

## Innovation & Entrepreneurship

(to be combined with a technical major, mandatory for all students)

	I&E	Technical Major
1 <sup>st</sup> Semester	Innovation Management & Entrepreneurship Basics 6 ECTS	19 ECTS
	Electives 5 ECTS	
2 <sup>nd</sup> Semester	Venture Campus – ICT Innovation 9 ECTS	17 ECTS
	Summer School 4 ECTS	
3 <sup>rd</sup> Semester	I&E Study 6 ECTS	24 ECTS
4 <sup>th</sup> Semester		Master Thesis 30 ECTS

### Electives:

Digital Innovation	6 ECTS
Human Side of Innovation	6 ECTS
Innovation Economics	6 ECTS
Innovation Marketing	6 ECTS
Innovation Policy	6 ECTS
Intellectual Property Management	6 ECTS
Open Source and IP in the Digital Society	6 ECTS
Standardisation and Plattform Management	6 ECTS
Strategic Innovation Management	6 ECTS
Strategic Management	6 ECTS

Although the electives all technically have 6 credits, only 5 credits can be counted towards your degree since the I&E Minor only requires 30 credits in total.

### Cloud Computing and Services

Technical Major				
1 <sup>st</sup> Semester	Distributed Algorithms 6 ECTS	Network Architectures - Basics 6 ECTS		Electives 3 ECTS
2 <sup>nd</sup> Semester	Cloud Computing 6 ECTS	Internet of Services Lab 9 ECTS		
3 <sup>rd</sup> Semester	Electives 18 ECTS		Free Choice 6 ECTS	
4 <sup>th</sup> Semester	Master Thesis 30 ECTS			

#### Electives:

5G and IIoT Project	9 ECTS
5G and IIoT Seminar	3 ECTS
5th Generation Mobile Networks	6 ECTS
Advanced Enterprise Computing	6 ECTS
Advanced Information Management 1 (AIM-1) – Heterogeneous and Distributed Information Systems (HDIS)	6 ECTS
Advanced Information Management 3 (AIM-3) – Scalable Data Science: Systems & Methods (SDSSM)	6 ECTS
BDAPRO - Big Data Analytics Project	9 ECTS
Cloud Computing	6 ECTS
Cloud Prototyping	12 ECTS
DBT: Database Technology	6 ECTS
Digital Communities	6 ECTS
Distributed Algorithms	6 ECTS
Enterprise Computing	6 ECTS
Hot Topics in Information Systems Engineering	3 ECTS
IDB-PRA: Implementation of a Database Engine (Database Technology Lab)	6 ECTS
IMPRO - Project Hot Topics in Information Management	6 ECTS
IMSEM – Seminar Hot Topics in Information Management	3 ECTS
Industrial Internet of Things	6 ECTS
Internet of Services Lab	9 ECTS
Mobile Services	6 ECTS
Network Architectures – Basics	6 ECTS
Network Architectures - Router Lab	9 ECTS
Network Architectures - WirelessLab	9 ECTS
Operating System Design	6 ECTS
Performance Evaluation of Computer Communication Systems	6 ECTS

#### Free Choice:

You can choose one or several modules for a total of at least 6 ECTS. These modules can be offered by other departments, i.e. they do not have to be offered by Faculty IV – Electrical Engineering and Computer Science, or other universities (limited to Freie Universität Berlin, Humboldt Universität

Berlin, Universität der Künste Berlin, Universität Potsdam). It is recommendable, though, to choose them from the list of electives (see above) to complete your education within your technical major.

**Electives and Free Choice credits cannot be mixed;** you have to choose modules worth at least 3 ECTS (entry) / 18 ECTS (exit) in the Electives section and at least 6 ECTS in the Free Choice section. It is okay to take a 9 ECTS module for the Free Choice section; however, then the 3 credits above the 6 ECTS requirement for that section will not count towards your degree and they cannot count towards the Electives requirement. This also works the other way around: If you take more than the required number of credits in the Electives section, the extra credits cannot count towards the 6 ECTS Free Choice requirement.

## Data Science

(3<sup>rd</sup> and 4<sup>th</sup> semester at TU Berlin)

Technical Major			
3 <sup>rd</sup> Semester	Advanced Information Management 3 (AIM-3) – Scalable Data Science: Systems and Methods (SDSSM) 6 ECTS	Electives 12 ECTS	Free Choice 6 ECTS
4 <sup>th</sup> Semester	Master Thesis 30 ECTS		

### Electives:

Advanced Information Management 1 (AIM-1) – Heterogeneous and Distributed Information Systems (HDIS)	6 ECTS
Advanced Information Management 2 – Management of Data Streams	6 ECTS
BDAPRO – Big Data Analytics Project	9 ECTS
BDASEM – Big Data Analytics Seminar	3 ECTS
Cloud Computing	6 ECTS
DBT: Database Technology	6 ECTS
IDB-PRA: Implementation of a Database Engine (Database Technology Lab)	6 ECTS
Machine Learning I	6 ECTS
Speech Signal Processing and Speech Technology	6 ECTS

### Free Choice:

You can choose one or several modules for a total of at least 6 ECTS. These modules can be offered by other departments, i.e. they do not have to be offered by Faculty IV – Electrical Engineering and Computer Science, or other universities (limited to Freie Universität Berlin, Humboldt Universität Berlin, Universität der Künste Berlin, Universität Potsdam). It is recommendable, though, to choose them from the list of electives (see above) to complete your education within your technical major.

