normally starts four weeks before the start of the semester and lasts six weeks.

Please register via FlexNow2:

<https://fn2stud.zuv.uni-bamberg.de/FN2AUTH/FN2AuthServlet?op=Login>.

## 8 Internship / Graduate Study Abroad

### 8.1 Career & International Center

The Career & International Center offers information regarding career/internships and gives advice on the study abroad programmes at the University of Bamberg. Thus, it is your prime contact for implementing your studies in the A5 module group. In particular, it may help with internships in Germany and abroad, job offers for graduates as well as informational events and work-oriented advanced training.

Contact person: Dr. Laura-Christiane Folter  
☎ Phone: 863-2977  
Office: WE5/01.019  
Office Hours: by appointment



Please send a short notice before you stop by: ✉ [careercenter.wiai@uni-bamberg.de](mailto:careercenter.wiai@uni-bamberg.de)

You can find links to interesting job fairs or recommended literature about the topic of applications at the web page: <https://www.uni-bamberg.de/en/wiai/career/news/new-wiai-career-center/>. In the Virtual Campus (VC) you can find information on current job offers, internships or other company events in the course “*Jobbörse WIAI*.”

## 8.2 International Affairs Representative

Please contact the Career & International Center (Sec. 8.1) for special study-specific or organisational questions about planning and pursuing studies abroad within the A5 module group. In the Virtual Campus course “*Studium International WIAI*” you can find detailed information on the topic “International Studies”.

If you need further help or general advice, you can contact the WIAI International Affairs Representative:

**Prof. Michael Mendler, PhD**  
**Foundations of Computer Science**

☎ Phone: 0951/863-2828  
Office: WE5/05.041  
Office Hours: by appointment



Please send an email to arrange a meeting: ✉ [michael.mendler@uni-bamberg.de](mailto:michael.mendler@uni-bamberg.de)

## 9 Computer Labs & icprint

Students have access to computers at various university locations.

### 9.1 Finding PC-Pools

At the ERBA, you can find computers in rooms WE5/01.003; WE5/02.005; WE5/04.014 (see the plan of the building on p. 35). Further information on all university computer labs and their particular software configuration can be found at <http://www.uni-bamberg.de/rz/pc-pools/>. You also have wireless internet access in all of the computer labs (see subsection 10.2).

### 9.2 Rules of Conduct for Computer Labs

By logging agree to the policies concerning information systems at the University of Bamberg. You can find the policies in the Computing Centre (*Rechenzentrum*) and in all computer labs. Also, the policies are published online at <http://www.uni-bamberg.de/fileadmin/rz/allgemeines/Nutzungsregelungen-PC-Pools.pdf>. The times that you can access the computer labs are limited to the opening hours of the respective building. Lectures and lab classes that are conducted in computer labs have priority over personal use. (Lectures are announced on the displays at the entrance of the Computing Center and the ERBA building). Students not attending the lecture or lab class should be prepared to finish their work with the computer early enough to make space for students who are going to attend the lecture. This should be done even if there are more computers than students attending the lecture. Please also leave the computer lab if a lecturer or a costodian asks you to do so.

### 9.3 icprint - Central Printing and Scanning Service

Printers connected to icprint are accessible via network as printer, copier and scanner at several locations. Printing and scanning require your student ID card. The icprint-LoginApp, which is needed for printing, is installed on all lab computers. You are logged in by default. Via [icprint.uni-bamberg.de](http://icprint.uni-bamberg.de) you can access your scanned documents.

## 10 Internet Access for Students

### 10.1 BA Number

The so called BA number you received with your enrollment at the Office of the Academic Registrar, in combination with your password, grants you access to various online services of the University of Bamberg (e.g. VC, FlexNow2, "online services" or Office365, access to computers in the computer labs, VPN connection). Your user ID starts with the letters "ba" followed by a six-digit number. If you forget your password, please contact the Computing Centre's IT-Support: room RZ/00.13, Phone +49 951 863 1333. You will need your student ID card.

