Nets4Cars / Nets4Trains / Nets4Aircraft 2014 in Offenburg

6th International Workshop on Communication Technologies for Vehicles
6th - 7th May 2014 Offenburg, Germany

Organized by

Hochschule Offenburg
University of Applied Sciences

Faculty of Electrical Engineering and Information Technology,
Offenburg University of Applied Sciences, Germany

Supported by

IFSTTAR

The French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR)
Lille - Villeneuve d'Ascq, France

HÖGSKOLAN I HALMSTAD

Halmstad University, Sweden

Sponsored by

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An activity of

Eine Initiative des Bundesministeriums für Bildung und Forschung

Wissenschaftsjahr 2014
DIE DIGITALE GESELLSCHAFT

Contents

Preface

The Communication Technologies for Vehicles Workshop series provides an international forum on the latest technologies and research in the field of intra- and inter-vehicles communications and is organized annually to present original research results in all areas related to physical layer, communication protocols and standards, mobility and traffic models, experimental and field operational testing, and performance analysis.

First launched by Tsutomu Tsuboi, Alexey Vinel, and Fei Liu in Saint Petersburg, Russia (2009), Nets4Cars workshops have been held in Newcastle-upon-Tyne, UK (2010), Oberpfaffenhofen, Germany (2011), Vilnius, Lithuania (2012) and Villeneuve d'Ascq, France (2013). These proceedings contain the papers presented at the 6th International Workshop on Communication Technologies for Vehicles (Nets4Cars- Nets4Trains-Nets4Aircraft 2014), which took place at Offenburg University of Applied Sciences, Germany, in May 2014, with the technical support of IFSTTAR, France and Halmstad University, Sweden. The sponsor of the event is Alcatel-Lucent Stiftung für Kommunikationsforschung.

Our call for papers resulted in 15 submissions. Each of them was assigned to the Technical Program Committee members and 10 submissions were accepted for publication. Each accepted paper got at least two independent reviews. In addition, four invited papers were accepted. The order of the papers in these proceedings corresponds to the workshop program.

This year the keynote speakers are:

- Hans-Peter Mayer "Car Specific Services in 5G Frameworks," Lead Next Generation Wireless, Bell Labs, Stuttgart, Germany
- Thomas Hogenmüller "Overview and challenges of automotive E/E-Architecture with Ethernet," Team Manager E/E-Architectures Communication Technologies and Gateways, R. Bosch GmbH, Stuttgart, Germany
- Torsten Braun "Routing Protocols for and Deployment of Flying Ad-hoc Networks," Professor of Computer Science, University of Bern, Switzerland
- Marion Berbineau "Wireless Communications for Railway applications: state of knowledge and future trends," Research Director, Deputy Manager COSYS Department (COmponents and SYStems), IFSTTAR, France

We extend a sincere "thank you" to all the authors who submitted the results of their recent work, to all the members of our hard-working comprehensive Technical Program Committee, as well as the thoughtful external reviewers. Also, we extend a special "thank you" to Nikita Lyamin for the preparation of the proceedings and Bertram Birk for managing the website. We invite all the experts in the field to join us in St.-Petersburg, Russia, for Nets4Cars-Fall in October 2014.

May 2014

Committees

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Teresa Vazão, Instituto Superior Técnico, Portugal
Michelle Wetterwald, EURECOM, France

Dear participants

of the 6th International Workshop on Communication Technologies for Vehicles (Nets4Cars / Nets4Trains / Nets4Aircraft 2014)

It is my pleasure to welcome you at the Department of Electrical Engineering and Information Technology of Offenburg University of Applied Sciences. I am glad that the 6th International Workshop Nets4Cars/Nets4Trains/Nets4Aircraft 2014, is staged in Offenburg University.

I hope that the nice ambience, the university is surrounded by, the high level of performance in our laboratories and the many kind people who work and study here inspire you to pass a very interesting and successful workshop. I am sure that every attendant will give his best to realize these goals.

Now it´s your turn to discuss about the latest insight, theory and methods in the field of Communication Technologies for Vehicles for improving the state of the art in this area, for deepening your knowledge and for establishing new and refreshing existing personal contacts.

Finally I would like to wish you a pleasant stay in Offenburg and its university.

With kind regards

Prof. Dr.-Ing. habil. Uwe Nuß
Dean of the Department of Electrical Engineering and
Information Technology of Offenburg University of Applied Sciences

E+I Elektrotechnik und Informationstechnik

Hochschule Offenburg
University of Applied Sciences

Workshop Timetable

Workshop Day 1: Tuesday, 6th May 2014

	Begin		Location
Registration	09:30	Please follow the signs for **Nets4Cars / Nets4Trains / Nets4Aircraft**	Gallery Building B
Welcome messages	10:30		Lecture hall B 121
Keynotes	10:45		Lecture hall B 121
Lunch break	12:15		University restaurant
Session 1	13:15	Automotive Issues	Lecture hall B 121
Coffee break	15:00		Gallery Building B
Session 2	15:30	Car to Car	Lecture hall B 121
Start for city tour	17:30		
City tour	18:00		Gengenbach
Workshop dinner	19:30	Restaurant Pfeffermühle http://www.stadthotel-gengenbach.de/ 8-0-Restaurant.html	Victor-Kretz-Straße 17, D77723 Gengenbach

Workshop Day 2: Wednesday, 7th May 2014

	Begin		Location
Keynotes	09:00		Lecture hall B 121
Coffee break	10:30		Gallery Building B
Session 3	11:00	Aviation Issues	Lecture hall B 121
Lunch break	12:45		University restaurant
Session 4	13:15	In-Car	Lecture hall B 121
Coffee break	14:15		Gallery Building B
Session 5	14:45	Infrastructures	Lecture hall B 121
Wrap up	16:30		

