

Course Handbook Electrical Engineering and Information Technology Master

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Electrical Engineering and Information Technology Master - mandatory courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
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(0 modules)

Electrical Engineering and Information Technology Master - optional courses (overview)

Module name (EN)	Code	Semester	Hours per semester week / Teaching method	ECTS	Module coordinator
Future Internet: Experimental Networks and Software Defined Networking	E2933	-	4V	5	Prof. Dr. Damian Weber

(1 module)

Electrical Engineering and Information Technology Master - mandatory courses

Electrical Engineering and Information Technology Master - optional courses

Future Internet: Experimental Networks and Software Defined Networking

Module name (EN): Future Internet: Experimental Networks and Software Defined Networking
Degree programme: Electrical Engineering and Information Technology, Master, ASPO 01.04.2019
Module code: E2933
Hours per semester week / Teaching method: 4V (4 hours per week)
ECTS credits: 5
Semester: according to optional course list
Mandatory course: no
Language of instruction: German
Assessment: Written exam/paper
Curricular relevance: E2933 Electrical Engineering and Information Technology, Master, ASPO 01.04.2019, optional course, technical KI759 Computer Science and Communication Systems, Master, ASPO 01.04.2016, semester 1, optional course, informatics specific KIM-FSDN Computer Science and Communication Systems, Master, ASPO 01.10.2017, semester 1, optional course, informatics specific PIM-WI68 Applied Informatics, Master, ASPO 01.10.2011, semester 1, optional course, informatics specific PIM-FSDN Applied Informatics, Master, ASPO 01.10.2017, semester 1, optional course, informatics specific
Workload: 60 class hours (= 45 clock hours) over a 15-week period. The total student study time is 150 hours (equivalent to 5 ECTS credits). There are therefore 105 hours available for class preparation and follow-up work and exam preparation.
Recommended prerequisites (modules): None.
Recommended as prerequisite for:
Module coordinator: Prof. Dr. Damian Weber
Lecturer: Prof. Dr. Damian Weber [updated 08.10.2019]

Learning outcomes:

After successfully completing this course, students will be able to classify all of the consequences of adopting Software Defined Networking (SDN) to the applications development process. Students will be able to assess the impact of SDN for the TCP/IP architecture. They will also be capable of explaining and implementing openflow-based applications. In addition, students will be capable of designing control and monitoring frameworks and writing a concept for a deploying mechanism of such tools using advanced concepts such as federation.

[updated 26.02.2018]

Module content:

1. Networking Architectural Approaches and Issues:
 - Actual IP architecture scenario and new requirements
 - Software Defined Networking (SDN)
 - Architectural issues: naming, addressing, mobility, scalability, autonomy and virtualization
2. OpenFlow Protocol:
 - OpenFlow (OF) architecture
 - OF protocol
 - OF and virtualization
 - OF use cases: virtual router, level 2 virtualization, other
 - OF experimentation with MiniNet (hands-on exercises)
3. Experimental Networks (EN):
 - Experimental Networks principles - user-defined, large and innovative experiments, users, reproducibility, scaling and monitoring:
 - . Experiment (project) requirements
 - . Experiment (project) planning
 - . Experiment (project) execution
 - . Experiment (project) monitoring
 - CMF _ Control and Monitoring Framework _ model and components
 - Experimental network OFELIA (OpenFlow in Europe: Linking Infrastructure and Applications) _ Architecture:
 - components, tools, experimentation facilities, monitoring
 - Experimental Network OMF (Orbit Management Framework) _ Architecture:
 - components, tools, experimentation facilities, monitoring
 - Experimental Network FIBRE EU-BR (Future Internet Testbed Experimentation between Brazil and Europe) _ Architecture:
 - components, tools, experimentation facilities, monitoring
 - Experimental networks monitoring:
 - Architecture, components and issues on monitoring an experiment using an "Experimental Network" (EN)
 - Study case: FIBRE EU-BR I&M Architecture
 - Experimental Networks Federation:
 - . Federation principles
 - . SFA (Slice-based Federation Architecture) approach
 - Experimental Networks "hands-on" exercise:
 - Exercise: create a project/experiment on one of the above experimental networks (OFELIA, OMF or FIBRE)
4. Future Internet - Trends and Scenarios:
 - QoS (Quality of Service) and QoE (Quality of Experience) in FI
 - FI use cases
 - FI research

[updated 26.02.2018]

Recommended or required reading:

[still undocumented]