

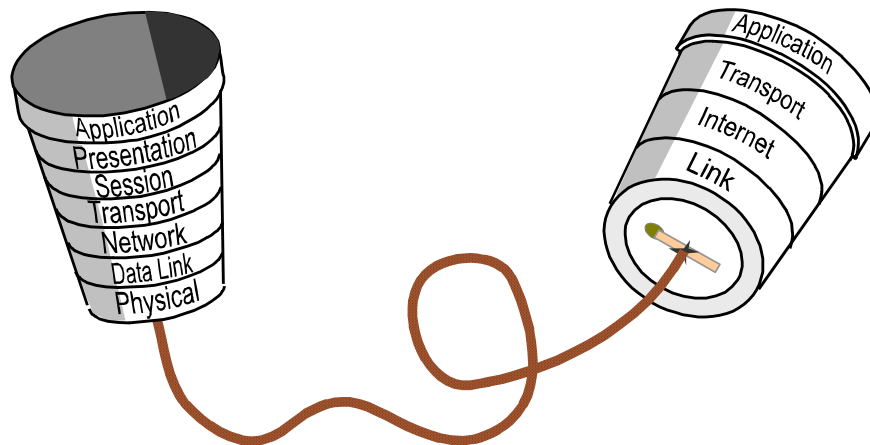
Instructions for the Lab

Communication Systems

&

Wireless Communication Systems

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Introduction

Experiments always start with planning! The time provided for each Lab exercise should be sufficient to do it without hectic – presupposing that you already know what you have to do. As an aid, this instruction book provides some background information and preparation problems.

In order to make your time in the Lab productive and enjoyable, and to avoid misunderstandings, please obey a few rules:

- The preparation problems for each exercise have to be solved and recorded into this instructions book. If necessary, use additional resources from the library or the Internet. At the beginning of each Lab exercise block, the preparation problems will be discussed together with the Lab advisor:

It is expected that each student is thoroughly prepared for each exercise.
The preparation problems have to be solved individually by each student.
The advisors of the Lab will not have time to fill deep gaps of basic knowledge!

- All contents of the Lab can be subject of the final examination of the class *Kommunikationssysteme / Wireless Communication Systems MV06.1*.
- The *Wireless Communication Systems Lab MV06.2* mark is determined by a score on the scale 0...40. For the lab exercises, the preparation and the performing is assessed. The following lab exercises contribute with 25 points in total:

Component	Lab Exercise <i>SPEC</i>	Lab Exercises <i>TCP/IP+VoIP</i>	Lab Exercise <i>BT II</i>	Lab Exercise <i>GSM I + II</i>	Lab Exercise <i>UMTS I + II</i>
Max. Score	5	5	5	5	5

- For each Lab exercise, well working equipment will be provided. If something is missing or broken, please immediately tell the advisors.
- Please note that there is no insurance for any equipment used in the Lab. The value of some items exceeds 10,000 € If you damage equipment by negligence, the University will demand compensation from you.
- After finishing an exercise, please leave your work-place in a tidy condition with the chairs pushed back to the tables.
- An urgent beg:

This is a **hands-on** Lab for you to get **in touch** with modern communication systems.
Please, keep your **hands off** the monitor!

References

Most of the prerequisite knowledge needed for the Lab exercises is taught in the lecture *Communication Systems*. However, some exercises (TCP/IP, VoIP (Voice over IP), and SPEC (*Spectrum Analysis*)) are not covered by the lecture topics. Here it is supposed that you obtain the necessary prerequisite knowledge on your own by utilizing the library of the University and searching for appropriate articles in the Internet. The following resources list gives some hints on reference-books and articles. With each Lab exercise, you find cross links onto these resources, which are appropriate for the special topic:

- [Bad] A. Badach: *VoIP - die Technik*. Hanser, Munich, Germany
- [Blu] www.bluetooth.org: Bluetooth Core Specification 2.0
- [Boc] P. Bocker: *ISDN – Das diensteintegrierende digitale Nachrichtennetz*. Springer
- [Bra] J. Bray, C.F. Sturman: *Bluetooth 1.1, Connect without Cables*. Prentice Hall, USA
- [Com] D.E. Comer: *Internetworking with TCP/IP, Volume 1*. Prentice Hall, Upper Saddle River NJ, USA
- [Ebe] J. Eberspächer, H.-J. Vögel: *GSM, Global System for Mobile Communication*. Teubner, Germany
- [Eth] www.ethereal.com, Freeware tool for analysing network protocols
- [EtsiSpec] <http://webapp.etsi.org/key/queryform.asp>: *3GPP Specification for GSM and UMTS*. ETSI.
- [Fre] H. Frey: *Alles über Euro-ISDN*. Franzis, Germany
- [Hal] F. Halsall: *Data communications, computer networks and open systems*. Addison Wesley, USA
- [Hol] H. Holma, A. Toskala: *WCDMA for UMTS*. Wiley & Sons, Chichester, UK
- [Kat] www.kathrein.de/en/sat/tinfos/index.htm → *Television Standards*
- [Kan] A. Kanbach, A. Körber: *ISDN – die Technik*. Hüthig, Heidelberg
- [Kriü] R. Krüger, H. Mellein: *UMTS. Introduction and Measurement*. Rohde&Schwarz, Germany
- [Nob] www.nobbi.com
- [Rau] C. Rauscher: *Fundamentals of Spectrum Analysis*. Rohde&Schwarz, Munich, Germany
- [Red] S. Redl, M.K. Weber: *An Introduction to GSM*. Artech House, Boston, USA
- [Rig] Wolfgang Riggert: *Netzwerktechnologien*. Fachbuchverlag Leipzig, Leipzig, Germany
- [Sie] G. Siegmund: *Technik der Netze*. Hüthig, Heidelberg, Germany
- [Sta] W. Stallings: *Data and Computer Communications*. Prentice Hall, USA
- [Tan] A.S. Tanenbaum: *Computer Networks*. Prentice Hall, USA
- [URep] <http://www.umts-report.de/umts.php>: *Grundlagenserie UMTS*. BörseGo, München, Germany