Workshop Day 1: Tuesday, 6th May 2014

Keynote		
Car Specific Services in 5G Frameworks	Hans-Peter Mayer, Lead Next Generation Wireless	Bell Labs, Stuttgart, Germany
Keynote		
Overview and challenges of automotive E/E-Architecture with Ethernet	Thomas Hogenmüller Team Manager E/E-Architectures Communication Technologies and Gateways	R. Bosch GmbH, Stuttgart, Germany
Session 1 „Automotive Issues“ *Session Chair:* Alexey Vinel (Halmstad University, Sweden)		
Evaluation of WiFi for kart racing monitoring	Harri Viittala (University of Oulu, Finland); Matti Hämäläinen (University of Oulu, Finland); Jari Iinatti (University of Oulu, Finland); Simone Soderi (University of Oulu & GE Transportation Systems SpA, Italy)	
Automated RF Emulator for a highly scalable IEEE802.11p communication and localization subsystem	Axel Sikora (University of Applied Sciences Offenburg, Germany); Lars Moellendorf (Steinbeis Transfer Centre Embedded Design and Networking, Germany); Manuel Schappacher (Steinbeis Innovation Center Embedded Design and Networking, Germany)	
IEEE802.15.4 based Wireless Sensor Network for Automotive Test and Measurement Applications with Predictable Frequency Agility	Michael Binhack (SenTec Elektronik GmbH, Sweden); Gerald Kupris (Deggendorf Institute of Technology, Germany)	
Session 2 „Car to Car“ *Session Chair:* Tsutomu Tsuboi (City Development & Public Interest Incorporated Foundation Hamamatsu Agency for Promoting Innovation, Japan)		
Context-Aware Retransmission Scheme for Reliability in Platooning Applications	Annette Böhm (Halmstad University, Sweden); Magnus Jonsson (Halmstad University, Sweden); Kristina A. K. Kunert (CERES, Halmstad University & ISS, Mälardalen University, Sweden); Alexey Vinel (Halmstad University, Sweden)	
An Improved Relevance Estimation Function for Cooperative Awareness Messages in VANETs	Jakob Breu (Daimler AG, Germany); Michael Menth (University of Tuebingen, Germany)	
Evaluation of performance Enhancement for Crash Constellation Prediction via C2C Communication	Thomas Kuehbeck (BMW AG, Germany); Gor Hakobyan (University of Applied Sciences Offenburg, Germany); Axel Sikora (University of Applied Sciences Offenburg, Germany); Claude C. Chibelushi (Staffordshire University, United Kingdom); Mansour Moniri (Staffordshire, United Kingdom)	

Workshop Day2: Wednesday, 7th May 2014

Keynote		
Wireless Communications for Railway applications: state of knowledge and future trends	Marion BERBINEAU, PhD, Research Director, Deputy Manager COSYS Department (COmponents and SYStems)	IFSTTAR, France
Keynote		
Routing Protocols for and Deployment of Flying Ad-hoc Networks	Prof. Dr. Torsten Braun Head of CDS research group (Communication and Distributed Systems)	University Bern, Switzerland
Session 3 „Aviation Issues“ *Session Chair:* Marion Berbineau (IFSTTAR, LEOST & University Lille Nord de France, France)		
Performance Evaluation of an Ethernet-based Cabin Network Architecture Supporting a Low-Latency Service	Fabien Geyer (Airbus Group Innovations, Germany); Stefan Schneele (Airbus Group Innovations, Germany); Wolfgang Fischer (Airbus Operations GmbH, Germany)	
Aeronautical Ad Hoc Network for Civil Aviation	Quentin Vey (ENAC, France); Alain Pirovano (ENAC, France); Jose Radzik (ISAE - Institut Supérieur de l'Aéronautique et de l'Espace, France); Fabien Garcia (ENAC, France)	
A DDS-based Middleware for Cooperation of Air Traffic Service Units	Erwin Mayer (University of Applied Sciences Offenburg, Germany); Johannes Fröhlich (University of Applied Sciences Offenburg, Germany)	
Session 4 „In Car“ *Session Chair:* Torsten Ingo Braun (University of Bern, Switzerland)		
Reliability Analysis of ZigBee based Intra-vehicle Wireless Sensor Networks	Md Arafatur Rahman (Postdoctoral Research Fellow, Italy)	
Attack Potential and Efficient Security of Automotive Bus Networks using Short MACs with Rapid key Change	Sebastian Bittl (Fraunhofer ESK, Germany)	
Session 5 „Infrastructures“ *Session Chair:* Axel Sikora (University of Applied Sciences Offenburg, Germany)		
Optimization for Wireless Vehicular Network System in Urban Area	Tsutomu Tsuboi (City Development & Public Interest Incorporated Foundation Hamamatsu Agency for Promoting Innovation, Japan); Sekiguchi Tatsuya (the University of Tokyo, Japan)	
LTE micro-cell deployment for high-density railway areas	Aleksander Sniady (Technical University of Denmark, Denmark); Mohamed Kassab (IFSTTAR, LEOST & Univ Lille Nord de France, France); Jose Soler (Technical University of Denmark, Denmark); Marion Berbineau (IFSTTAR, LEOST & University Lille Nord de France, France)	
Live Video Streaming in Vehicular Networks	Alexey Vinel (Halmstad University, Sweden); Evgeny Belyaev (Tampere University of Technology, Finland); Boris Bellalta (Universitat Pompeu Fabra, Spain); Honglin Hu (Shanghai Research Center for Wireless Communications, P.R. China)	

Registration

The Registration desk is open at the University Campus, Badstrasse 24, 77652 Offenburg, gallery building B. Please follow the signs for **Nets4Cars / Nets4Trains / Nets4Aircraft**

- Tuesday, May 6, from 9:30 to 17:15
- Wednesday, May 7, from 9:00 to 16:30

Internet Access

Nets4cars… will provide free Wi-Fi Internet access for every participant with their own laptop.