### 10.2 Internet Access in University of Bamberg Buildings

All lecture rooms, seminar rooms and important lounge areas (including canteens and libraries) are provided with WiFi access points. Use the SSID "eduroam" to access WiFi at the University of Bamberg. Via this eduroam account you can also access WiFi at other universities which participate in the eduroam project. You find more information on setting up eduroam at <http://www.uni-bamberg.de/rz/eduroam/> .

Important: When accessing WiFi in the eduroam network, please enter your username as **ba-identification@uni-bamberg.de** and the corresponding password.

#### 10.2.1 VPN Connection: Accessing the University Network Externally

To access the university network from an external location you have to establish a so called VPN connection. You need this for some specific library services (like E-Books) and for accessing the file server. For logging in, you need your personal BA number and the corresponding password. Details and information are provided on the following website:

<http://www.uni-bamberg.de/rz/vpn>

### 10.3 Further Computing Centre Services

Further instructions: <http://www.uni-bamberg.de/rz/anleitungen/>

Information about Office365: <http://www.uni-bamberg.de/rz/o365>

Computer courses for students:

<http://www.uni-bamberg.de/rz/dienstleistungen/kurse/computerkurse-fuer-studierende/>

## 11 Fachschaftsvertretung WIAI

The faculty students representatives (*Fachschaftsvertretung WIAI*) represent all students of the WIAI faculty. Sending delegates to boards and committees at different levels of university government, we voice student interests, wishes and concerns. We help you with any issues concerning the university administration, professors or teaching staff. We also assist you in your studies by providing old exam papers, lecture notes, learning aids and the like.

Furthermore, we organise events that enrich student life at our faculty: the  $\LaTeX$ -Workshop at the beginning of the semester; an excursion to the computer expo CeBIT; LAN parties; a summer barbecue; the faculty Christmas party; and a formal dance.



In order to give you the best support possible, we need your help and your feedback. So come and talk to us whenever you encounter problems with your examination regulations (*Prüfungsordnung*), the scheduling of your classes or if there are any other issues or troubles with your studies, university life or your stay in Bamberg. We can most likely help you sort things out or point you in the right direction.

Take a look at our website for useful information about your studies and for announcements concerning our workshops and events. On the Virtual Campus join the course *Aktuelle Informationen der Fachschaft* to stay up to date. For questions and suggestions, send us an email at ✉ [fachschaft-wiai.stuve@uni-bamberg.de](mailto:fachschaft-wiai.stuve@uni-bamberg.de) or give us a call at ☎ 0951 / 863-1219. You are also very welcome to drop by our office in room WE5/02.104.

Would you like to join us, getting to know our faculty and university government or organising events and workshops? Our weekly meetings are open to the public and our doors are (almost) always open.

