

Syllabus  
**BAE2432 Information Technology 2**  
Prof. Dr. Raphael Volz  
Winter Semester 2024/25

<b>Level</b>	Bachelor	
<b>Credits</b>	3	
<b>Student Contact Hours</b>	2	
<b>Workload</b>	90 hours	
<b>Prerequisites</b>	Module Computer Science (BAE 1130) Module IT-applications (BAE2030)	
<b>Time</b>	s. LSF	
<b>Room</b>	s. LSF	
<b>Start Date</b>	s. LSF	
<b>Lecturer(s)</b>	<b>Name</b>	Prof. Dr. Raphael Volz
	<b>Büro</b>	T2.3.15
	<b>Virtuelles Büro</b>	<a href="#">Virtuelles Büro Prof. Volz</a>
	<b>Kolloquium</b>	Donnerstag, 15:30-17:00
	<b>Telefon</b>	07231 28-6692
	<b>Email</b>	<a href="mailto:raphael.volz@hs-pforzheim.de">raphael.volz@hs-pforzheim.de</a>

## Summary

The lecture is about the exchange of data between people, systems and applications and explains how the modern Internet works using standard protocols and data formats. Data formats are rooted in formal languages and automata theory as well as data structures, which are also explained in the lecture. Examples are given in JavaScript using the node.js web application server and popular JavaScript application frameworks like express.js.

## Outline of the Course

The lecture is divided in two parts and presents important conceptual aspects of modern IT applications in enterprises:

1. Foundations of communication between applications using Internet technologies, ISO/OSI layered network model, important Internet protocols (IP, TCP/UDP, HTTP).
2. Data formats: Formal languages and grammars (EBNF), exchanging data using text-based formats (XML, DTD, JSON). Basics of information theory for efficient encodings in binary formats (Google Protocol Buffers / Apache Thrift).

## Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

Program Intended Learning Outcomes	Course Intended Learning Outcomes
After completion of the program the students will be able...	After completion of the course the students will be able...
<b>1 Expert Knowledge</b>	
1.7 ...to demonstrate their solid key knowledge in Computer Science.	...Kommunikation und Datenhaltung in verteilten Anwendungen zu identifizieren.
1.8 ...to demonstrate profound expert knowledge in their field of specialization.	
<b>2 Digital Skills</b>	
2.1 ...to know and understand relevant IT software tools used in business and their features and have a solid understanding of digital technologies.	...Werkzeugen für Netzwerkanalyse einzusetzen.
<b>3 Critical Thinking and Analytical Competence</b>	
<b>4 Ethical Awareness</b>	
<b>5 Communication and Collaboration Skills</b>	
<b>6 Internationalization</b>	

## Teaching and Learning Approach

The knowledge transfer is carried out by an interactive talk with slides and complementing lecture notes. The slides are available as course material. Exercises and discussions during the course consolidate the knowledge. A suitable preparation and revision of the treated topics are essential for learning success.

Recommendations for the lecture and for the use of the Course material:

- Try hard to follow the lecture, pay attention and involve yourself in the discussion
- Make your own notes
- Ask questions
- Self-study based on the course material using additional literature and internet information sources

The teacher will do anything to help you learn the subject as well as its real world implications. If you have problems or questions, please speak up in class. If you do not want to ask in class, please e-mail.

### **Literature and Course Materials**

Download location of course material is found in the eLearning System (LMS).

The university library hosts a collection of books on the lecture topics and is well worth a visit.

### **Assessment**

There will be a 60-minute written examination on the module Information Technology (combination of IT1 and IT2)

'Sehr gut' represents exceptional work, far above average. 'Gut' represents good work, above average. 'Befriedigend' represents average work. 'Ausreichend' represents below average work with considerable shortcomings. And 'mangelhaft' is just exceptional work in the wrong direction or with unacceptable shortcomings.

### **Schedule**

N/A

### **Academic Integrity and Student Responsibility**

Students are encouraged to discuss the course, including issues raised by the assignments. However, the solutions to assignments should be individual original work unless otherwise specified. If an assignment makes you realize you don't understand the material, ask a fellow student a question designed to improve your understanding, not one designed to get the assignment done. To do otherwise is to cheat yourself out of understanding, as well as to be intolerably dishonorable.

Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Failure to do so is plagiarism and will necessitate disciplinary action.

### **Code of Conduct for Students**

- Read the syllabus
- Be on time and don't leave the lectures/exercises early
- Care for a pleasant atmosphere (i.e. silence)
- Ask questions if you don't understand something
- Build up your knowledge continuously
- Practice fair play to the other students

[Link to the Code of Conduct for online Teaching](#)

## **Teaching Philosophy**

I care about your learning experience and helping you to achieve a good study result is important to me. Do not hesitate to ask questions by email, I typically answer within 48 hours, if the email has a subject and basic rules of courtesy are met.

I will do anything to help you learn the subject as well as its real world implications. If you have problems or questions, please speak up in class, send me an e-mail or see me at my office. If you have problems with your progress in the course or with a fellow student please see me as early as possible. I really want you to graduate, but you must earn it!

I do anything I can to help you as long as I can extend the same treatment to other students in the class. Please do not ask for unfair treatment. I really care about you as students and as human beings, but I do not give grades away.

## **Additional Information**

**Language:** English

### **Learning Objectives:**

Students shall understand

- Communication on the Internet using Internet protocols
- Basics of distributed systems architecture based on Internet-based networking and data exchange
- Overview of important data formats used today and their theoretical foundations (formal languages / grammars and information theory)
- Benefits and drawbacks of using a given data format.