Users might register to the unsecured WLAN "fho-weblogin", then start any browser and open any unencrypted web-page. This request will be redirected to a captive portal, where IDAACS participants might use the following credentials:

- user name: Nets4_2014
- password: Nets4CTA

Nets4Cars-2014 Venue

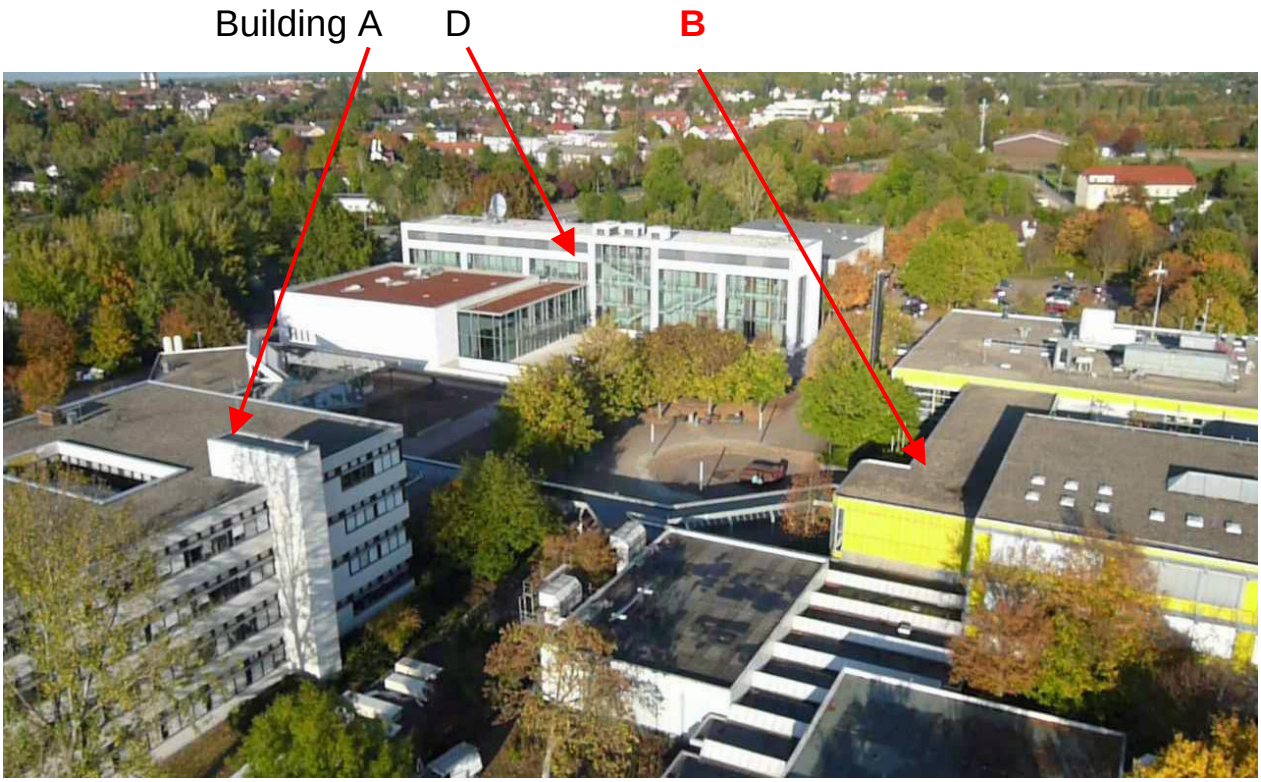
University Campus (Badstrasse 24, 77652 Offenburg)

