

# Advanced Topics in Networking

Winter

(in German: Advanced Topics in Networking )

**Module-ID: FIN-INF-110513**

| Abbreviation | Credit Points | Semester | Term           | Duration   | Language | Level    |
|--------------|---------------|----------|----------------|------------|----------|----------|
| ATN          | 5             | Winter   | starting at 5. | 1 Semester | english  | Bachelor |

|                                     |                                                                                                                                                                                                                                                                                                         |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Link:</b>                        | <a href="#">LSF</a>                                                                                                                                                                                                                                                                                     |
| <b>Limited accessibility:</b>       | false                                                                                                                                                                                                                                                                                                   |
| <b>Responsibility:</b>              | David Hausheer                                                                                                                                                                                                                                                                                          |
| <b>Lecturer:</b>                    | David Hausheer                                                                                                                                                                                                                                                                                          |
| <b>Classes:</b>                     | <ul style="list-style-type: none"><li>• Lecture <i>Advanced Topics in Networking</i></li><li>• Exercise <i>Advanced Topics in Networking</i></li></ul>                                                                                                                                                  |
| <b>Applicability in curriculum:</b> | <ul style="list-style-type: none"><li>- B.Sc. INF: Informatik - Wahlpflicht</li><li>- B.Sc. CV: Informatik - Wahlpflicht</li><li>- B.Sc. INGINF: Informatik - Wahlpflicht</li><li>- B.Sc. WIF: Gestalten und Anwenden - Wahlpflicht</li><li>- B.Sc. INF (bilingual): Informatik - Wahlpflicht</li></ul> |

## Intended learning outcomes:

Students...

- enhance their competence in the area of networking
- understand advanced networking concepts
- can explain these concepts to other participants

- are able to apply these concepts in theoretical use cases and practical exercises

### Content:

The course deals with advanced topics in the area of networking:

- Overlay networks for content delivery, e.g., P2P, BitTorrent, CDNs, caching, overlay video streaming
- Distributed Hash Tables (DHT), e.g., Kademlia
- Blockchains
- Crypto currencies and Bitcoin
- Ethereum and smart contracts
- Secure network architectures, e.g., SCION
- Congestion Control, e.g., QUIC and Multipath-QUIC

### Workload:

- 28h lectures
- 22h theoretical exercises
- 4h practical exercises
- 96h homework (further studies, preparation for the final exam)

| Pre-examination requirements:                                                                    | Type of examination:     | Teaching method / lecture hours per week (SWS):                                             |
|--------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------|
| Prerequisites for the exam required; details will be announced at the beginning of the semester. | Written exam 120 minutes | <ul style="list-style-type: none"> <li>• Lecture 2 SWS</li> <li>• Exercise 2 SWS</li> </ul> |

| Prerequisites according to examination regulations: | Recommended prerequisites: |
|-----------------------------------------------------|----------------------------|
| none                                                | Modul <i>Computernetze</i> |

| Media: | Literature:                                                   |
|--------|---------------------------------------------------------------|
|        | Textbooks as indicated. Slides and paper copies as necessary. |

### Comments:

In früheren Versionen der Studien- und Prüfungsordnung ist dieses Modul als *WPF Technische Informatik* anrechenbar.

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