**We look forward to meeting you!**

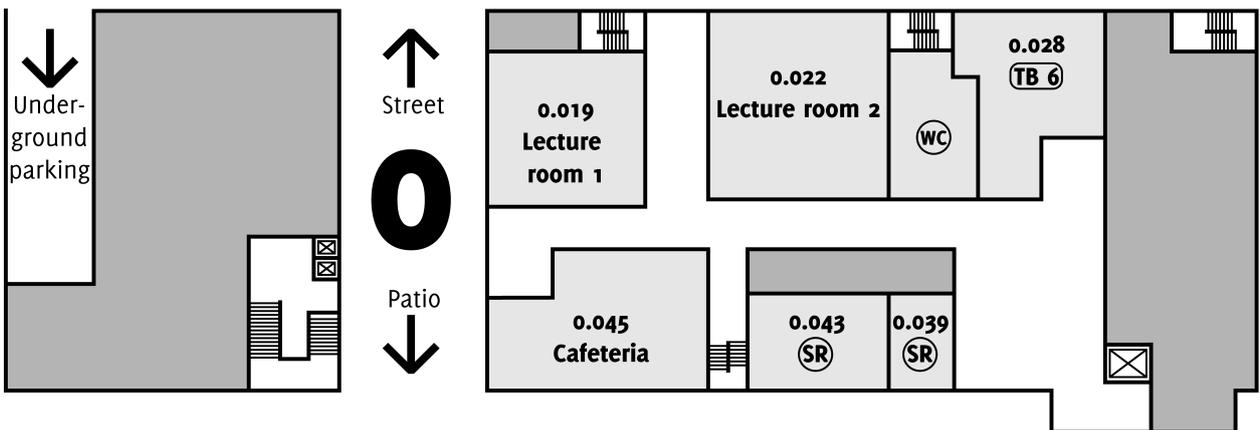
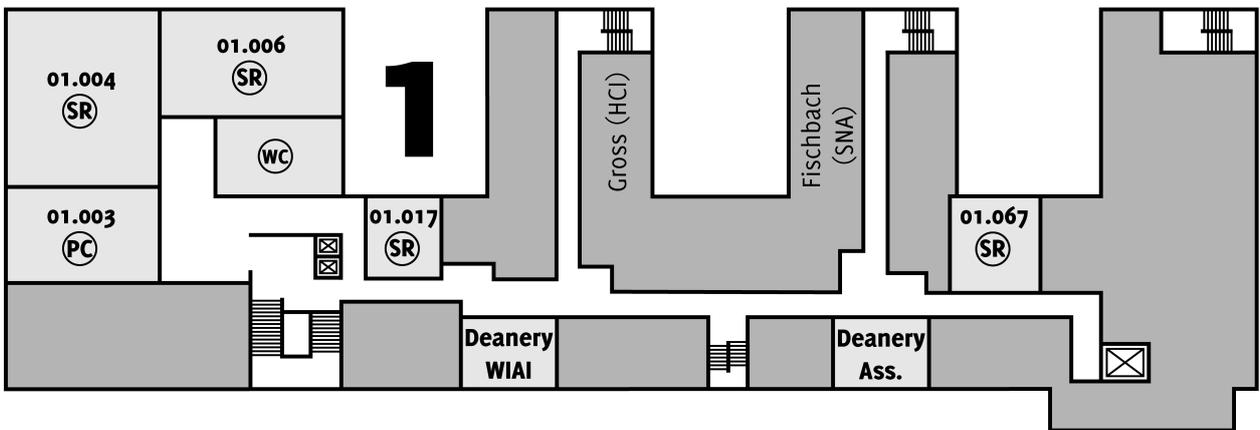
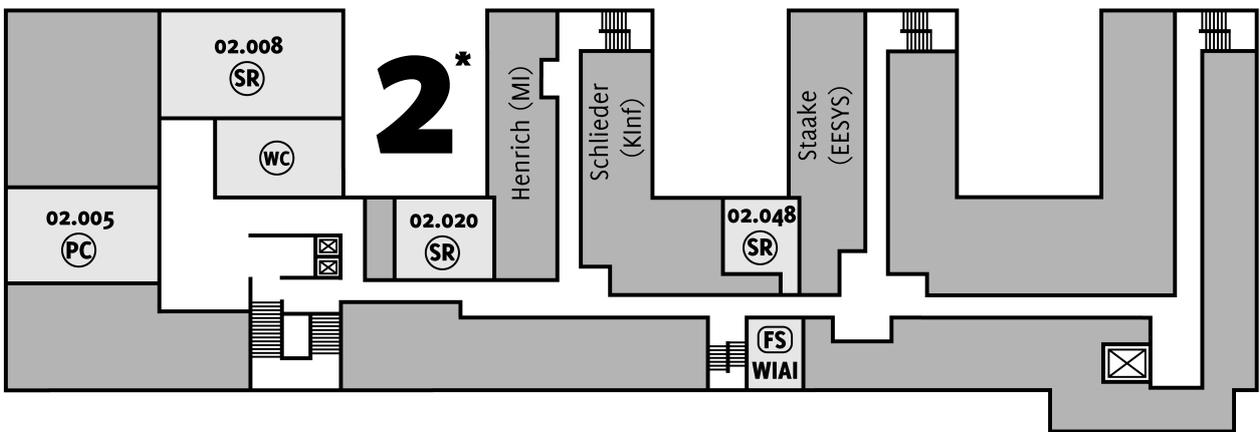
**The WIAI student representatives wish you  
success in your studies and a great time at our university!**