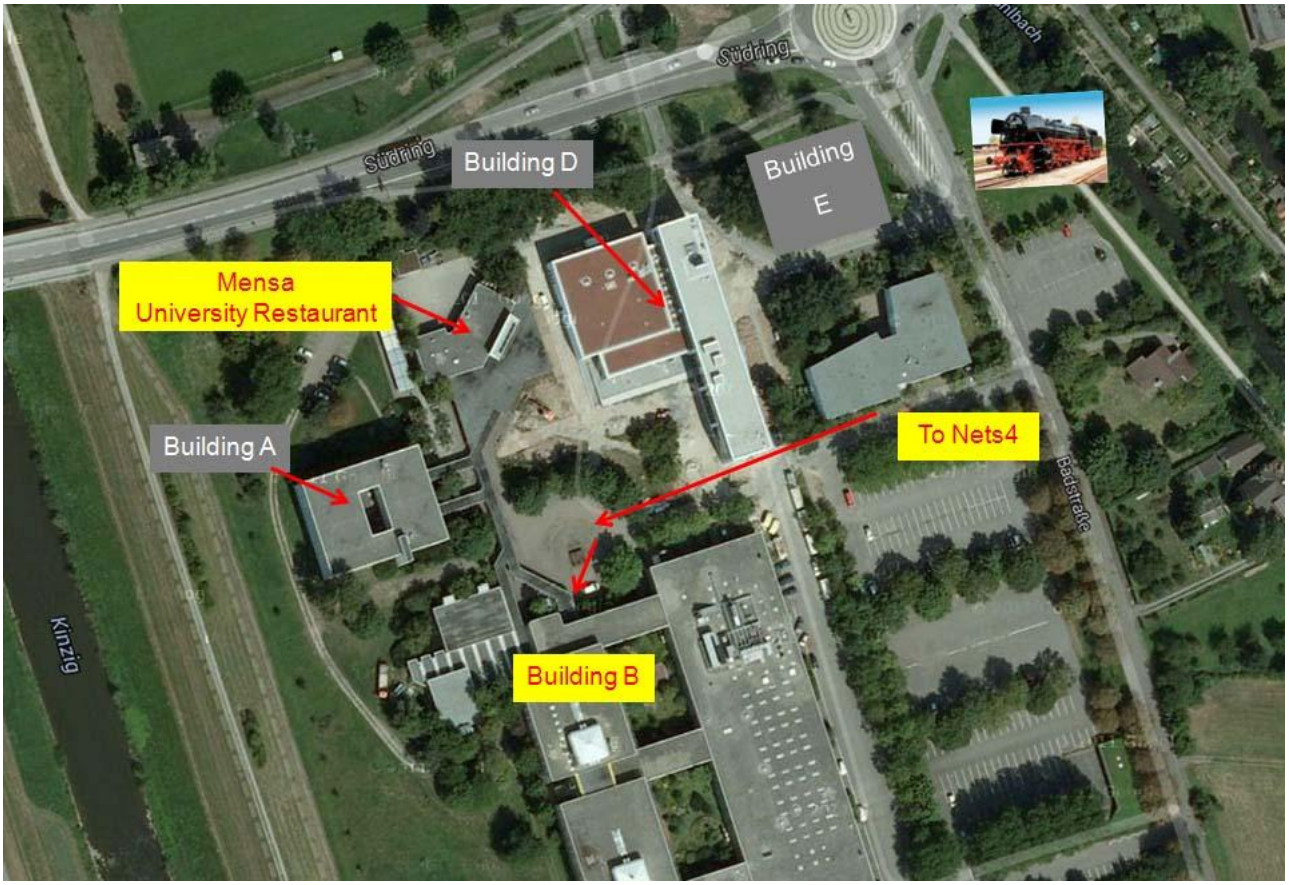
Founded in 1964, the Offenburg University of Applied Sciences quickly established itself as an impressive and high performance educational institution. Originally founded as the "National School of Engineering", our University has developed into a thriving community, with more than 4,200 students on two different campuses. It offers both Bachelor's and Master's degrees in four different departments: Business Administration and Industrial Engineering, Electrical Engineering and Information Technology, Mechanical Engineering and Process Engineering, and Media and Information.

Offenburg University of Applied Sciences prides itself on the international orientation of its programs. In 1998, the University was one of the first institutions of higher education in Germany to introduce international Master's Degree Programs through its Graduate School. Today, five different programs are offered, all of which cater especially to international students, whom comprise twelve percent of our student body. Additionally, the International Office maintains active exchange programs with more than 50 partner universities worldwide, giving students more opportunities at study and internships abroad. Due to the proximity with the French border, there are also double degree programs with prestigious French universities.

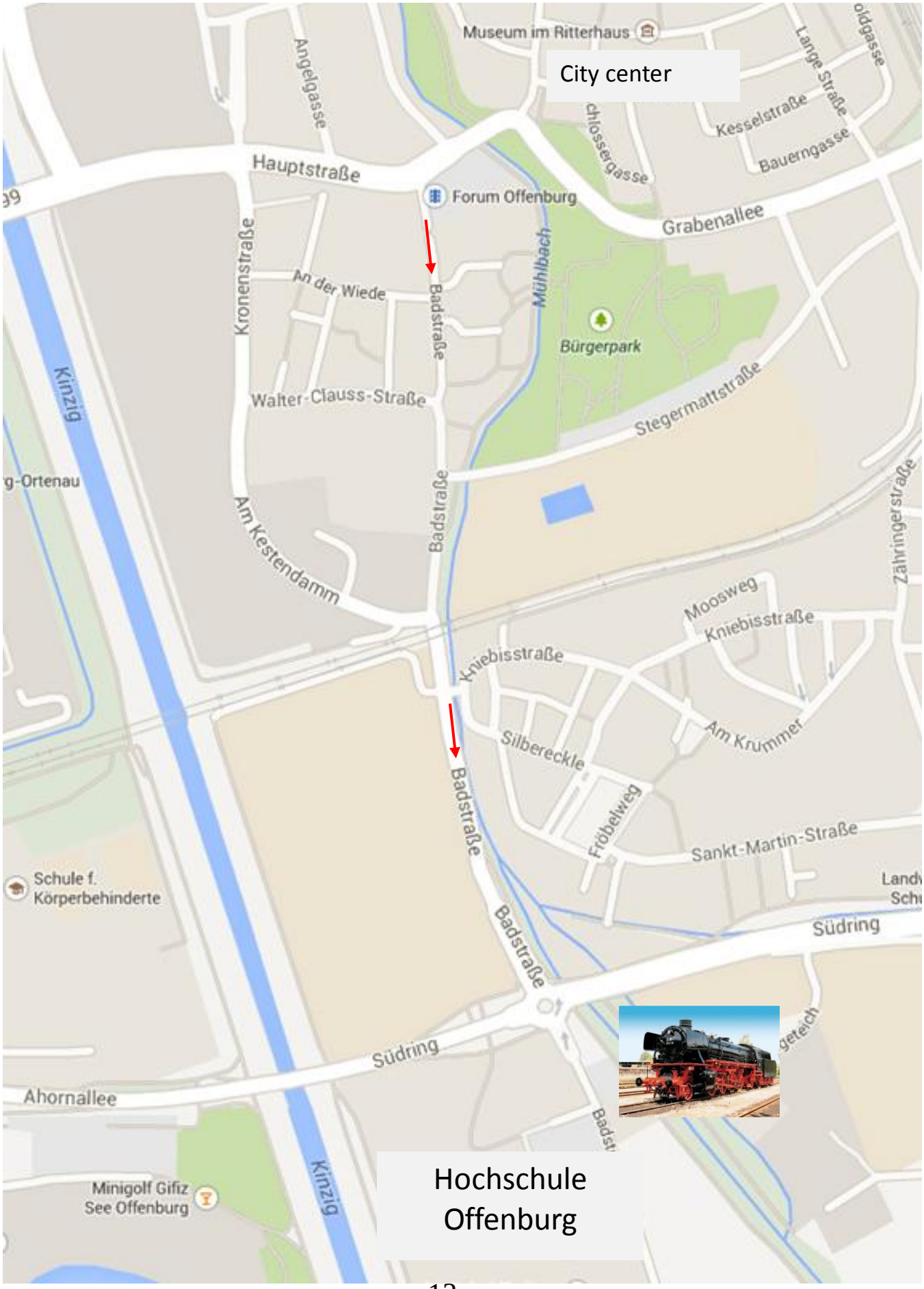
The university campus is around 1.5 km south of the city center. It can be walked (although not very scenic ….). Alternatively, bus line can be taken. Best choice from city center and central bus station (ZOB) are bus lines S8 and S10 (see below).

