# Operating Systems & Computer Networks

WS 2014/15

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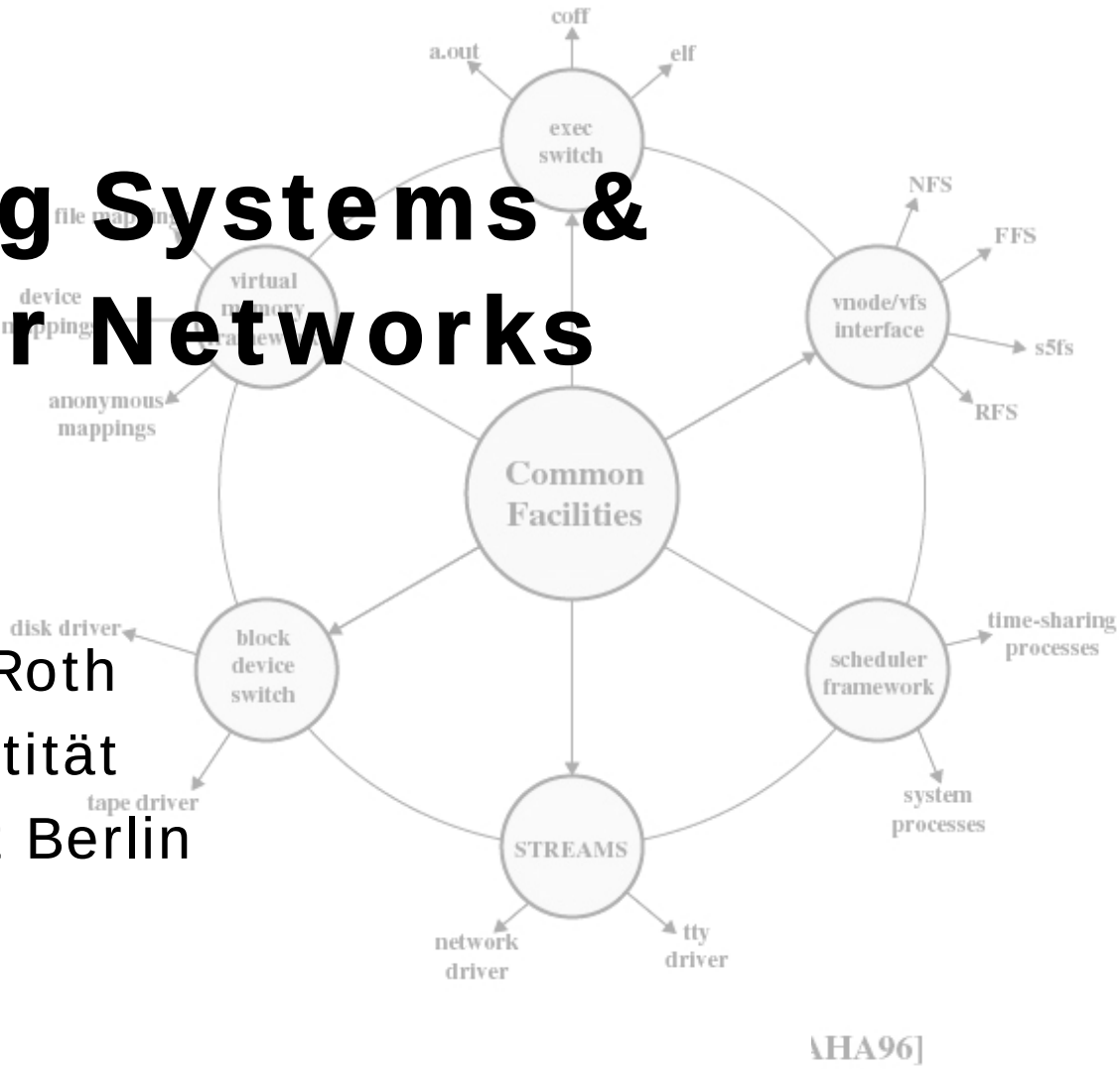
AG Sichere Identität
Freie Universität Berlin



# Structure/content of CST-Lectures

Freie Universität Berlin

**Cryptography**
**Computer Security**
**Seminar IT-Security**
**Seminar Anonymous Comm.**
**Seminar Censorship Resistance**