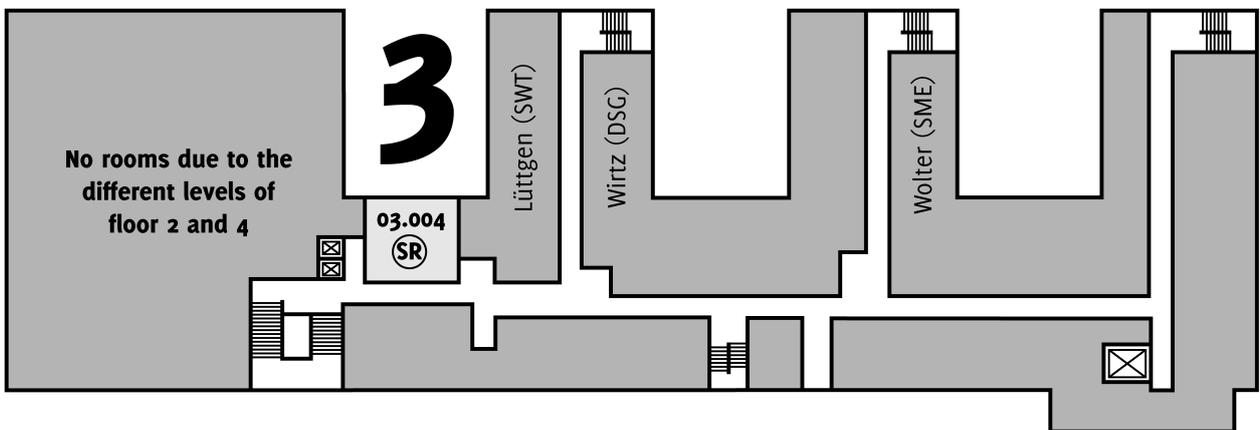
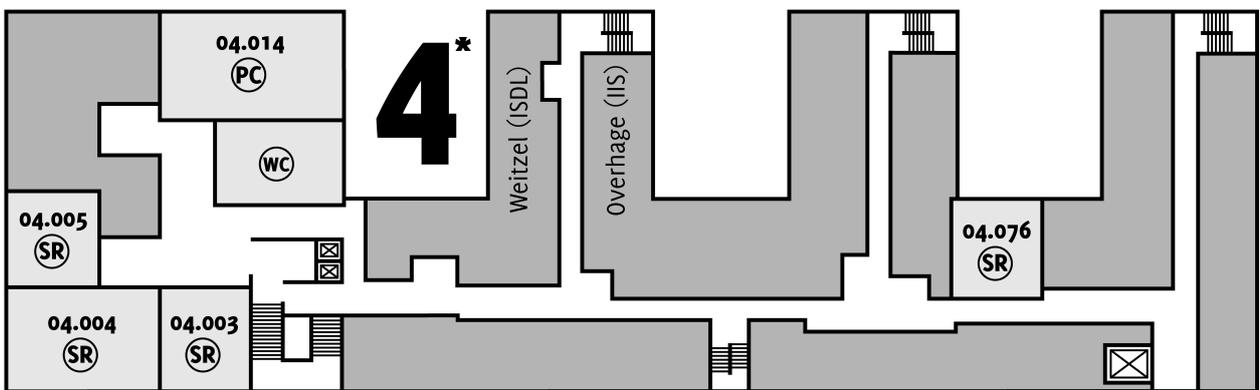
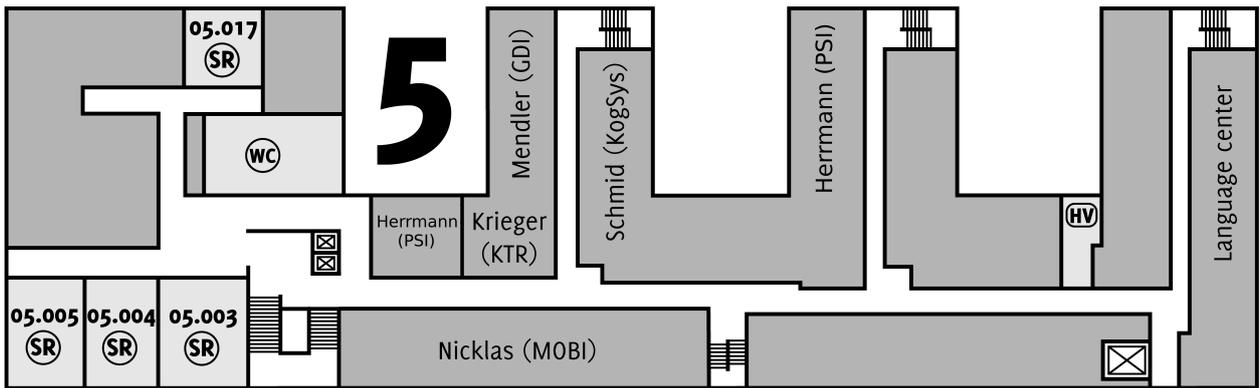