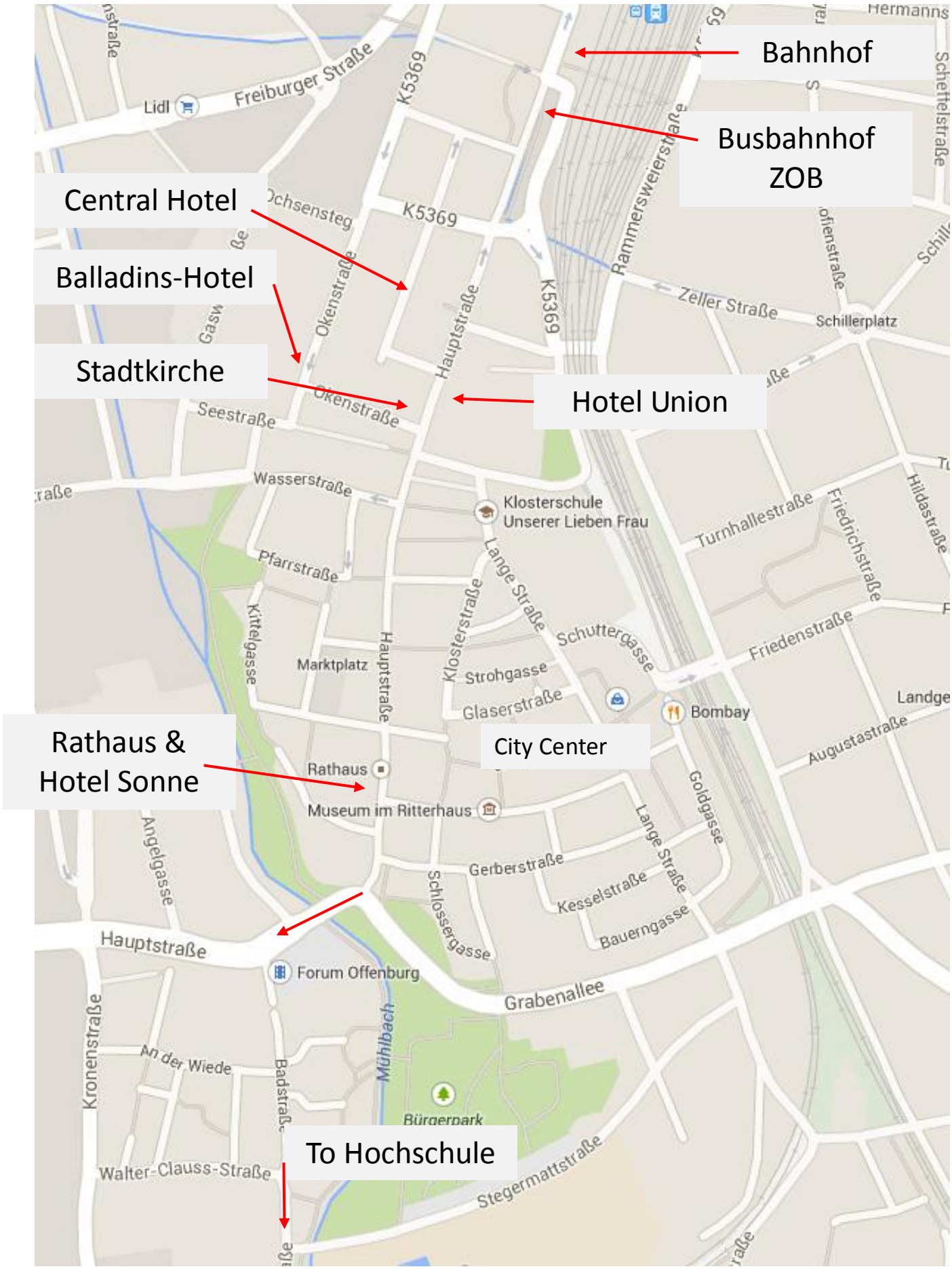
Main campus of University of Applied Sciences Offenburg
Badstrasse 24, 77652 Offenburg





Maps of Offenburg




Bahnhof
Busbahnhof ZOB
Central Hotel
Balladins-Hotel
Stadtkirche
Hotel Union
Rathaus & Hotel Sonne
City Center
To Hochschule
Lidl
Freiburger Straße
K5369
Okenstraße
Hauptstraße
Rammersweierstraße
Zeller Straße
Schillerplatz
Seestraße
Wasserstraße
Klosterschule Unserer Lieben Frau
Turnhallestraße
Friedrichstraße
Hildastraße
Pfarrstraße
Kittelgasse
Marktplatz
Klosterstraße
Lange Straße
Schuttergasse
Friedenstraße
Strohgasse
Glaserstraße
Bombay
Augustastraße
Rathaus
Museum im Ritterhaus
Goldgasse
Angelgasse
Gerberstraße
Kesselstraße
Bauerngasse
Schlossergasse
Forum Offenburg
Grabenallee
Kronenstraße
An der Wiede
Mühlbach
Badstraße
Bürgerpark
Walter-Clauss-Straße
Stegermattstraße