**Modeling and Simulation**
Modeling, Simulation and Evaluation of Systems

**Praktikum Mobilkommunikation**
Medienzugriff, Mobile IP, Mobiles Web

**Embedded Internet and the IoT**
Wireless sensor networks, wireless mesh networks, Internet of Things, etc.

**Mikroprozessorpraktikum**
Programmierung eingebetteter Systeme, mobile Endgeräte, Mikrocontroller

**Seminar Technische Informatik**
Forschung in Mobilkommunikation, eingebettete Systeme, Internet

**Mobilkommunikation**
Drahtlose Übertragung, Medienzugriff, GSM, 3G, WLAN, Mobile IP, Ad-hoc-Netze, WAP

**Telematik**
Protokolle, Dienste, Standards, LAN, Internet, TCP/IP, WWW, Sicherheit, ISDN/IN/ATM, Dienstgüte, Multimedia, IPv6, MPLS

Master
Bachelor

**Praktikum Technische Informatik (TI IV)**
Eingebettete Systeme, Schnittstellen, Treiber, Betriebssystem, vernetzen, interagieren

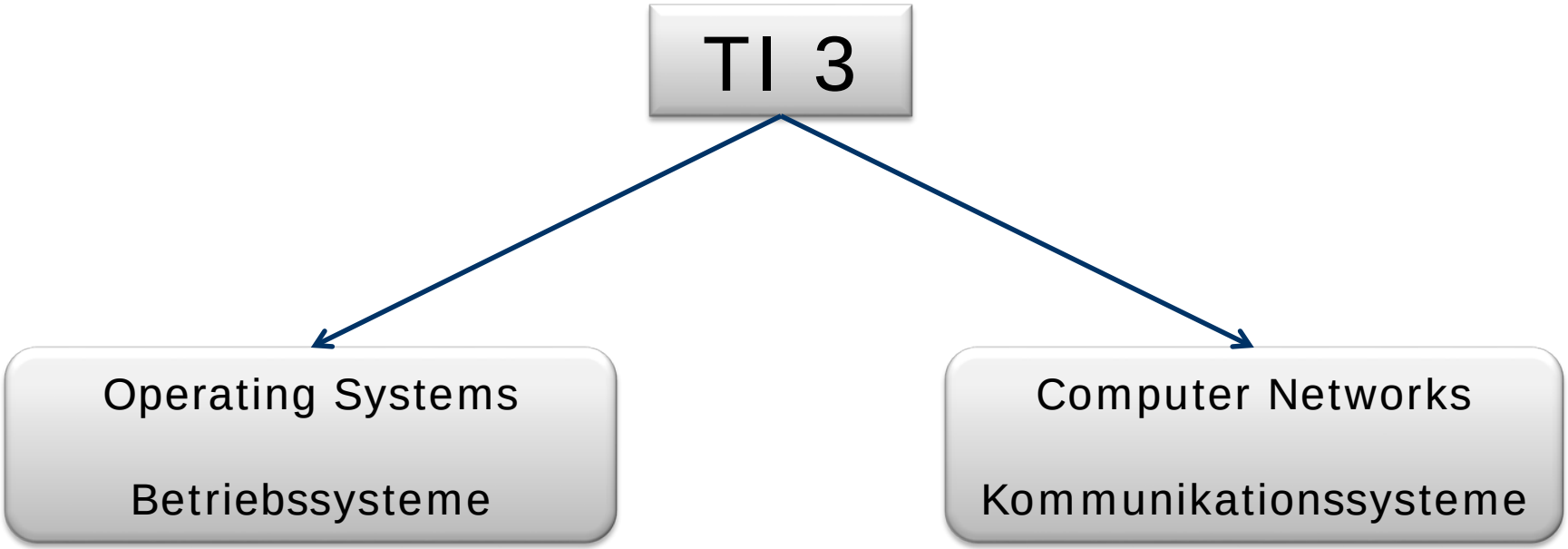
**Betriebs- und Kommunikationssysteme (TI III)**
Ein-/Ausgabe, DMA/PIO, Unterbrechungen, Puffer, Prozesse/Threads, UNIX/Windows, Netze, Medienzugriff, Protokolle, TCP/IP, Internet

You are here!

**Rechnerarchitektur (TI II)**
Harvard/v. Neumann, Mikroarchitektur, RISC/CISC, VLIW, Pipelining, Cache, Speicherhierarchie, Assembler, Multiprozessorsysteme

**Grundlagen der Technischen Informatik (TI I)**
Schaltnetze, Schaltwerke, Logikminimierung, Gatter, Speicher, Halbleiter, Transistoren, CMOS, AD/DA-Umsetzer

# Content


TI 3
Operating Systems
Betriebssysteme
Computer Networks
Kommunikationssysteme

# Content

# Content

8. Networked Computer & Internet
   - Sockets
   - Internet
   - Layers
   - Protocols

9. Host-to-Network I
   - Physical Layer
   - Media
   - Signals
   - Modems

10. Host-to-Network II
    - Data Link Layer
    - Framing, Flow Control
    - Error Detection / Correction
    - Point-to-Point Protocol