<http://www.uni-bamberg.de/wiai/fs/>  
<https://vc.uni-bamberg.de/moodle/course/view.php?id=284>

Room: WE5/02.104

# 12 Map of the ERBA Campus





**Key:**

- |                                  |           |
|----------------------------------|-----------|
| Seminar rooms                    | Elevators |
| Public restrooms                 | CIP pools |
| ERBA library                     |           |
| Student association, room 02.104 |           |
| Property management, room 05.079 |           |

\* Different levels, therefore there are 2 elevator stops for passenger elevator

This scheme  
was created and provided by



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[www.feki.de](http://www.feki.de)

## 13 Bus Connections

The following list shows the most important bus lines for students of the WIAI faculty.

- Line 906: Bamberg ZOB ↔ Gaustadt Spinnerei
- Line 907/914/915: Bamberg ZOB ↔ Bamberg Feldkirchenstraße (via Bamberg Bahnhof [train station])
- Line 925: Gaustadt Regensburger Ring ↔ Bamberg Feldkirchenstraße

Further information can be found on the official timetables located at the bus stops or online: <https://www.vgn.de/en/>. Alternatively, you can use the official VGN app available for Android and IOS (<https://vgn.de/en/service/app/>).

## Notes

## Notes

## Notes

## 14 Publishing Information

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Furthermore, the respective chapters are the responsibility of the following authors:

Chapter 0	Introduction	Dean Faculty WIAI
Chapter 1	Otto-Friedrich-University Bamberg	Department Z/KOM - Communication & Alumni
Chapter 2	Faculty WIAI	Dean
Chapter 3	Introduction International Software Systems Science	Programme Advisory Service
Chapter 4 (to 4.8)	Studies and Exam System - General Part	Dean of Studies
Chapter 4 (from 4.9)	Studies and Exam System	Degree Programme Representative
Chapter 5	Creating a Timetable	Degree Programme Advisor
Chapter 6	eLearning	Dean of Studies & VHB Representative
Chapter 7	Languages	International Affairs Representative
Chapter 8	Internship / Graduate Study Abroad	International Affairs Representative
Chapter 9	PC-Pools & icprint	CIP Representative
Chapter 10	Internet Access for Students	Counsellor RZ
Chapter 11	WIAI Student Representatives	<i>Fachschaft WIAI</i>
Chapter 12	Map of the ERBA Campus	<i>Fachschaft WIAI</i>
Chapter 13	Bus Timetables	<i>Fachschaft WIAI</i>

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Created with  $\LaTeX$ .

Date: May 13, 2019