Bus Connections S8 from Offenburg ZOB or City Center to University

valid from Mon till Fri

S 8 

Tagmess - Oberrheinisches Pflege- Therapiezentrum - Bahnhof/ZOB - Rathaus - Kreisschulzentrum - Hochschule - Uffhofen - Hildboltsweier ←

Offenburger Stadtbus Schlüsselbus GmbH		Montag - Freitag																	
VERKEHRSHINWEIS		23																	
Offenburg An der Tagmess	ab	7.10	7.40	8.00	8.20	9.00	9.20	10.00	10.20	11.00	11.20	12.00	12.20	13.00	13.20	14.00	14.20	15.00	15.20
- Oberrh.Pflege- Therapiezentrum		7.11	7.41	8.01	8.21	9.01	9.21	10.01	10.21	11.01	11.21	12.01	12.21	13.01	13.21	14.01	14.21	15.01	15.21
- Johann-Sebastian-Bach-Straße		7.12	7.42	8.02	8.22	9.02	9.22	10.02	10.22	11.02	11.22	12.02	12.22	13.02	13.22	14.02	14.22	15.02	15.22
- Haydnstraße		7.13	7.43	8.03	8.23	9.03	9.23	10.03	10.23	11.03	11.23	12.03	12.23	13.03	13.23	14.03	14.23	15.03	15.23
- Zur Lindenhöhe		7.14	7.44	8.04	8.24	9.04	9.24	10.04	10.24	11.04	11.24	12.04	12.24	13.04	13.24	14.04	14.24	15.04	15.24
- Auferstehungskirche		7.15	7.45	8.05	8.25	9.05	9.25	10.05	10.25	11.05	11.25	12.05	12.25	13.05	13.25	14.05	14.25	15.05	15.25
- Zeller Straße		7.16	7.46	8.06	8.26	9.06	9.26	10.06	10.26	11.06	11.26	12.06	12.26	13.06	13.26	14.06	14.26	15.06	15.26
- Schillergymnasium		7.17	7.47	8.07	8.27	9.07	9.27	10.07	10.27	11.07	11.27	12.07	12.27	13.07	13.27	14.07	14.27	15.07	15.27
- Turnhallestraße		7.18	7.48	8.08	8.28	9.08	9.28	10.08	10.28	11.08	11.28	12.08	12.28	13.08	13.28	14.08	14.28	15.08	15.28
- Bahnhof / ZOB (Bussteig 3)	an	7.22	7.52	8.12	8.32	9.12	9.32	10.12	10.32	11.12	11.32	12.12	12.32	13.12	13.32	14.12	14.32	15.12	15.32
- Bahnhof / ZOB (Bussteig 3)	ab	7.25	7.55	8.15	8.35	9.15	9.35	10.15	10.35	11.15	11.35	12.15	12.35	13.15	13.35	14.15	14.35	15.15	15.35
- Stadtkirche		7.26	7.56	8.16	8.36	9.16	9.36	10.16	10.36	11.16	11.36	12.16	12.36	13.16	13.36	14.16	14.36	15.16	15.36
- Rathaus		7.30	8.00	8.20	8.40	9.20	9.40	10.20	10.40	11.20	11.40	12.20	12.40	13.20	13.40	14.20	14.40	15.20	15.40
- Zähringerstraße		7.32	8.02	8.22	8.42	9.22	9.42	10.22	10.42	11.22	11.42	12.22	12.42	13.22	13.42	14.22	14.42	15.22	15.42
- Kreisschulzentrum		7.33	8.03	8.23	8.43	9.23	9.43	10.23	10.43	11.23	11.43	12.23	12.43	13.23	13.43	14.23	14.43	15.23	15.43
- Hochschule		7.35	8.05	8.25	8.45	9.25	9.45	10.25	10.45	11.25	11.45	12.25	12.45	13.25	13.45	14.25	14.45	15.25	15.45
- Schumacherbrücke		7.36	8.06	8.26	8.46	9.26	9.46	10.26	10.46	11.26	11.46	12.26	12.46	13.26	13.46	14.26	14.46	15.26	15.46
Uffhofen Platanenallee Nord		7.37	8.07	8.27	8.47	9.27	9.47	10.27	10.47	11.27	11.47	12.27	12.47	13.27	13.47	14.27	14.47	15.27	15.47
Hildboltsweier Pappelweg		7.38	8.08	8.28	8.48	9.28	9.48	10.28	10.48	11.28	11.48	12.28	12.48	13.28	13.48	14.28	14.48	15.28	15.48
- Oberörtle		7.39	8.09	8.29	8.49	9.29	9.49	10.29	10.49	11.29	11.49	12.29	12.49	13.29	13.49	14.29	14.49	15.29	15.49
- Königswaldstraße		7.40	8.10	8.30	8.50	9.30	9.50	10.30	10.50	11.30	11.50	12.30	12.50	13.30	13.50	14.30	14.50	15.30	15.50
- Stockfeld		7.41	8.11	8.31	8.51	9.31	9.51	10.31	10.51	11.31	11.51	12.31	12.51	13.31	13.51	14.31	14.51	15.31	15.51
- Kleingärten	an	7.42	8.12	8.32	8.52	9.32	9.52	10.32	10.52	11.32	11.52	12.32	12.52	13.32	13.52	14.32	14.52	15.32	15.52