11. Host-to-Network III
    - Topologies
    - Medium Access
    - Local Area Networks
      - Ethernet, WLAN

12. Internetworking
    - Switches, Routers
    - Routing
    - Internet Protocol
    - Addressing

13. Transport Layer
    - Protocol Mechanisms
    - TCP, UDP
    - Addressing, Ports

# Content

## 14. Applications

- Domain Name System
- Email
- World Wide Web

## 15. Network Security

- Basic Concepts & Terms
- Cryptology
- Examples
  - Firewalls
  - Virtual Private Networks (VPNs)
  - IP Security
  - Email Security with PGP

## 16. Example

- Under the Hood of Surfing the Web

➢ Programming in C as part of the exercises

# Course Organization

Freie Universität Berlin

## General:

- Lecture
  - Friday, 10-12h, HS, Takustr. 9
- Office Hours
  - Prof. Roth: Tue 18:00-20:00
  - Tutors: during tutorials
- News and Updates
  - Web
- Tutorials
  - Groups of approx. 30 students
  - Time/location depends on group
  - Registration via WWW

## Assignments:

- New assignments each week
  - Available on the web
- Discussion
  - During the tutorials
- Practical assignments
  - Pool computers available
  - More during lecture/tutorials
- Handing in
  - ➢ *Right on time!*
  - Each tutor has his/her own box, 1st floor, Takustr. 9
  - Solutions handed in too late will be ignored!

# Assignments

- Übungsblätter: Available on Fridays in KVV after class
- Submission: Two weeks later until start of class
- Discussion: Two weeks later in tutorials

| 42. Woche | 43. Woche | 44. Woche | 45. Woche |
|---|---|---|---|
| 18.10. Vorlesung 1 | 25.10. Vorlesung 2 | 1.11. Vorlesung 3 | 8.11. Vorlesung 4 |
| Ausgabe Übung 1 | Ausgabe Übung 2 | Ausgabe Übung 3 | Ausgabe Übung 4 |
| Anmeldung zu den Übungsgruppen | ~~Abgabe Übung 1 (bis 10 Uhr)~~ | Abgabe Übung 1 (bis 10 Uhr) | Abgabe Übung 2 (bis 10 Uhr) |
| Keine Übungsgruppen | C-Crashkurs in Übungsgruppen | Besprechung Ü1 in Übungsgruppen | Besprechung Ü2 in Übungsgruppen |

# Criteria for Successful Participation

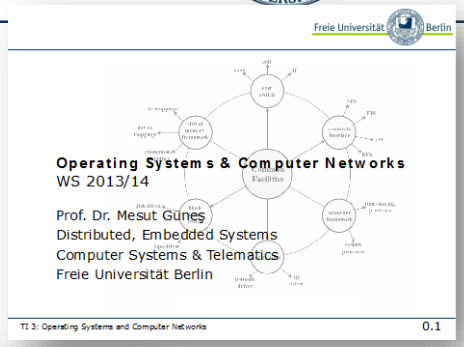
Freie Universität Berlin

- Active participation in the tutorials is essential!
  - Minimum **n-2 times present (not enforced)**
- Hand in your assignments on time
  - Teamwork is required with **2 students** per team
- Successful submission of **assignments** (up to (3,2) points)
- Each student with a correct answer must be able to present the assignment during the tutorials
  - At least **one presentation** during the tutorials
- Exceed point threshold of (1,1) in 2/3 of the cases
- Only the exam counts for grading!
- **Exam: last lecture date in WS14/15!**

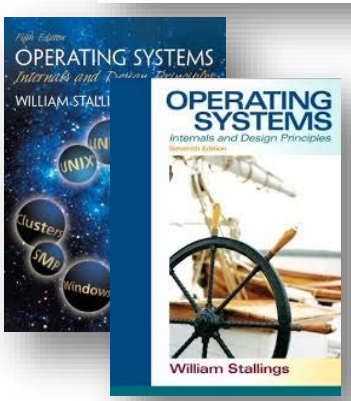
# Literature

- Printouts of the slides
  - Print it yourself or use a laptop, tablet, …

    BUT DO TAKE NOTES!!!




- The course is based on:
  - William Stallings, Operating Systems: Internals and Design Principles, Prentice Hall International
  - Larry L. Peterson, Bruce S. Davie, Computernetze - Eine systemorientierte Einführung, dpunkt Verlag





- Additional literature:
  - Andrew S. Tannenbaum, Modern Operating Systems, Prentice Hall
  - Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Operating System Concepts, John Wiley & Sons