**Electives and Free Choice credits cannot be mixed;** you have to choose modules worth at least 12 ECTS in the Electives section and at least 6 ECTS in the Free Choice section. It is okay to take a 9 ECTS module for the Free Choice section; however, then the 3 credits above the 6 ECTS requirement for that section will not count towards your degree and they cannot count towards the Electives requirement. This also works the other way around: If you take more than 12 ECTS in the Electives section, the extra credits cannot count towards the 6 ECTS Free Choice requirement.

## Embedded Systems

Technical Major				
1 <sup>st</sup> Semester	Quality Assurance of Embedded Systems 6 ECTS	Embedded Operating Systems 6 ECTS	Compiler Design 6 ECTS	Free Choice 6 ECTS
2 <sup>nd</sup> Semester	Advanced Computer Architectures 6 ECTS		Applied Embedded Systems Project 6 ECTS	
3 <sup>rd</sup> Semester	Electives 18 ECTS		Free Choice 6 ECTS	
4 <sup>th</sup> Semester	Master Thesis 30 ECTS			

### Electives:

Ad-hoc and Sensor Networks	6 ECTS
Analysis and Optimization of Embedded Systems	6 ECTS
Computer Arithmetic: Circuit Perspective	6 ECTS
Embedded Systems Security Lab	6 ECTS
Hot Topics in Operating Systems and Distributed Systems	3 ECTS
Multicore Systems	6 ECTS
Networked Embedded Systems	6 ECTS
Operating Systems Project & Seminar	9 ECTS
Recent Advances in Computer Architecture	3 ECTS
Seminar Software Engineering for Embedded Systems	3 ECTS

### Free Choice:

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**Electives and Free Choice credits cannot be mixed;** you have to choose modules worth at least 18 ECTS (exit) in the Electives section and at least 6 ECTS in the Free Choice section. It is okay to take a 9 ECTS module for the Free Choice section; however, then the 3 credits above the 6 ECTS requirement for that section will not count towards your degree and they cannot count towards the Electives requirement. This also works the other way around: If you take more than the required number of credits in the Electives section, the extra credits cannot count towards the 6 ECTS Free Choice requirement.

## Human Computer Interaction and Design

(3<sup>rd</sup> and 4<sup>th</sup> semester at TU Berlin)

	Technical Major		
3 <sup>rd</sup> Semester	Speech Signal Processing and Speech Technology 6 ECTS	Electives 12 ECTS	Free Choice 6 ECTS
4 <sup>th</sup> Semester	Master Thesis 30 ECTS		

### Electives:

Biometric Identification	3 ECTS
Communication Acoustics	6 ECTS
Computer Graphics Seminar A	3 ECTS
Computer-Supported Interaction	3 ECTS
Digital Image Processing	6 ECTS
Introduction to Physiological Computing	6 ECTS
Photogrammetric Computer Vision	6 ECTS
Project: Statistical Methods in AI and ML	9 ECTS
Study Project Quality and Usability	9 ECTS
Study Project Quality and Usability	6 ECTS
Usable Privacy	3 ECTS

### Free Choice:

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## Internet Technology and Architecture

Technical Major					
1 <sup>st</sup> Semester	Network Architectures – Basics 6 ECTS	5G and IIoT Seminar 3 ECTS	Network Technologies (Small) 6 ECTS	Electives 3 ECTS	Free Choice 6 ECTS
2 <sup>nd</sup> Semester	Mobile Services 6 ECTS	5 <sup>th</sup> Generation Mobile Networks 6 ECTS			
3 <sup>rd</sup> Semester	Electives 18 ECTS		Free Choice 6 ECTS		
4 <sup>th</sup> Semester	Master Thesis 30 ECTS				

### Electives:

5G and IIoT Project	9 ECTS
Ad-hoc and Sensor Networks	6 ECTS
Advanced Algorithmics	9 ECTS
DBT: Database Technology	6 ECTS
Digital Communities	6 ECTS
Embedded Operating Systems	6 ECTS
High-Speed Network Technologies with Lab	6 ECTS
IDB-PRA: Implementation of a Database Engine (Database Technology Lab)	6 ECTS
Master Seminar: Operating Complex IT Systems	3 ECTS
Industrial Internet of Things	6 ECTS
Network Architectures – Master Project	12 ECTS
Network Architectures – Master Project (small)	6 ECTS
Network Architectures – RouterLab	9 ECTS
Network Architectures – Seminar	3 ECTS
Network Architectures – Specialization (big)	9 ECTS
Network Architectures – Specialization (small)	6 ECTS
Network Architectures – WirelessLab	9 ECTS
Network Protocol Programming Lab	6 ECTS
Network Technologies (Medium)	9 ECTS
Network Technologies (Small)	6 ECTS
Networked Embedded Systems	6 ECTS
Operating System Design	6 ECTS
Operating System Project & Seminar	9 ECTS
Parameterized Algorithmics	6 ECTS
Performance Evaluation of Computer Communication Systems	6 ECTS
Project in Advanced Network Technologies	6 ECTS
Special Topics in Communication Networks and Autonomous Security	3 ECTS

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