23 = am Bahnhof/ZOB Anschluß zum Schulzentrum Nord Linie S 5

Bus Connections S8 from University to City Center or Offenburg ZOB

S 8 

Hildboltsweier - Uffhofen - Hochschule - Kreisschulzentrum - Rathaus - Bahnhof/ZOB - Tagmess - Oberrheinisches Pflege- und Therapiezentrum →

Offenburger Stadtbus Schlüsselbus GmbH		Montag - Freitag																	
VERKEHRSHINWEIS			99																
Hildboltsweier Josefskirche	ab		1 7.05																
- Kleingärten	ab	6.35	7.07	7.35	7.55	8.35	8.55	9.35	9.55	10.35	10.55	11.35	11.55	12.35	12.55	13.35	13.55	14.35	14.55
- Stockfeld		6.36	7.08	7.36	7.56	8.36	8.56	9.36	9.56	10.36	10.56	11.36	11.56	12.36	12.56	13.36	13.56	14.36	14.56
- Königswaldstraße		6.37	7.09	7.37	7.57	8.37	8.57	9.37	9.57	10.37	10.57	11.37	11.57	12.37	12.57	13.37	13.57	14.37	14.57
- Oberörtle		6.38	7.10	7.38	7.58	8.38	8.58	9.38	9.58	10.38	10.58	11.38	11.58	12.38	12.58	13.38	13.58	14.38	14.58
Uffhofen Platanenallee Nord		6.39	7.11	7.39	7.59	8.39	8.59	9.39	9.59	10.39	10.59	11.39	11.59	12.39	12.59	13.39	13.59	14.39	14.59
Offenburg Schumacherbrücke		6.40	7.12	7.40	8.00	8.40	9.00	9.40	10.00	10.40	11.00	11.40	12.00	12.40	13.00	13.40	14.00	14.40	15.00
- Hochschule		6.41	7.13	7.41	8.01	8.41	9.01	9.41	10.01	10.41	11.01	11.41	12.01	12.41	13.01	13.41	14.01	14.41	15.01
- Kreisschulzentrum		6.42	7.14	7.42	8.02	8.42	9.02	9.42	10.02	10.42	11.02	11.42	12.02	12.42	13.02	13.42	14.02	14.42	15.02
- Zähringerstraße		6.44	7.16	7.44	8.04	8.44	9.04	9.44	10.04	10.44	11.04	11.44	12.04	12.44	13.04	13.44	14.04	14.44	15.04
- Rathaus		6.47	7.19	7.47	8.07	8.47	9.07	9.47	10.07	10.47	11.07	11.47	12.07	12.47	13.10	13.47	14.07	14.47	15.07
- Stadtkirche		6.50	7.22	7.50	8.10	8.50	9.10	9.50	10.10	10.50	11.10	11.50	12.10	12.50	13.13	13.50	14.10	14.50	15.10
- Bahnhof / ZOB (Bussteig 7)	an	6.52	7.24	7.52	8.12	8.52	9.12	9.52	10.12	10.52	11.12	11.52	12.12	12.52	13.14	13.52	14.12	14.52	15.12
- Bahnhof / ZOB (Bussteig 7)	ab	6.55	7.27	7.55	8.15	8.55	9.15	9.55	10.15	10.55	11.15	11.55	12.15	12.55	13.15	13.55	14.15	14.55	15.15
- Luisenstraße		6.57	7.29	7.57	8.17	8.57	9.17	9.57	10.17	10.57	11.17	11.57	12.17	12.57	13.17	13.57	14.17	14.57	15.17
- Schillergymnasium		6.58	7.30	7.58	8.18	8.58	9.18	9.58	10.18	10.58	11.18	11.58	12.18	12.58	13.18	13.58	14.18	14.58	15.18
- Laubengasse		6.59	7.31	7.59	8.19	8.59	9.19	9.59	10.19	10.59	11.19	11.59	12.19	12.59	13.19	13.59	14.19	14.59	15.19
- An der Tagmess		◖7.00	◖7.32	8.00	8.20	9.00	9.20	10.00	10.20	11.00	11.20	12.00	12.20	13.00	13.20	14.00	14.20	15.00	15.20
- Oberrh.Pflege- Therapiezentrum		◖7.01	◖7.33	8.01	8.21	9.01	9.21	10.01	10.21	11.01	11.21	12.01	12.21	13.01	13.21	14.01	14.21	15.01	15.21
- Johann-Sebastian-Bach-Straße		◖7.02	◖7.34	8.02	8.22	9.02	9.22	10.02	10.22	11.02	11.22	12.02	12.22	13.02	13.22	14.02	14.22	15.02	15.22
- Haydnstraße	an	◖7.03	◖7.35	8.03	8.23	9.03	9.23	10.03	10.23	11.03	11.23	12.03	12.23	13.03	13.23	14.03	14.23	15.03	15.23

