Lecture 0: Organization

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Contact & Discussions via ISIS:
Course ID 8501

http://www.inet.tu-berlin.de/menue/teaching0/ws201617/wl_1617/
Outline

- General Information
- Organization
- Course Contents and Structure
- Prerequisites
About us: FG INET

- FG INET
  - Internet Network Architectures group
  - Located in MAR on the 4th floor

- Lecturer:
  - Anja Feldmann

- Tutors:
  - Theresa Enghardt
  - Apoorv Shukla
  - Mirko Palmer
About us: BOWL

- Berlin Open Wireless Lab (BOWL) at FG INET
- **Indoor** Testbed
  - 20 nodes
  - On the 4th floor of MAR
  - For smaller or not-ready-to-be-tested-outside experiments
About us: BOWL

- Berlin Open Wireless Lab (BOWL) at FG INET

- Teaching Testbed
  - 20 nodes
  - On the 4th floor of MAR
  - Embedded x86 boards
  - Running OpenWRT
About this course

- Wireless ≠ Wired
- IEEE 802.11 ("Wi-Fi") at different layers
- Not only theoretical, but practical knowledge
- Hands-on assignments

You will:
- Configure Access Points (APs) and clients
- Examine wireless traffic
- Measure and evaluate performance
- Study underlying protocols
Expected take-aways

- Deeper understanding of IEEE 802.11
- Challenges associated with operating Wireless networks
- Hands-on experience
- Measurement of real systems and analysis
About this course: Structure

- **Tutorials** – Highly recommended
  - Thursdays 16-18, MAR 0.017
  - Around 11 lectures + Q&A throughout the semester
  - Assignments are handed out at the time of the tutorial

- **Assignments** – Compulsory
  - 10 in total
  - Duration of 1-2 weeks
  - Solved in teams of 2

- **Oral Exam and Debriefings** – Compulsory
  - Describe or demonstrate your solutions
  - Answer questions

- **There are no certificates just for attending the lectures.**
General Information: Module

- **Module**: MINF-KT-NA/ML.W17
  - “Network Architectures – WirelessLab”
  - **9 ECTS** points = 270 hours of work
  - Please register in QISPOS by November 8th.

- **Grading (Portfolioprüfung)**
  - 10 assignments in total
  - Assignments **01 and 02** together: *Oral exam* on **November 09th/10th**
    - Done **individually**
    - **12/100** of total grade
  - Assignments **03 to 10**: *Worksheets* and *Debriefings*
    - Done **in teams of 2** but graded individually
    - **11 points each = 88/100** of total grade
Assignments

- 10 worksheets
- Handed out on Thursdays in the Tutorials
- Deadline: **Wednesday night at 11.55 pm**, 1 or 2 weeks later. No late submissions.
- Expected workload: **20 hours per worksheet** (+-) 
  After all, this course is 9 ECTS = 270 hours.
- Worksheet 01 and 02 are not graded, but we ask for their contents in the **oral exam**
- Worksheets 03 to 10 are graded after the **debriefing** in the week after the deadline
Assignments

Example general questions:
- How does a wireless station connect to an AP?
- What is RTS/CTS? Why is it needed?
- What effects do PHY and MAC have on higher layers?

Answer these questions by practical experiments on the testbed
- Configure an AP and a client
- Generate traffic between them
- Measure the performance
- Evaluate the results
- Write a report on it
Collaboration

- You solve assignments in groups of 2
- You **must collaborate** with your group partner
- Each student is **graded individually**
- You may distribute tasks, but **know** what the other one has done – **You** may have to explain it in the debriefing
- Each team completes the assignments **independently** from the other groups – No plagiarism, please!
Communication

- ISIS course: ID 8501 (on ISIS)
  - News forum for announcements from us
  - Discussion forum for any questions you have
  - Tutorial Slides
  - Assignment worksheets
  - Upload your solutions

Please use the forums on ISIS for contacting us.
Course Content: Tentative Outline

- **Tools Of The Trade** (Assignments 1-4)
  - Tools for measurement and analysis
  - Statistics and performance evaluation
  - Configuring an Access Point, TCP performance

- **IEEE 802.11** protocol (Assignments 4-7)
  - Lower MAC functionalities (RTS/CTS)
  - Active/Passive measurement
  - Physical properties: Signal Strength, Carrier Sensing
  - Linux rate control
Course Content: Tentative Outline

- **Further Topics** (Assignments 8-10)
  - Wireless (In-)Security
  - Upper MAC (4-way handshake)
  - TCP
  - Current research in our group
Prerequisites

- **Required:**
  - **Networking knowledge** from these courses, or equivalent:
    - Network Protocols and Architectures (by Prof. Feldmann)
    - Telekommunikationsnetze (by Prof. Wolisz)
  - Knowledge of **Linux and the command line**
  - **Shell scripting**
  - **English** language for written assignment reports, debriefings

- **Highly desirable:**
  - Practical networking skills
  - Programming/systems experience
Reading

- Tutorial handouts and reading list in assignments
- HowTos on the Internet
- Scientific Papers
- Book list, also found on the course website
  - We will NOT follow these books, they are only for your information
Now, you have an idea about the course.

Time to think:

**Are you going to take the course?**
- Do you have the time? (~20 hours per worksheet)
- Can you make the commitment?
- Do you have the prerequisites?
  - There is a small quiz to help you evaluate if you have the knowledge.
  - **Not graded**, of course!
And now...

- Please decide if you want to take this course
  - Take your time to think about it.
  - Keep in mind that it's a major time commitment during the semester.
  - On the other hand, there is no exam at the end.
- We have hardware for 8 groups at most.
If you decide to take the course:

- Join the **ISIS course**
- Find a **group partner** by next week – or we will assign one at random.
- **Register** for the module on QISPOS by **November 8th**.
  - Oral exam on November 09th/10th
  - Assignments and debriefings from November 10th on

See you next week 😊