Offenburger Stadtbus Schlüsselbus GmbH		Montag - Freitag																	
Hildboltsweier Kleingärten	ab	15.35	15.55	16.35	16.55	17.35	17.55	18.35	18.55										
- Stockfeld		15.36	15.56	16.36	16.56	17.36	17.56	18.36	18.56										
- Königswaldstraße		15.37	15.57	16.37	16.57	17.37	17.57	18.37	18.57										
- Oberörtle		15.38	15.58	16.38	16.58	17.38	17.58	18.38	18.58										
Uffhofen Platanenallee Nord		15.39	15.59	16.39	16.59	17.39	17.59	18.39	18.59										
Offenburg Schumacherbrücke		15.40	16.00	16.40	17.00	17.40	18.00	18.40	19.00										
- Hochschule		15.41	16.01	16.41	17.01	17.41	18.01	18.41	19.01										
- Kreisschulzentrum		15.42	16.02	16.42	17.02	17.42	18.02	18.42	19.02										
- Zähringerstraße		15.44	16.04	16.44	17.04	17.44	18.04	18.44	19.04										
- Rathaus		15.47	16.07	16.47	17.07	17.47	18.07	18.47	19.07										
- Stadtkirche		15.50	16.10	16.50	17.10	17.50	18.10	18.50	19.10										
- Bahnhof / ZOB (Bussteig 7)	an	15.52	16.12	16.52	17.12	17.52	18.12	18.52	19.12										
- Bahnhof / ZOB (Bussteig 7)	ab	15.55	16.15	16.55	17.15	17.55	18.15	18.55	19.15										
- Luisenstraße		15.57	16.17	16.57	17.17	17.57	18.17	18.57	19.17										
- Schillergymnasium		15.58	16.18	16.58	17.18	17.58	18.18	18.58	19.18										
- Laubengasse		15.59	16.19	16.59	17.19	17.59	18.19	18.59	19.19										
- An der Tagmess		16.00	16.20	17.00	17.20	18.00	18.20	19.00	19.20										
- Oberrh.Pflege- Therapiezentrum		16.01	16.21	17.01	17.21	18.01	18.21	19.01	19.21										
- Johann-Sebastian-Bach-Straße		16.02	16.22	17.02	17.22	18.02	18.22	19.02	19.22										
- Haydnstraße	an	16.03	16.23	17.03	17.23	18.03	18.23	19.03	19.23										

Bus Connections S10 from Offenburg City Center to University

valid from Mon till Fri

S 10 

Offenburg Bahnhof / ZOB - Schulzentrum Nord
oder Kreisschulzentrum - Hochschule

SWEG

		Montag - Freitag																
LINIE		S 5	S10	S 5	S 8	R 2	R 9	R 9	S10	S 8	S 5	S 8	S 5	S 8	S 8	S 8	S 8	S 8
VERKEHRSHINWEIS			S		23	16	SI	SI	S									
Offenburg Bahnhof / ZOB (Bussteig 6)	ab					7.27	7.28	7.30										
Offenburg Bahnhof / ZOB (Bussteig 5)	ab	7.02		7.22							8.02		8.22					
Offenburg Bahnhof / ZOB (Bussteig 3)	ab	|	7.20	|	7.25	|	|	|	|	7.30	7.55	|	8.15	|	8.35	9.15	9.35	10.15	10.35
- Stadtkirche		|	7.21	|	7.26	|	|	|	|	7.31	7.56	|	8.16	|	8.36	9.16	9.36	10.16	10.36
- Rathaus		|	7.25	|	7.30	|	|	|	|	7.35	8.00	|	8.20	|	8.40	9.20	9.40	10.20	10.40
- Schulzentrum Nord	an	7.05	|	7.25	|	7.30	7.31	7.33	|	|	8.05	|	8.25	|	|	|	|	|	|
- Kreisschulzentrum		|	7.28	|	7.33	|	|	|	7.38	8.03	|	8.23	|	8.43	9.23	9.43	10.23	10.43
- Hochschule	an	|	7.30	|	7.35	|	|	|	7.40	8.05	|	8.25	|	8.45	9.25	9.45	10.25	10.45

16 = an Schultagen bis OG Schulzentrum Nord
S = nur an Schultagen
SI = verkehrt nur an Schultagen und bis Offenburg Schulzentrum Nord

23 = am Bahnhof/ZOB Anschluß zum Schulzentrum Nord Linie S 5

Gültig nur an Schultagen

Bus Connections S10 from University to Offenburg City Center

S 10 

Hochschule - Kreisschulzentrum
oder Schulzentrum Nord - Offenburg Bahnhof / ZOB

SWEG

		Montag - Freitag																
LINIE		S 8	S 8	S 8	S10	S 5	S 8	301	S10	S 8	301	S10	S 5	S 8	S 8	S 5	S 8	S 8	S 8
VERKEHRSHINWEIS					S	FA		S FA	S		S	S	FA			FA			
Offenburg Hochschule	ab	11.01	11.41	12.01			12.41			13.01				13.41	14.01		14.41	15.01	15.41
- Kreisschulzentrum		11.02	11.42	12.02	12.10		12.42	12.53	12.55	13.02				13.42	14.02		14.42	15.02	15.42
- Schulzentrum Nord	ab	|	|	|	|	12.47	|	|	|	|	13.10	13.13	13.47	|	|	14.47	|	|	|
- Rathaus		11.07	11.47	12.07	12.15	12.58	12.47	|	13.00	13.10	|	|	13.58	13.47	14.07	14.58	14.47	15.07	15.47
- Stadtkirche		11.10	11.50	12.10	12.18	12.54	12.50	13.06	13.03	13.13	|	|	13.54	13.50	14.10	14.54	14.50	15.10	15.50
- Bahnhof / ZOB (Bussteig 3)	an	|	|	|	12.20	12.50	|	|	13.05	|	|	|	13.50	|	|	14.50	|	|	|
- Bahnhof / ZOB (Bussteig 4)	an	|	|	|	|	|	|	13.03	|	|	13.14	|	|	|	|	|	|	|	|
- Bahnhof / ZOB (Bussteig 7)	an	11.12	11.52	12.12	|	|	12.52	|	|	13.14	|	|	|	13.52	14.12	|	14.52	15.12	15.52
Uffhofen Strandbad						13.02						13.21	14.02			15.02			
- Platanenallee Süd						13.03						13.22	14.03			15.03			
- Stadtteilzentrum						13.04						13.23	14.04			15.04			
- Platanenallee Nord												13.26							
Hildboltsweier Pappelweg												13.27							
- Oberörtle												13.28							
- Königswaldstraße												13.29							
- Stockfeld												13.30							
- Kleingärten	an											13.31							

FA = Haltestellen werden in anderer Reihenfolge angefahren S = nur an Schultagen